HAC T-Coil TEST REPORT

No. 2011HAC00024-2

For

TCT Mobile Limited

GSM dual band mobile phone

B11Q US

one touch 585A

With

Hardware Version: PIO

Software Version: V200

FCCID: RAD178

Results Summary: T Category = T3

Issued Date: 2011-07-11

Deutscher Akkreditierungs Rat

No. **DGA-PL-114/01-02**

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of MIIT
No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191.
Tel:+86(0)10-62304633-2079, Fax:+86(0)10-62304793 Email:welcome@emcite.com. www.emcite.com

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No 52, Huayuan beilu, Haidian District, Beijing,P.R.China
Postal Code:	100191
Telephone:	+86-10-62304633
Fax:	+86-10-62304793

1.2 Testing Environment

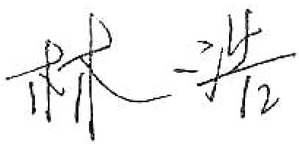
Temperature:	18°C~25 °C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω

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.

1.3 Project Data

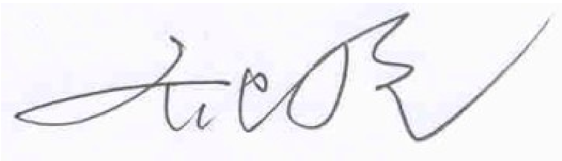
Project Leader:	Qi Dianyuan
Test Engineer:	Lin Hao
Testing Start Date:	June 10, 2011
Testing End Date:	June 10, 2011

1.4 Signature



Lin Hao

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)

Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2 Client Information

2.1 Applicant Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

2.2 Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

3 Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 About EUT

EUT Description:	GSM dual band mobile phone
Model Name:	B11Q US
Marketing Name:	one touch 585A
Frequency Band:	GSM 850/1900

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	012697000221043	PIO	V200

*EUT ID: is used to identify the test sample in the lab internally.

3.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	CAB3120000C1	/	BYD
AE2	Battery	CAB3120000C2	/	Lishen

*AE ID: is used to identify the test sample in the lab internally

4 CONDUCTED OUTPUT POWER MEASUREMENT

4.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure the maximum power transmission and proper modulation. This result contains conducted output power and ERP for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

4.2 Conducted Power

GSM 850MHz	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	32.17	32.22	32.32
GSM 1900MHz	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	29.11	29.51	29.59

5. Reference Documents

5.1Reference Documents for testing

The following document listed in this section is referred for testing.

Reference	Title	Version
ANSI C63.19-2007	American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids	2007 Edition

6 OPERATIONAL CONDITIONS DURING TEST

6.1 HAC MEASUREMENT SET-UP

These measurements are performed using the DASY5 NEO automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Stäubli), robot controller, Intel Core2 computer, near-field probe, probe alignment sensor. The robot is a six-axis industrial robot performing precise movements. A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the HP Intel Core2 1.86 GHz computer with Windows XP system and HAC Measurement Software DASY5 NEO, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

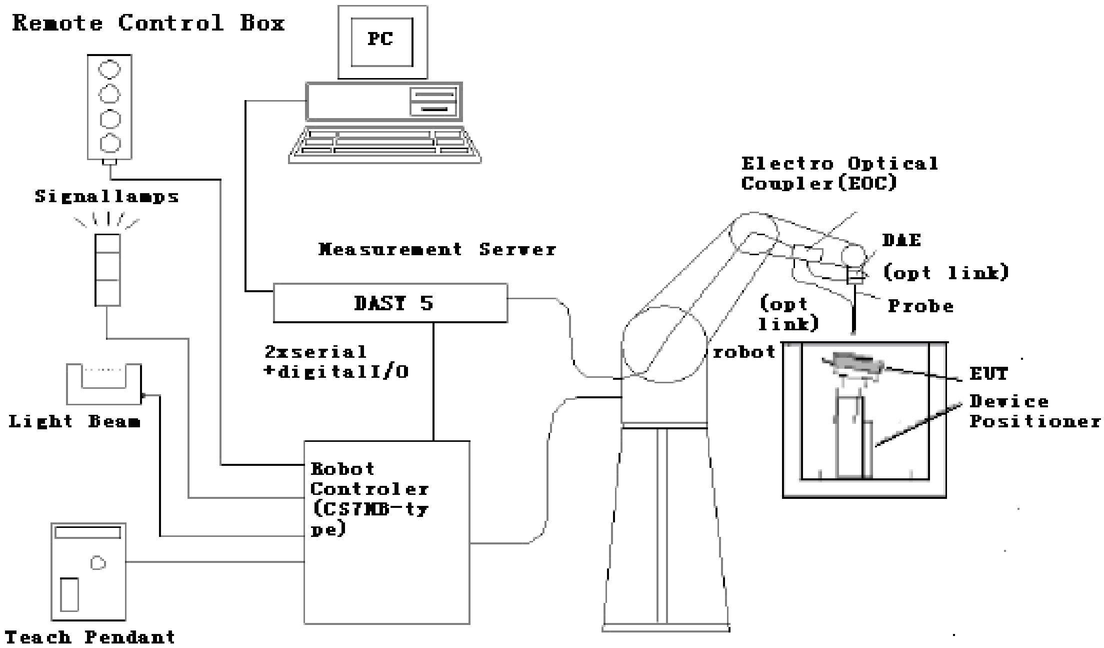


Figure 6.1 HAC Test Measurement Set-up

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

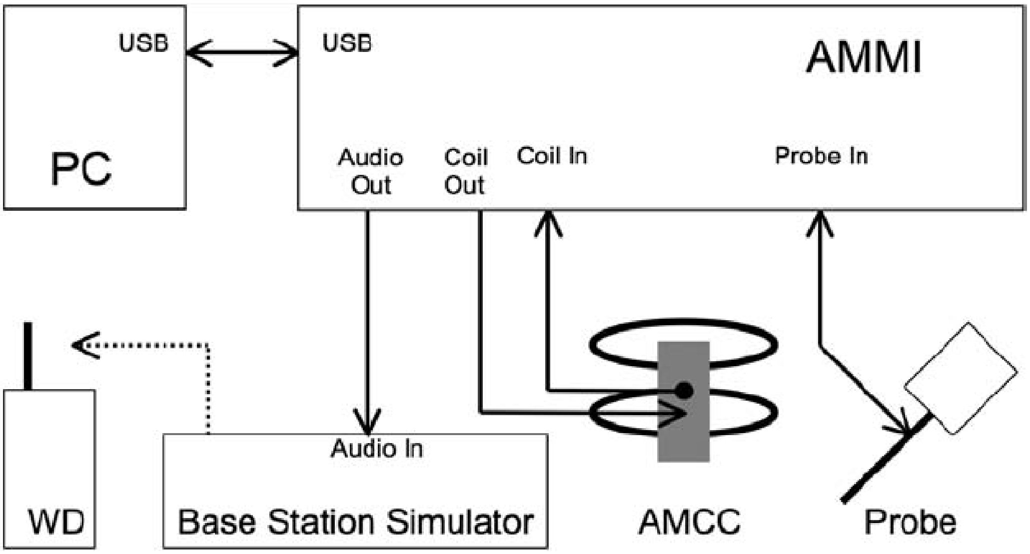


Figure 6.2 T-Coil setup with HAC Test Arch and AMCC

6.2 AM1D probe

The AM1D probe is an active probe with a single sensor. It is fully RF-shielded and has a rounded tip 6mm in diameter incorporating a pickup coil with its center offset 3mm from the tip and the sides. The symmetric signal preamplifier in the probe is fed via the shielded symmetric output cable from the AMMI with a 48V ”phantom” voltage supply. The 7-pin connector on the back in the axis of the probe does not carry any signals. It is mounted to the DAE for the correct orientation of the sensor. If the probe axis is tilted 54.7 degree from the vertical, the sensor is approximately vertical when the signal connector is at the underside of the probe (cable hanging downwards).

Specification:

Frequency range	0.1~20kHz (RF sensitivity < -100dB, fully RF shielded)
Sensitivity	< -50dB A/m @ 1kHz
Pre-amplifier	40dB, symmetric
Dimensions	Tip diameter/length: 6/290mm, sensor according to ANSI-C63.19

6.3 AMCC

The Audio Magnetic Calibration coil is a Helmholtz Coil designed for calibration of the AM1D probe. The two horizontal coils generate a homogeneous magnetic field in the z direction. The DC input resistance is adjusted by a series resistor to approximately 50Ohm, and a shunt resistor of 10Ohm permits monitoring the current with a scale of 1:10

Port description:

Signal	**Connector**	**Resistance**
Coil In	BNC	Typically 50Ohm
Coil Monitor	BNO	10Ohm±1% (100mV corresponding to 1 A/m)

Specification:

Dimensions	370 x 370 x 196 mm, according to ANSI-C63.19

6.4 AMMI

Figure 6.3 AMMI front panel

The Audio Magnetic Measuring Instrument (AMMI) is a desktop 19-inch unit containing a sampling unit, a waveform generator for test and calibration signals, and a USB interface.

Specification:

Sampling rate	48 kHz / 24 bit
Dynamic range	85 dB
Test signal generation	User selectable and predefined (vis PC)
Calibration	Auto-calibration / full system calibration using AMCC with monitor output
Dimensions	482 x 65 x 270 mm

6.5 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 Phone Positioner supports accurate and reliable positioning of any phone with effect on near field <±0.5 dB.

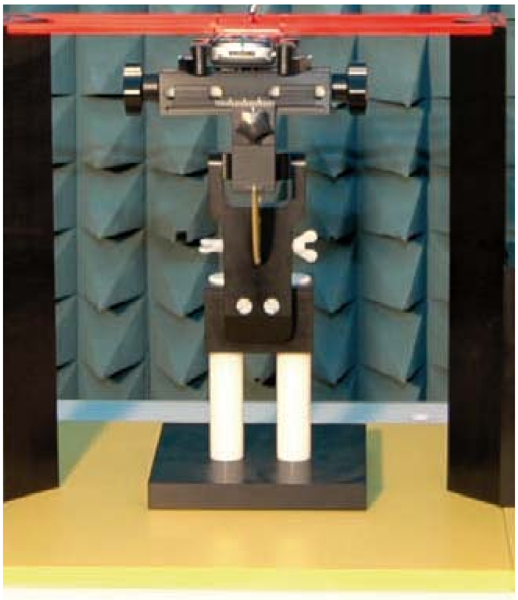


Figure 6.4 HAC Phantom & Device Holder

6.6 Robotic System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX160L
Repeatability: ±0.02 mm
No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller
Processor: Intel Core2
Clock Speed: 1.86 GHz
Operating System: Windows XP
Data Converter
Features: Signal Amplifier, multiplexer, A/D converter, and control logic
Software: DASY5 software
Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock

6.7 T-Coil measurement points and reference plane

Figure 5.5 illustrates the three standard probe orientations. Position 1 is the axial orientation of the probe coil; orientation 2 and orientation 3 are radial orientations. The space between the measurement positions is not fixed. It is recommended that a scan of the WD be done for each probe coil orientation and that the maximum level recorded be used as the reading for that orientation of the probe coil.

1) The reference plane is the planar area that contains the highest point in the area of the phone that normally rests against the user's ear. It is parallel to the centerline of the receiver area of the phone and is defined by the points of the receiver-end of the WD handset, which, in normal handset use, rest against the ear.

2) The measurement plane is parallel to, and 10 mm in front of, the reference plane.

3) The reference axis is normal to the reference plane and passes through the center of the receiver speaker section (or the center of the hole array); or may be centered on a secondary inductive source. The actual location of the measurement point shall be noted in the test report as the measurement reference point.

4) The measurement points may be located where the axial and radial field intensity measurements are optimum with regard to the requirements. However, the measurement points should be near the acoustic output of the WD and shall be located in the same half of the phone as the WD receiver. In a WD handset with a centered receiver and a circularly symmetrical magnetic field, the measurement axis and the reference axis would coincide.

5) The relative spacing of each measurement orientation is not fixed. The axial and two radial orientations should be chosen to select the optimal position.

6) The measurement point for the axial position is located 10 mm from the reference plane on the measurement axis. The actual location of the measurement point shall be noted in test reports and designated as the measurement reference point.

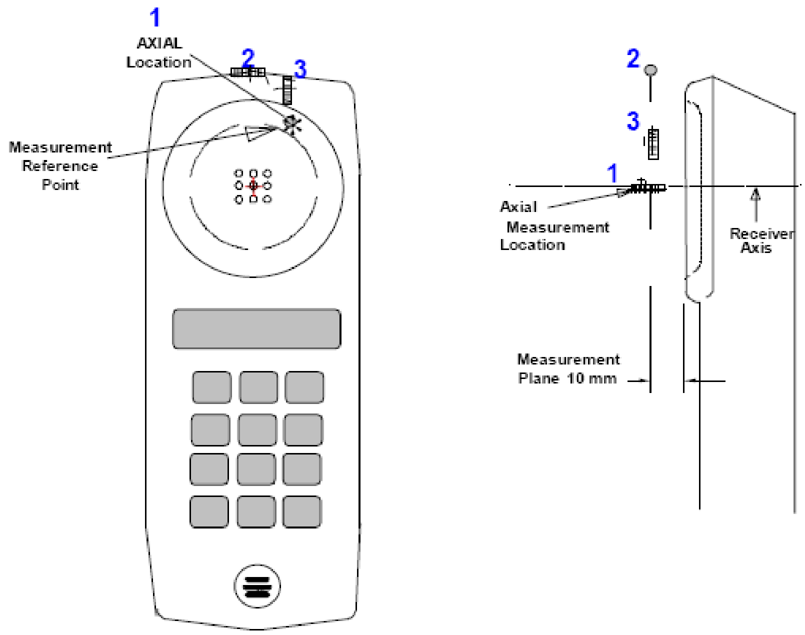


Figure 6.5 Axis and planes for WD audio frequency magnetic field measurements

7 T-Coil TEST PROCEDUERES

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

1) Geometry and signal check: system probe alignment, proper operation of the field probe, probe measurement system, other instrumentation, and the positioning system was confirmed. A surface calibration was performed before each setup change to ensure repeatable spacing and proper maintenance of the measurement plane using the test Arch.

2) Set the reference drive level of signal voice defined in C63.19 per 6.3.2.1.

3) The ambient and test system background noise (dB A/m) was measured as well as ABM2 over the full measurement. The maximum noise level must be at least 10dB below the limit of C63.19 per 7.3.2.

4) The DUT was positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.

5) The DUT operation for maximum rated RF output power was configured and connected by using of coaxial cable connection to the base station simulator at the test channel and other normal operating parameters as intended for the test. The battery was ensured to be fully charged before each test. The center sub-grid was centered over the center of the acoustic output (also audio band magnetic output, if applicable). The DUT audio output was positioned tangent (as physically possible) to the measurement plane.

6) The DUT's RF emission field was eliminated from T-coil results by using a well RF-shielding of the probe, AM1D, and by using of coaxial cable connection to a Base Station Simulator. One test channel was pre-measurement to avoid this possibility.

7) Determined the optimal measurement locations for the DUT by following the three steps, coarse resolution scan, fine resolution scans, and point measurement, as described in C63.19 per 6.3.4.4. At each measurement locations, samples in the measurement window duration were evaluated to

get ABM1 and the signal spectrum. The noise measurement was performed after the scan with the signal, the same happened, just with the voice signal switched off. The ABM2 was calculated from this second scan.

8) All results resulting from a measurement point in a T-Coil job were calculated from the signal samples during this window interval. ABM values were averaged over the sequence of there samples.

9) At an optimal point measurement, the SNR (ABM1/ABM2) was calculated for axial,radial transverse and radial longitudinal orientation, and the frequency response was measured in axial axis.

10) Corrected for the frequency response after the DUT measurement since the DASY5 system had known the spectrum of the input signal by using a reference job.

11) In SEMCAD postprocessing, the spectral points are in addition scaled with the high-pass (half-band) and the A-weighting, bandwidth compensated factor (BWC) and those results are final as shown in this report.

8 T-Coil PERFORMANCE REQUIREMENTS

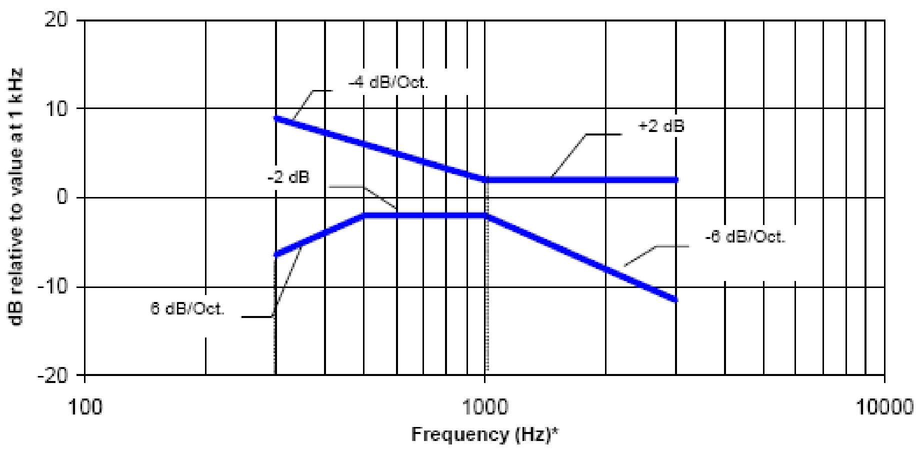
In order to be rated for T-Coil use, a WD shall meet the requirements for signal level and signal quality contained in this part.

8.1 T-Coil coupling field intensity

When measured as specified in ANSI C63.19, the T-Coil signal shall be ≥ –18 dB (A/m) at 1 kHz, in a 1/3 octave band filter for all orientations.

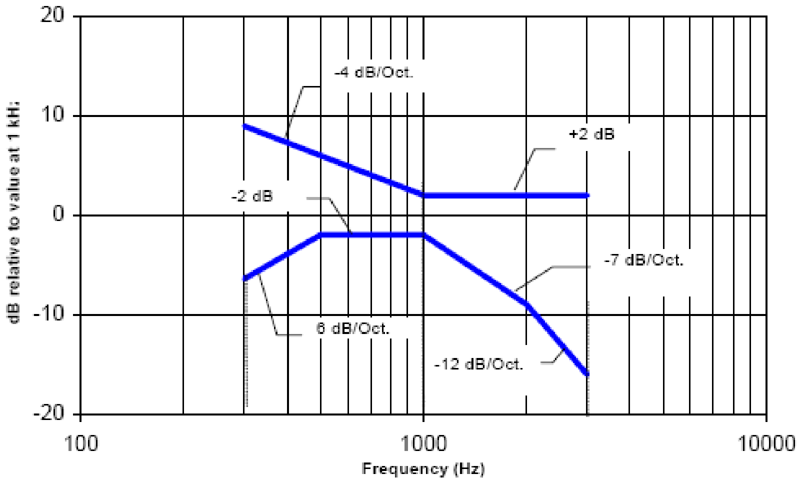
8.2 Frequency response

The frequency response of the axial component of the magnetic field, measured in 1/3 octave bands, shall follow the response curve specified in this sub-clause, over the frequency range 300 Hz to 3000 Hz. Figure 7.1 and Figure 7.2 provide the boundaries for the specified frequency. These response curves are for true field strength measurements of the T-Coil signal. Thus the 6 dB/octave probe response has been corrected from the raw readings.



NOTE—Frequency response is between 300 Hz and 3000 Hz.

Figure 8.1—Magnetic field frequency response for WDs with a field ≤ –15 dB (A/m) at 1 kHz



NOTE—Frequency response is between 300 Hz and 3000 Hz.

Figure 8.2—Magnetic field frequency response for WDs with a field that exceeds –15 dB(A/m) at 1 kHz

8.3 Signal quality

This part provides the signal quality requirement for the intended T-Coil signal from a WD. 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. So, the only criteria that can be measured is the RF immunity in T-Coil mode. This is measured using the same procedure as for the audio coupling mode and at the same levels.

The worst signal quality of the three T-Coil signal measurements shall be used to determine the T-Coil mode category per Table 1

Table 1: T-Coil signal quality categories

Category	Telephone parameters WD signal quality [(signal + noise) – to – noise ratio in decibels]
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

9 HAC T-Coil TEST DATA SUMMARY

9.1 T-Coil Coupling Field Intensity

9.1.1 Axial Field Intensity

Cell Phone Mode	Minimum limit (dB A/m)	Result (dB A/m)	Verdict
GSM 850	-18	2.8	**Pass**
GSM 1900	-18	2.81	**Pass**

9.1.2 Radial Field Intensity

Cell Phone Mode	Minimum limit (dB A/m)	Result (dB A/m)	Verdict
GSM 850	-18	-6.58	**Pass**
GSM 1900	-18	-6.33	**Pass**

9.2 Frequency Response at Axial Measurement Point

Cell Phone Mode	Frequency Response Curve	Verdict
GSM 850	Figure C.1	**Pass**
GSM 1900	Figure C.2	**Pass**

9.3 Signal Quality

Probe Position	Band	Ch.	Measurement Position (x mm, y mm)	ABM1 (dB A/m)	SNR (dB)	T category
Radial 1 (Longitudinal)	**GSM 850**	190	-11.1, -0.6	-5.05	23.2	**T3**
	GSM 1900	661	-10.8, 0.6	-4.87	27.5	**T3**
Radial 2 (Transversal)	**GSM 850**	190	-4.2, -6.3	-6.58	34.1	**T4**
	GSM 1900	661	-4.2, -6.6	-6.33	36.1	**T4**
Axial	**GSM 850**	190	-3.6, -0.8	2.8	24.4	**T3**
	GSM 1900	661	-3.8, -0.6	2.81	28.6	**T3**

Note:

1. The LCD backlight is turn off, Bluetooth function is turn off and volume is adjusted to maximum level during T-Coil testing.
2. Signal strength measurement scan plots are presented in Annex B.

9.4 Total Measurement Conclusion

Probe Position	Frequency Band(MHz)	ABM1	Frequency Response	T Category
Axial	GSM 850	Pass	Pass	T3
	GSM 1900	Pass	Pass	T3
Radial 1	GSM 850	Pass	/	T3
	GSM 1900	Pass		T3
Radial 2	GSM 850	Pass	/	T4
	GSM 1900	Pass		T4

10 MEASUREMENT UNCERTAINTY

No.	Error source	Type	Uncertainty Value a_i (%)	Prob. Dist.	Div.	ABM1 ci	ABM2 ci	Std. Unc. ABM1 u_i' (%)	Std. Unc. ABM2 u_i' (%)
1	System Repeatability	A	0.016	N	1	1	1	0.016	0.016
Probe Sensitivity									
2	Reference Level	B	3.0	R	$\sqrt{3}$	1	1	3.0	3.0
3	AMCC Geometry	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2
4	AMCC Current	B	0.6	R	$\sqrt{3}$	1	1	0.4	0.4
5	Probe Positioning during Calibration	B	0.1	R	$\sqrt{3}$	1	1	0.1	0.1
6	Noise Contribution	B	0.7	R	$\sqrt{3}$	0.0143	1	0.0	0.4
7	Frequency Slope	B	5.9	R	$\sqrt{3}$	0.1	1	0.3	3.5
Probe System									
8	Repeatability / Drift	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
9	Linearity / Dynamic Range	B	0.6	N	1	1	1	0.4	0.4

10	Acoustic Noise	B	1.0	R	$\sqrt{3}$	0.1	1	0.1	0.6
11	Probe Angle	B	2.3	R	$\sqrt{3}$	1	1	1.4	1.4
12	Spectral Processing	B	0.9	R	$\sqrt{3}$	1	1	0.5	0.5
13	Integration Time	B	0.6	N	1	1	5	0.6	3.0
14	Field Distribution	B	0.2	R	$\sqrt{3}$	1	1	0.1	0.1
Test Signal									
15	Ref.Signal Spectral Response	B	0.6	R	$\sqrt{3}$	0	1	0.0	0.4
Positioning									
16	Probe Positioning	B	1.9	R	$\sqrt{3}$	1	1	1.1	1.1
17	Phantom Thickness	B	0.9	R	$\sqrt{3}$	1	1	0.5	0.5
18	DUT Positioning	B	1.9	R	$\sqrt{3}$	1	1	1.1	1.1
External Contributions									
19	RF Interference	B	0.0	R	$\sqrt{3}$	1	0.3	0.0	0.0
20	Test Signal Variation	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2
Combined Std. Uncertainty (ABM Field)		$u_c^{'}=\sqrt{\sum_{i=1}^{20}c_i^2u_i^2}$						4.1	6.1
Expanded Std. Uncertainty		$u_e=2u_c$		N	$k=2$			8.2	12.2

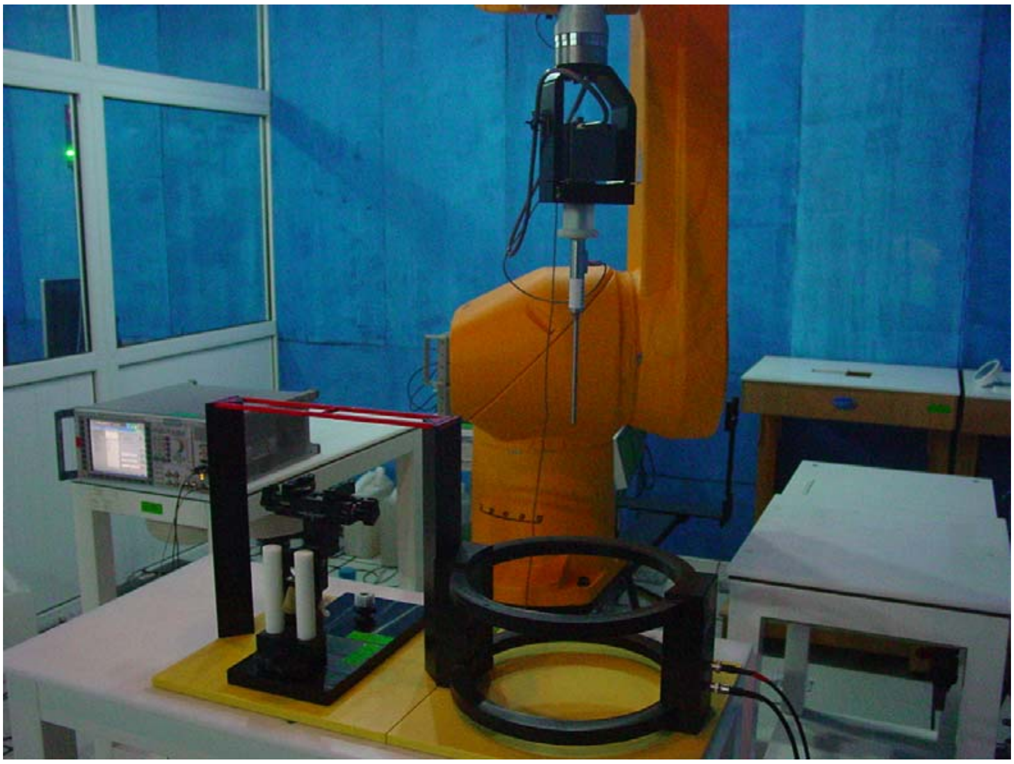
11 MAIN TEST INSTRUMENTS

Table 2: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Audio Magnetic 1D Field Probe	AM1DV2	1064	December 6, 2008	NCR
02	Audio Magnetic Calibration Coil	AMCC	1064	NCR	NCR
03	Audio Measuring Instrument	AMMI	1044	NCR	NCR
04	HAC Test Arch	N/A	1014	NCR	NCR
05	DAE	DAE4	777	July 9, 2010	One year
06	Software	DASY5 V5.0 Build 119.9	N/A	NCR	NCR
07	Software	SEMCAD V13.2 Build 87	N/A	NCR	NCR
08	Universal Radio Communication Tester	CMU 200	105948	August 24, 2010	One year

END OF REPORT BODY

ANNEX A TEST LAYOUT



Picture A1: HAC T-Coil System Layout

ANNEX B TEST PLOTS

T-Coil GSM 850 X longitudinal

Date/Time: 6/10/2011 12:08:09 PM, Date/Time: 6/10/2011 12:38:09 PM
Electronics: DAE4 Sn777
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

x (longitudinal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -4.84 dB A/m
BWC Factor = 0.155979 dB
Location: -10.4, -1.3, 3.7 mm

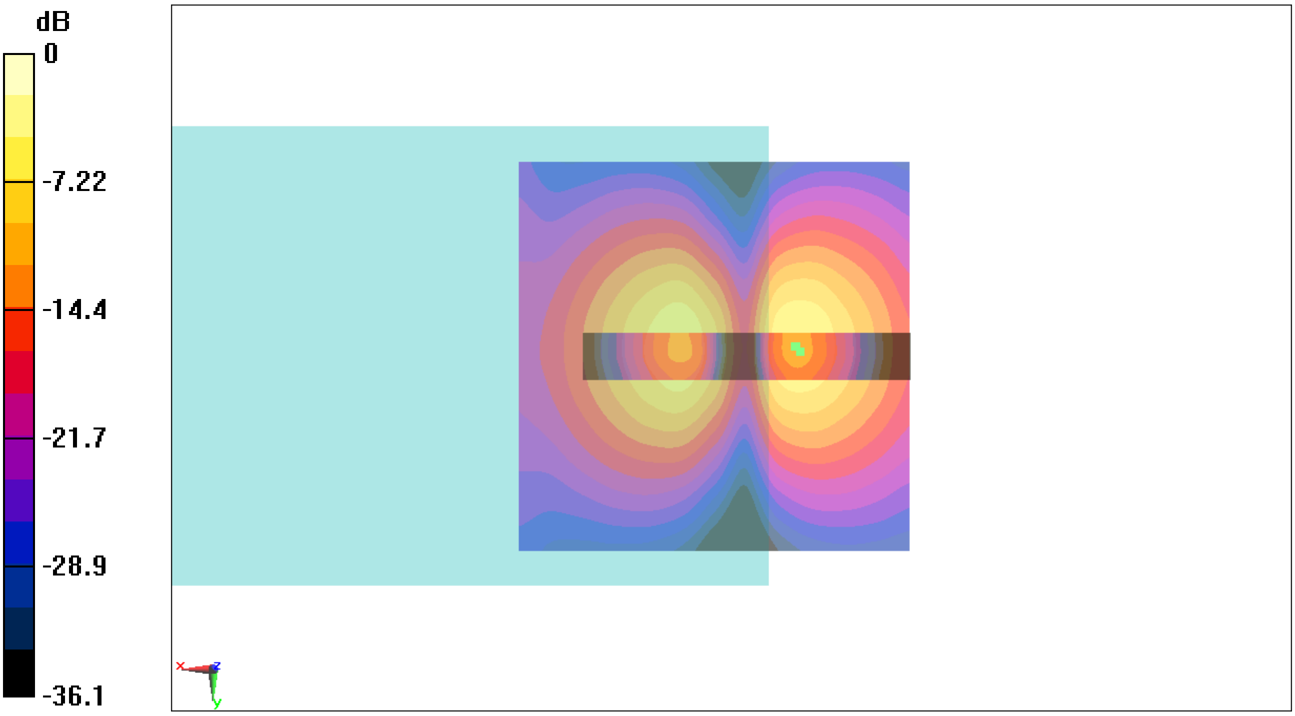
x (longitudinal) fine 3mm 42 x 6/ABM Interpolated Signal(x,y,z) (141x21x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -4.99 dB A/m
BWC Factor = 0.155979 dB
Location: -10.5, -1.2, 3.7 mm

x (longitudinal) fine 3mm 42 x 6/ABM Interpolated SNR(x,y,z) (141x21x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms

BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 23.2 dB
ABM1 comp = -5.05 dB A/m
BWC Factor = 0.155979 dB
Location: -11.1, -0.6, 3.7 mm



0 dB = 1A/m

Fig B.1 T-Coil GSM 850

T-Coil GSM 850 Y transversal

Date/Time: 6/10/2011 12:15:33 PM, Date/Time: 6/10/2011 12:42:12 PM
Electronics: DAE4 Sn777
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

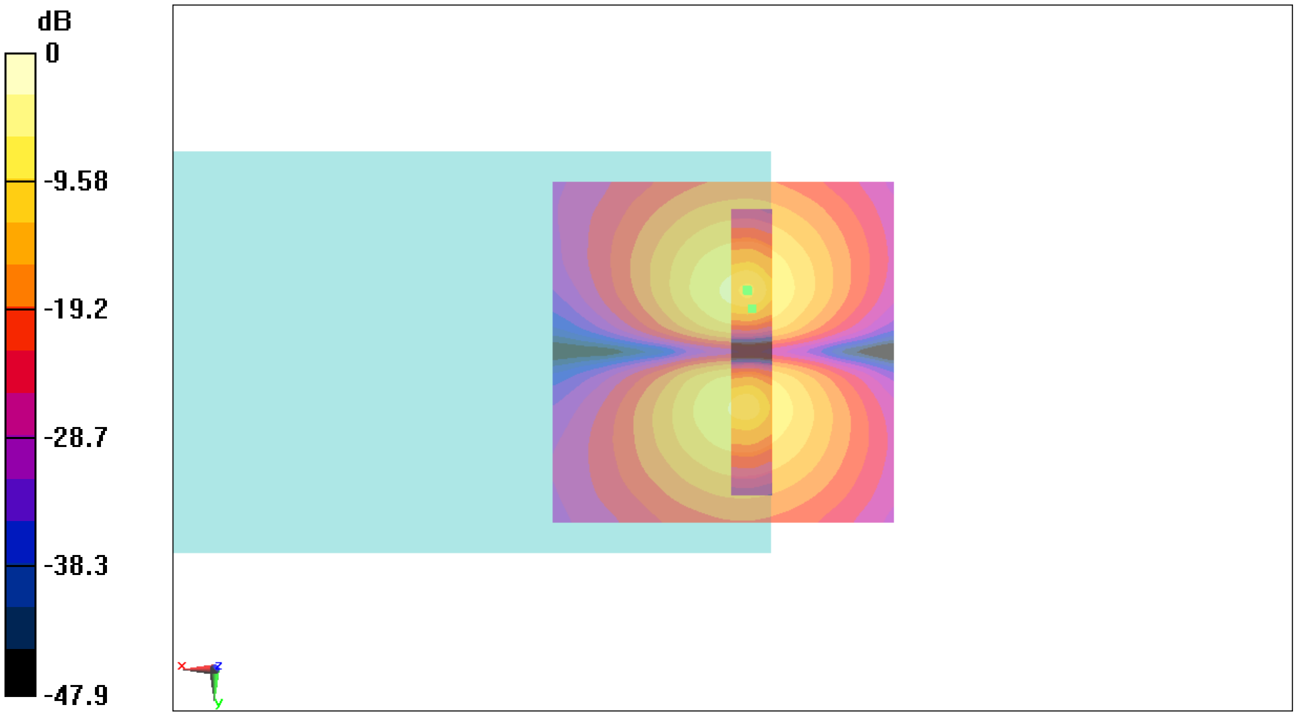
Cursor:
ABM1 = -5.43 dB A/m
BWC Factor = 0.155979 dB
Location: -3.3, -9.2, 3.7 mm

y (transversal) fine 3mm 6 x 42/ABM Interpolated Signal(x,y,z) (21x141x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -5.69 dB A/m
BWC Factor = 0.155979 dB
Location: -3.6, -9, 3.7 mm

y (transversal) fine 3mm 6 x 42/ABM Interpolated SNR(x,y,z) (21x141x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 34.1 dB
ABM1 comp = -6.58 dB A/m
BWC Factor = 0.155979 dB
Location: -4.2, -6.3, 3.7 mm



0 dB = 1A/m

Fig B.2 T-Coil GSM 850

T-Coil GSM 850 Z Axial

Date/Time: 6/10/2011 12:00:45 PM, Date/Time: 6/10/2011 12:35:28 PM
Electronics: DAE4 Sn777
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 34.95
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.73 dB A/m
BWC Factor = 0.155979 dB
Location: -2.9, -0.8, 3.7 mm

z (axial) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.15 dB A/m
BWC Factor = 0.155979 dB
Location: -2.4, -1.2, 3.7 mm

z (axial) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155979 dB
Device Reference Point: 0, 0, -6.3 mm

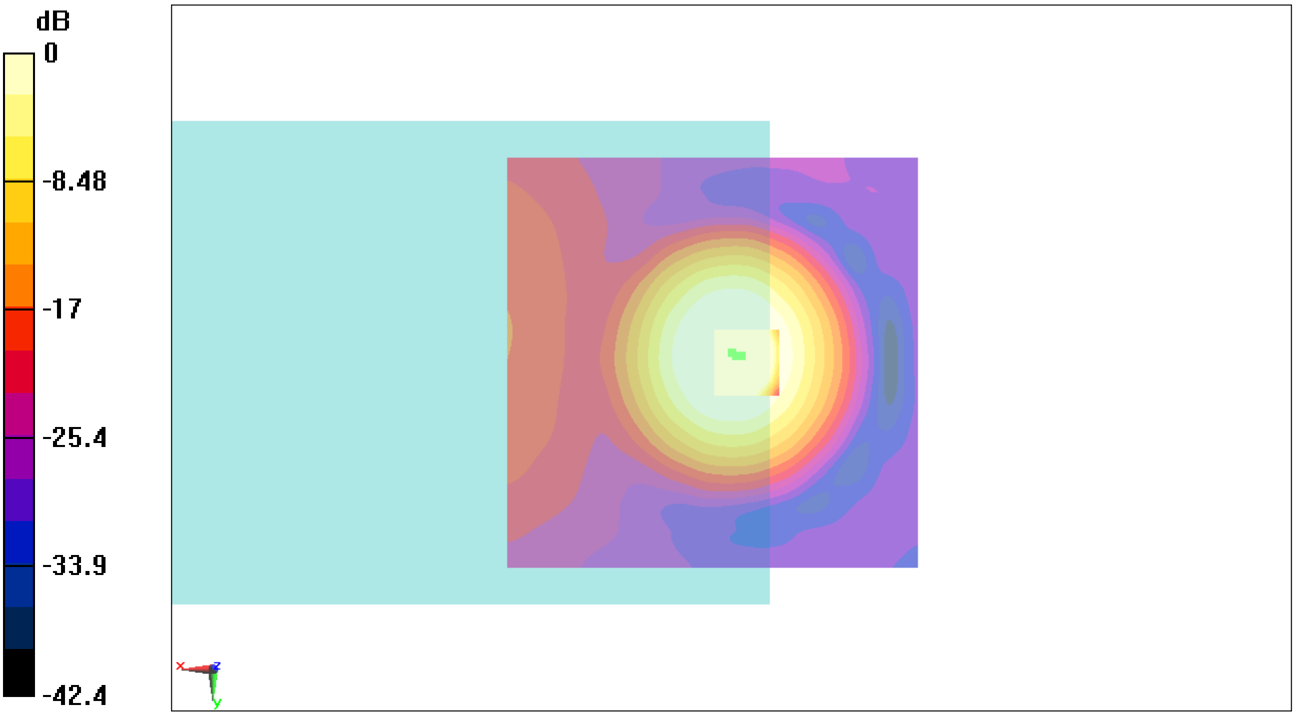
Cursor:

ABM1/ABM2 = 24.4 dB

ABM1 comp = 2.8 dB A/m

BWC Factor = 0.155979 dB

Location: -3.6, -0.8, 3.7 mm



0 dB = 1A/m

Fig B.3 T-Coil GSM 850

T-Coil GSM 1900 X longitudinal

Date/Time: 6/10/2011 12:59:06 PM, Date/Time: 6/10/2011 13:16:48 PM
Electronics: DAE4 Sn777
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

x (longitudinal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

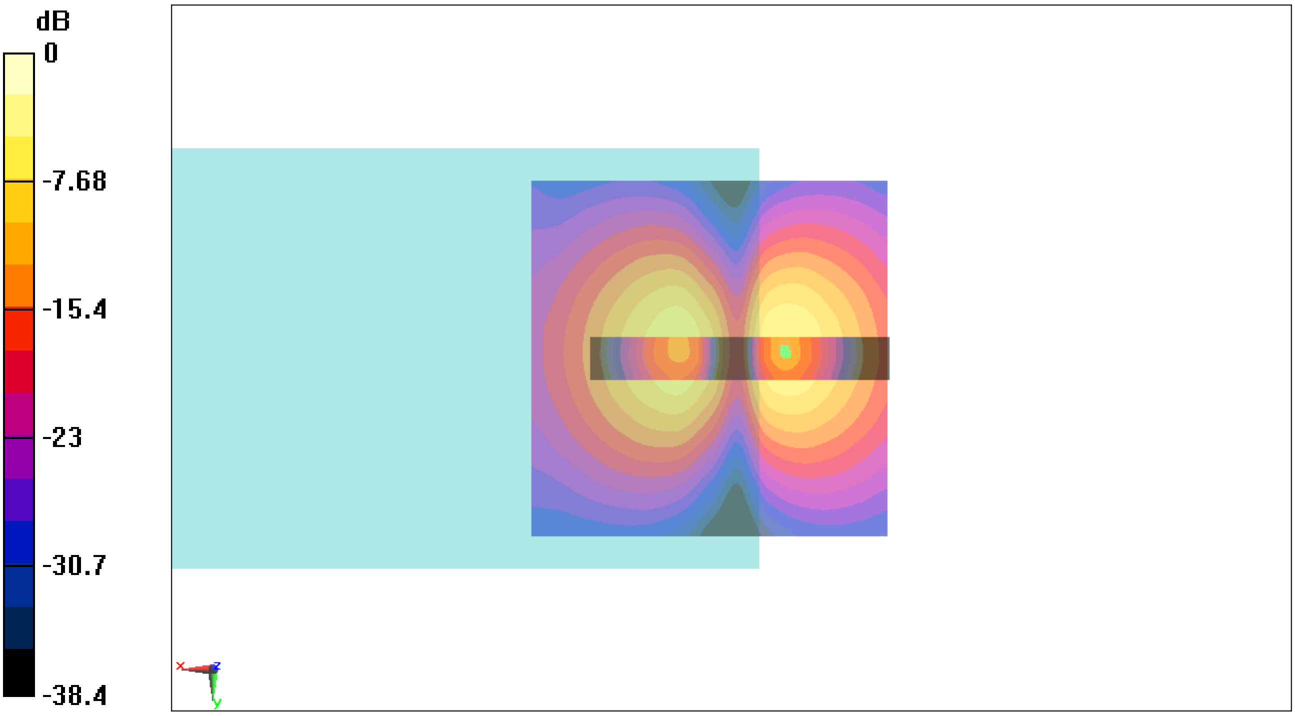
Cursor:
ABM1 = -4.97 dB A/m
BWC Factor = 0.155041 dB
Location: -10.4, -1.3, 3.7 mm

x (longitudinal) fine 3mm 42 x 6/ABM Interpolated Signal(x,y,z) (141x21x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -4.85 dB A/m
BWC Factor = 0.155041 dB
Location: -10.5, -0.9, 3.7 mm

x (longitudinal) fine 3mm 42 x 6/ABM Interpolated SNR(x,y,z) (141x21x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 27.5 dB
ABM1 comp = -4.87 dB A/m
BWC Factor = 0.155041 dB
Location: -10.8, -0.6, 3.7 mm



0 dB = 1A/m

Fig B.4 T-Coil GSM 1900

T-Coil GSM 1900 Y transversal

Date/Time: 6/10/2011 13:06:32 PM, Date/Time: 6/10/2011 13:20:53 PM

Electronics: DAE4 Sn777
Medium: Air
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -5.53 dB A/m
BWC Factor = 0.155041 dB
Location: -3.3, -8.8, 3.7 mm

y (transversal) fine 3mm 6 x 42/ABM Interpolated Signal(x,y,z) (21x141x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -5.58 dB A/m
BWC Factor = 0.155041 dB
Location: -3.6, -9, 3.7 mm

y (transversal) fine 3mm 6 x 42/ABM Interpolated SNR(x,y,z) (21x141x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

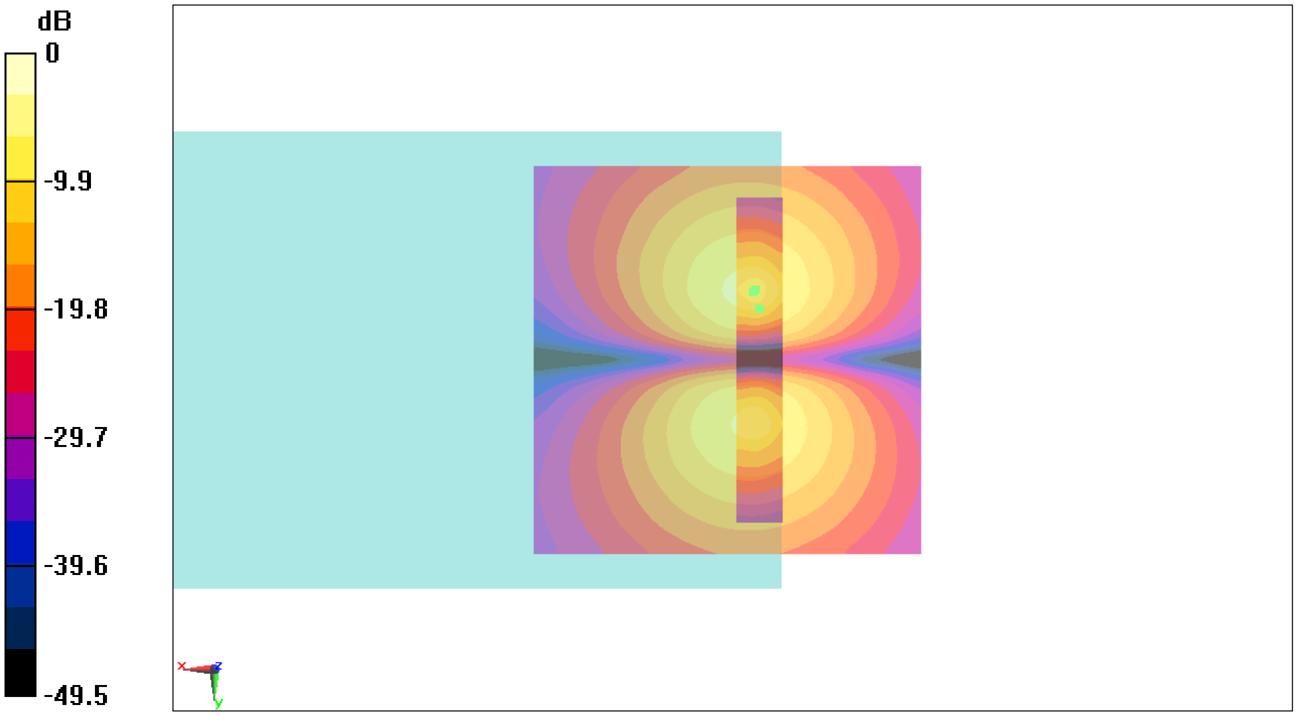
Cursor:

ABM1/ABM2 = 36.1 dB

ABM1 comp = -6.33 dB A/m

BWC Factor = 0.155041 dB

Location: -4.2, -6.6, 3.7 mm



0 dB = 1A/m

Fig B.5 T-Coil GSM 1900

T-Coil GSM 1900 Z Axial

Date/Time: 6/10/2011 12:51:39 PM, Date/Time: 6/10/2011 13:14:02 PM

Electronics: DAE4 Sn777
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 34.95
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.66 dB A/m
BWC Factor = 0.155041 dB
Location: -2.5, -0.8, 3.7 mm

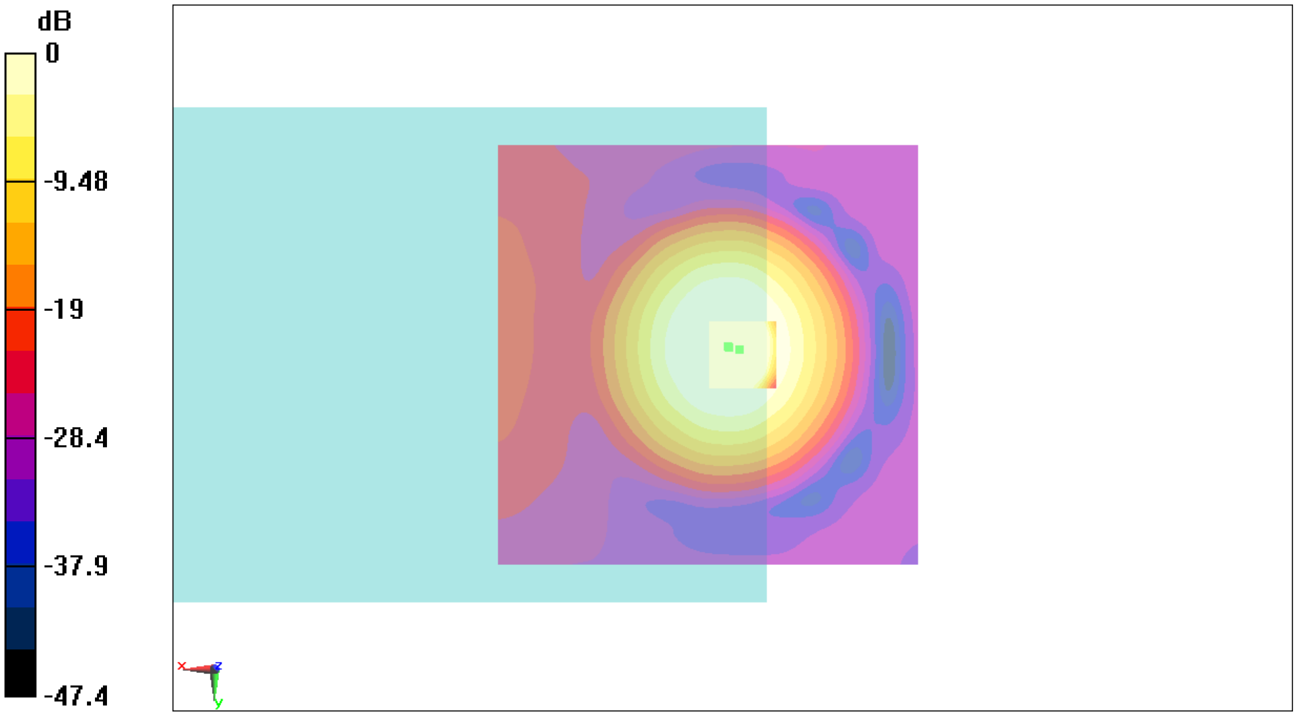
z (axial) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.15 dB A/m
BWC Factor = 0.155041 dB
Location: -2.4, -1, 3.7 mm

z (axial) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):
Measurement grid: dx=10mm, dy=10mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 29.51
Measure Window Start: 0ms
Measure Window Length: 1000ms

BWC applied: 0.155041 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 28.6 dB
ABM1 comp = 2.81 dB A/m
BWC Factor = 0.155041 dB
Location: -3.8, -0.6, 3.7 mm



0 dB = 1A/m

Fig B.6 T-Coil GSM 1900

ANNEX C FREQUENCY REPONSE CURVES

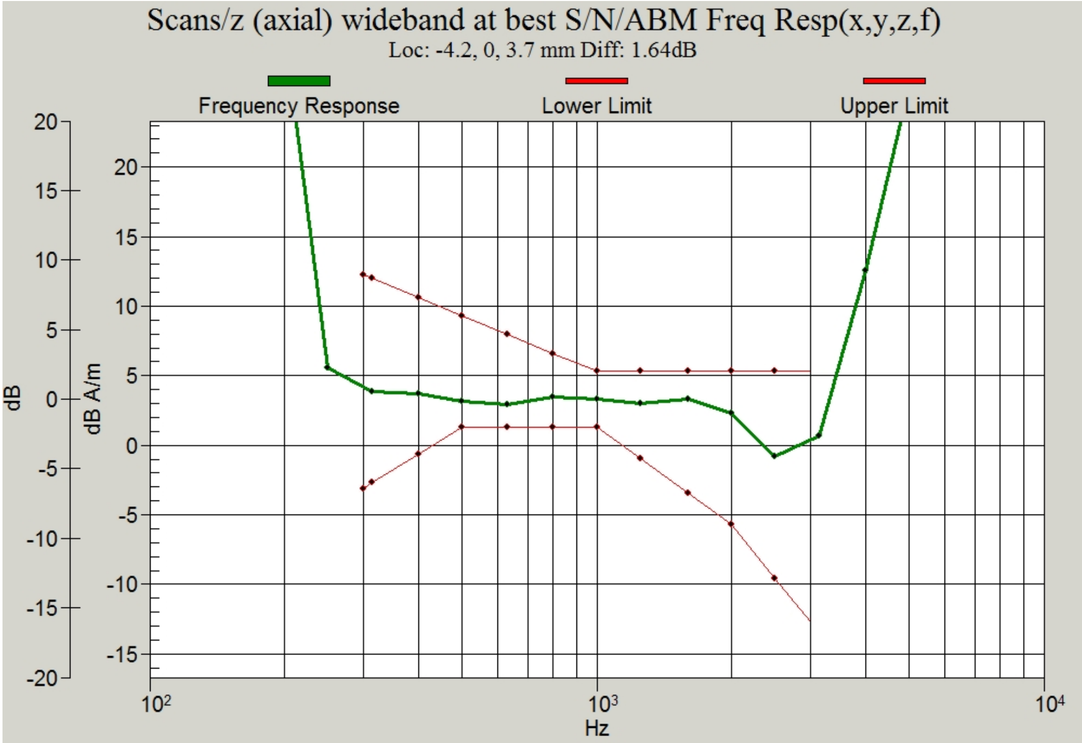


Figure C.1 Frequency Response of GSM 850

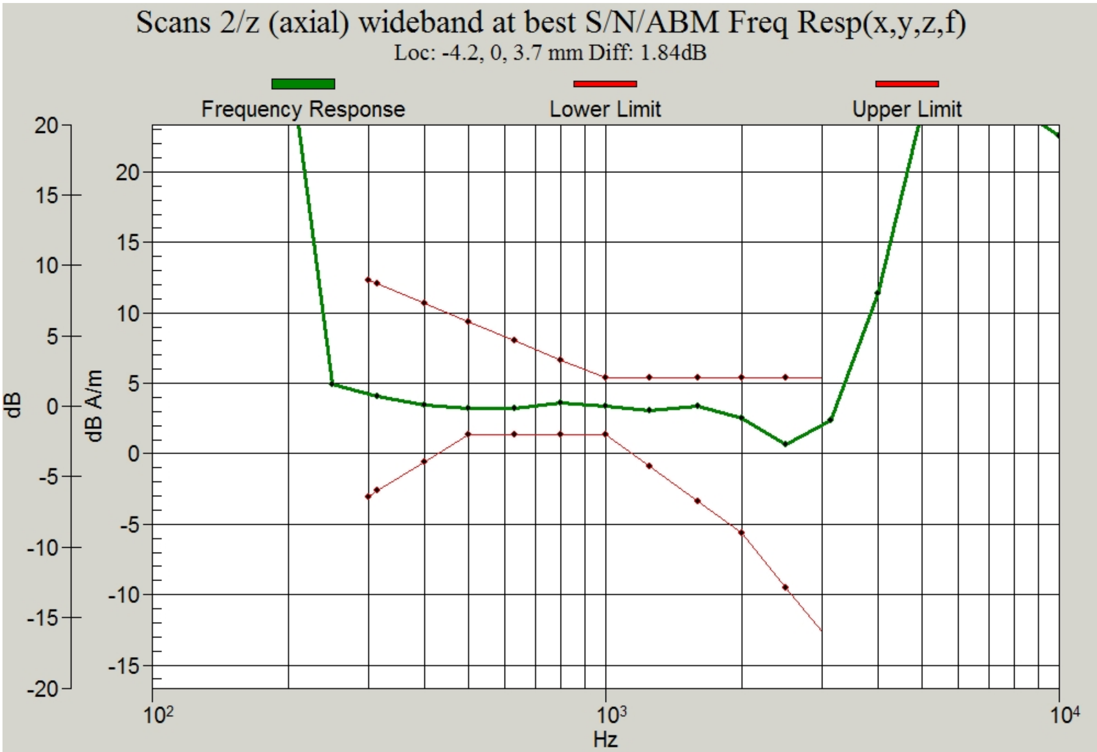


Figure C.2 Frequency Response of GSM 1900

ANNEX D PROBE CALIBRATION CERTIFICATE

Schmid & Partner Engineering AG
s p e a g
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Client TMC

Certificate of test and configuration

Item	**AM1DV2** Audio Magnetic 1D Field Probe
Type No	SP AM1 001 AF
Series No	**1064**
Manufacturer / Origin	Schmid & Partner Engineering AG, Zürich, Switzerland

Description of the item
The Audio Magnetic Field Probe is a fully shielded magnetic field probe for the frequency range from 100 Hz to 20 kHz. The pickup coil is compliant with the dimensional requirements of [1]. The probe includes a symmetric 40dB low noise amplifier for the signal available at the shielded 3 pin connector at the side. Power is supplied via the same connector (phantom power supply) and monitored via the LED near the connector. The 7 pin connector at the end of the probe does not carry any signals, but determines the angle of the sensor when mounted on the DAE. The probe supports mechanical detection of the surface. The single sensor in the probe is arranged in a tilt angle allowing measurement of 3 orthogonal field components when rotating the probe by 120° around its axis. It is aligned with the perpendicular component of the field, if the probe axis is tilted 35.3° above the measurement plane, using the connector rotation and Sensor angle stated below.
The probe is fully RF shielded when operated with the matching signal cable (shielded) and allows measurement of audio magnetic fields in the close vicinity of RF emitting wireless devices according to [1] without additional shielding.

Handling of the item
The probe is manufactured from stainless steel. In order to maintain the performance and calibration of the probe, it must not be opened. The probe is designed for operation in air and shall not be exposed to humidity or liquids. For proper operation of the surface detection and emergency stop functions in the DASY system, the probe must be operated with the special probe cup provided (larger diameter). Verify that the probe can slide in the probe cup rubber smoothly.

Functional test, configuration data and sensitivity
The probe configuration data were evaluated after a functional test including noise level and RF immunity. Connector rotation, sensor angle and sensitivity are specific for this probe.

DASY configuration data for the probe

Configuration item	Condition	Configuration Data	Dimension
Overall length	mounted on DAE in DASY system	296	mm
Tip diameter	at the cylindrical part	6	mm
Sensor offset	center of sensor, from tip	3	mm
Connector rotation	Evaluated in homogeneous 1 kHz magnetic field generated with AMCC Helmholtz Calibration Coil	**- 30.1**	°
Sensor angle		**0.45**	°
Sensitivity	at 1 kHz	**0.0660**	V / (A/m)

Standards
[1] ANSI-C63.19-2007

Test date 6.12.2008 MM

Issue date 17.12.2008

Signature M. Meili FB