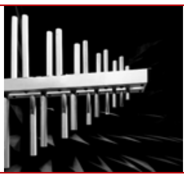
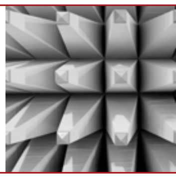
  

CETECOM™

CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test Report No.: 1-6965/13-20-31

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing Laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 – 10
66117 Saarbrücken/Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited Test Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Applicant

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund/SWEDEN

Phone: +46 46 19 30 00

Contact: Mikael Nilsson
e-mail: Micke.nilsson@sonymobile.com
Phone: +46 7 03 22 75 03
Fax: -/-

Manufacturer

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund/SWEDEN

Test Standard/s

ANSI C63.19-2011	Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids
FCC 47 CFR §20.19	Hearing Aid Compatible Mobile Headsets

Test Item

Kind of test item:	Smart Phone
Device type:	portable device
Model name:	**PY7PM-0742**
S/N serial number:	CB5A1Z1Y2X
FCC-ID:	PY7PM-0742
IC:	4170B-PM0742
IMEI-Number:	004402452670411
Hardware status:	AP1.0
Software status:	23.0.E0.81
Frequency:	see technical details
Antenna:	Integrated antenna
Battery option:	Integrated Li-polymer battery 3.7V
Accessories:	---
Test sample status:	identical prototype
HAC T-Coil-Rating	T3

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test Report authorised:

cn=Oleksandr Hnatovskiy, o=CETECOM ICT, ou=HNA-100728, email=Oleksandr.Hnatovskiy@cetecom.com, c=DE
2014.06.23 11:47:42 +02'00'

Oleksandr Hnatovskiy
Testing Manager

Test performed:

Marco Scigliano

cn=Marco Scigliano, o=CETECOM ICT Services GmbH, ou=SCI-120430, email=Marco.Scigliano@Cetecom.com, c=DE
2014.06.23 11:57:14 +02'00'

Marco Scigliano
Expert

1 Table of contents

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.
The testing service provided by CETECOM ICT Services GmbH has been rendered under the current "General Terms and Conditions for CETECOM ICT Services GmbH".
CETECOM ICT Services GmbH will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.
Under no circumstances does the CETECOM ICT Services GmbH test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.
Under no circumstances does the CETECOM ICT Services GmbH test report include or imply any product or service warranties from CETECOM ICT Services GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by CETECOM ICT Services GmbH.
All rights and remedies regarding vendor's products and services for which CETECOM ICT Services GmbH has prepared this test report shall be provided by the party offering such products or services and not by CETECOM ICT Services GmbH.
In no case this test report can be considered as a Letter of Approval.

2.2 Application details

Date of receipt of order:	2014-05-19
Date of receipt of test item:	2014-05-26
Start of test:	2014-06-13
End of test:	2014-06-13
Person(s) present during the test:	

2.3 Statement of compliance

The PY7PM-0742 Smart Phone has been tested in accordance with ANSI C63.19-2011: American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids.

C63.19 HAC Rated Category: T3

2.1 Technical details

Band tested for this test report	Technology	Lowest transmit frequency/MHz	Highest transmit frequency/MHz	Lowest receive Frequency/MHz	Highest receive Frequency/MHz	Kind of modulation	Power Class	Tested power control level	GPRS/EGPRS mobile station class	GPRS/EGPRS multislot class	(E)GPRS voice mode or DTM	Test channel low	Test channel middle	Test channel high	Maximum output power/dBm)*
☐	GSM	880.2	914.8	925.2	959.8	GMSK 8-PSK	4 E2	5	A	33	11	975	37	124	30.0
☐	GSM DCS	1710.2	1784.8	1805.2	1879.8	GMSK 8-PSK	1 E2	0	A	33	11	512	698	885	26.8
☒	GSM cellular	824.2	848.8	869.2	893.8	GMSK 8-PSK	4 E2	5	A	33	11	128	190	251	31.0
☒	GSM PCS	1850.2	1909.8	1930.2	1989.8	GMSK 8-PSK	1 E2	0	A	33	11	512	661	810	25.5
☐	CDMA BC0	815	849	860	894	QPSK	3	max	--	--	--	1013	384	777	24.6
☐	CDMA BC1	1850	1910	1930	1990	QPSK	3	max	--	--	--	25	600	1175	23.5
☐	UMTS FDD I	1922.4	1977.6	2112.4	2167.6	QPSK	3	max	--	--	--	9612	9750	9888	24.5
☒	UMTS FDD II	1852.4	1907.6	1932.4	1987.6	QPSK	3	max	--	--	--	9262	9400	9538	23.5
☒	UMTS FDD V	826.4	846.6	871.4	891.6	QPSK	3	max	--	--	--	4132	4182	4233	24.5
☐	UMTS FDD VIII	882.4	912.6	927.4	957.6	QPSK	3	max	--	--	--	2712	2788	2863	24.5
☐	LTE FDD 2	1850	1910	1930	1990	QPSK	3	max	--	--	--	18700	18900	19100	23.3
☐	LTE FDD 3	1710	1785	1805	1880	QPSK	3	max	--	--	--	19300	19575	19850	23.6
☐	LTE FDD 4	1710	1755	2110	2155	QPSK	3	max	--	--	--	20050	20175	20300	23.5
☐	LTE FDD 7	2500	2570	2620	2690	QPSK	3	max	--	--	--	20850	21100	21350	17.3
☐	LTE FDD 13	777	787	746	756	QPSK	3	max	--	--	--	23205	23230	23255	23.7
☐	WLAN	2412	2472	2412	2472	CCK OFDM	--	max	--	--	--	1	7	13	15.6
☐	WLAN US	2412	2462	2412	2462	CCK OFDM	--	max	--	--	--	1	6	11	15.5
☐	WLAN	5180	5240	5180	5240	OFDM	--	max	--	--	--	--	--	48	15.5
☐	WLAN	5260	5320	5260	5320	OFDM	--	max	--	--	--	--	56	--	12.0
☐	WLAN	5500	5700	5500	5700	OFDM	--	max	--	--	--	--	--	140	11.9
☐	WLAN	5745	5825	5745	5825	OFDM	--	max	--	--	--	--	--	161	13.8
☐	BT	2402	2480	2402	2480	GFSK	3	max	--	--	--	0	39	78	9.2

)*: measured slotted peak power for GSM, averaged max. RMS power for UMTS, LTE, WLAN and BT.

supported UMTS features	category	remarks
Release 9 HSDPA	24	QPSK,16 QAM, 64QAM, 42.2 Mbit/s, Dual-Cell
Release 6 HSUPA	6	no 16QAM , no MIMO, 5.76 Mbit/s

LTE: Release 10, Category 4

2.2 Transmitter and Antenna Operating Configurations

Simultaneous transmission conditions		
GSM / GPRS / EDGE / DTM	+	BT/BLE[1]
GSM / GPRS / EDGE / DTM	+	WLAN 2.4GHz
GSM / GPRS / EDGE / DTM	+	WLAN 5GHz
UMTS / HSPA	+	BT/BLE
UMTS / HSPA	+	WLAN 2.4GHz
UMTS / HSPA	+	WLAN 5GHz
CDMA	+	BT/BLE
CDMA	+	WLAN 2.4GHz
CDMA	+	WLAN 5GHz
LTE	+	BT/BLE
LTE	+	WLAN 2.4GHz
LTE	+	WLAN 5GHz

Table 1: Simultaneous transmission conditions

Note: BT and WLAN can be active at the same time, but only with interleaving of packages switched on board level. That means that they don’t transmit at the same time.

BLE[1] - Bluetooth low energy

Supported modes relevant for HAC testing:

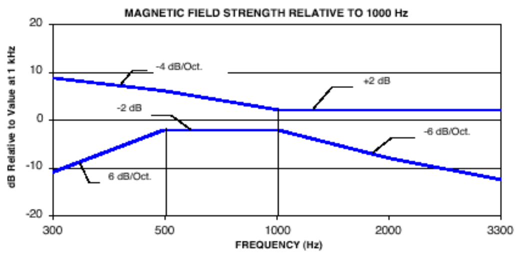
Technology	Frequency band	Transmission	Voice over IP	Tested
GSM	850 MHz	Voice Only	n.a.	x
		Data (GPRS/EDGE)	n.a.	
	1900 MHz	Voice Only	n.a.	x
		Data (GPRS/EDGE)	n.a.	
WCDMA	FDD II 1900 MHz	Voice Only	n.a.	x
		Data (HSPA)	n.a.	
	FDD IV 1700 MHz	Voice Only	n.a.	
		Data (HSPA)	n.a.	
	FDD V 850 MHz	Voice Only	n.a.	x
		Data (HSPA)	n.a.	
LTE	FDD 2 1900 MHz	Voice and Data	X)*	
	FDD 4 1700 MHz	Voice and Data	X)*	
	FDD 5 850 MHz	Voice and Data	X)*	
	FDD 13 700 MHz	Voice and Data	X)*	
	FDD 17 700 MHz	Voice and Data	X)*	
WLAN	2.4 GHz	Voice and Data	X)*	
WLAN	5 GHz	Voice and Data	X)*	
Bluetooth	2.4 GHz	Data		

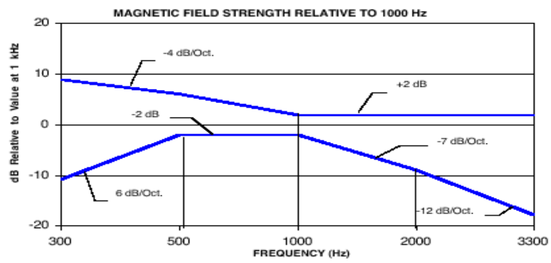
)*
Note: HAC rating was tested only for communication systems offering voice mode in Commercial Mobile Radio Services (CMRS). VoLTE and VoIP over WiFi air interfaces were not tested in accordance with FCC KDB publication 285076D02 (T-Coil testing for CMRS IP).

3 Test standard/s:

Test Standard	Version	Test Standard Description
ANSI C63.19	2011	Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids
FCC 47 CFR §20.19		Hearing Aid Compatible Mobile Headsets

3.1 Categories of hearing aid compatibility for wireless devices

<table>
<tr><td colspan="4">Minimum intensity of magnetic field</td></tr>
<tr><td>axial field intenisity</td><td>>= -18 dBA/m</td><td>radial field intensity</td><td>>= -18 dBA/m</td></tr>
<tr><td colspan="4">Frequency response</td></tr>
<tr><td colspan="4">the frequency response curve shall be within the limits acc. to EIA RS-504-1983</td></tr>
<tr><td colspan="2">

axial field > -10 dBA/m at 1 kHz</td><td colspan="2">

axial field <-10 dBA/m at 1 kHz</td></tr>
<tr><td colspan="4">Signal quality requirement of magnet coupling (SNR)
(This parameter defines the T classification of ANSI C63.19</td></tr>
<tr><td>T 1</td><td colspan="2">0 to 10 dB</td><td></td></tr>
<tr><td>T 2</td><td colspan="2">10 to 20 dB</td><td></td></tr>
<tr><td>T 3</td><td colspan="2">20 to 30 dB</td><td></td></tr>
<tr><td>T 4</td><td colspan="2">> 30 dB</td><td></td></tr>
</table>

4 Summary of Measurement Results

☒	**No deviations from the technical specifications ascertained**
	HAC-Category : T3
☐	Deviations from the technical specifications ascertained

5 Test Environment

Ambient temperature: 20 – 24 °C

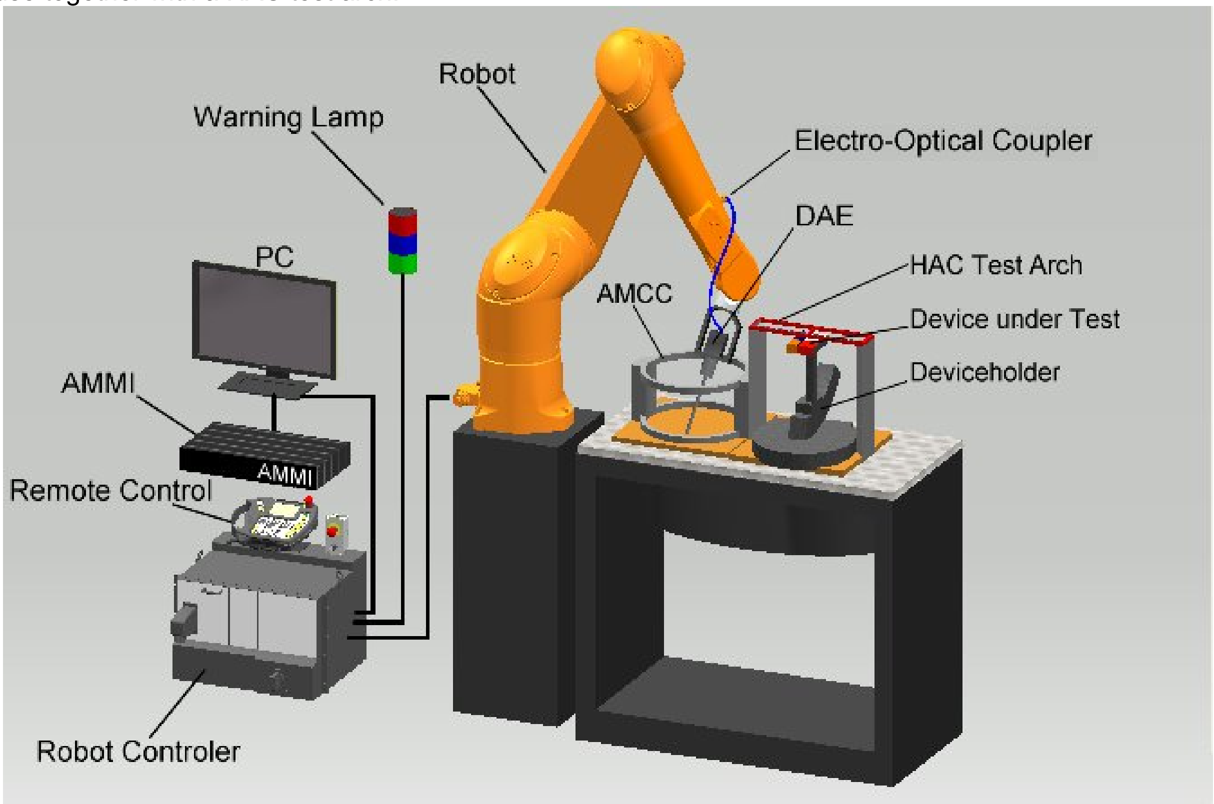
Relative humidity content: 40 – 50 %
Air pressure: not relevant for this kind of testing
Power supply: 230 V / 50 Hz

6 Test Set-up

6.1 Measurement system

6.1.1 System Description

For performing HAC measurements the Schmid & Partner DASY52 dosimetric assessment system is used which is described below. Instead of dosimetric probes E-field and H-field probes for measurement in air are in use together with a HAC test arch:



The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7
- DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

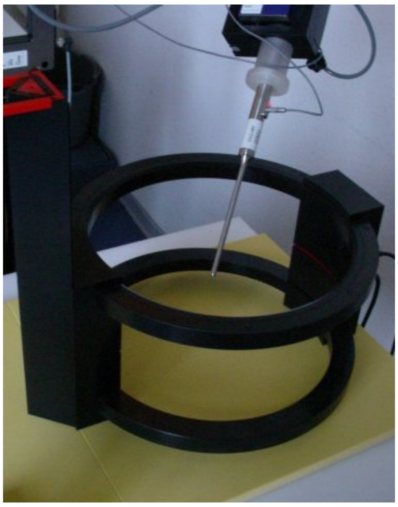
6.1.2 Test environment

The DASY52 measurement system is placed at the head end of a room with dimensions :
5 x 2.5 x 3 m³, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m² array of pyramid absorbers is installed to reduce reflections from the ceiling.
Additional absorbers are placed around the HAC test set-up to prevent reflections from the robot arm.
Picture 1 of the photo documentation shows a complete view of the the test environment.
The system allows the measurement of E-field values larger than 2 V/m and H-field values larger than 10mA/m.

6.1.3 Probe description

Audio magnetic field probe AM1DV2 (Technical data according to manufacturer information)	
Construction	One tilted probe coil is used to measure all three orthogonal field components by rotating the probe.
Calibration	In air using the Audio Magnetic Calibration Coil (AMCC)
Frequency	100 Hz to 20 kHz
Semsitivity	< -50 dBA/m at 1 kHz
Dimensions	Overall length: 296 mm Body diameter: 18 mm; Tip diameter: 6 mm Distance from probe tip to sensor: 3 mm

AMMI description (Technical data according to manufacturer information)	
Construction	desktop unit containing waveform generator, sampling unit and audio volt meter.
data rate	48 KHz / 24 bit
Dynamic range	85 dB
Dimensions	19 mm x 65 mm x 270 mm

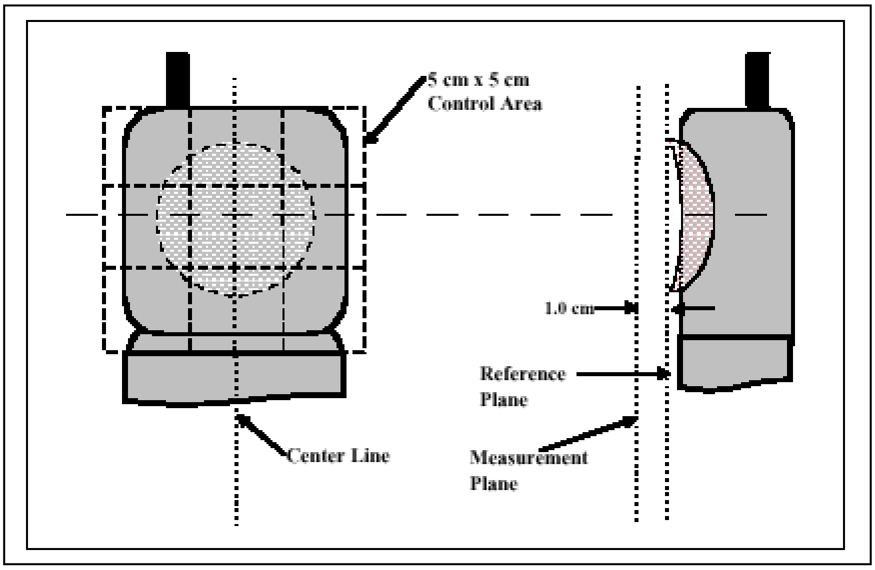


Certificates of conformity for AM1D and AMCC included in the calibration data of this test report show further technical details.

6.1.4 HAC test arch description

The HAC test arch is especially designed for performing measurements according to the requirements of ANSI C63.19. It allows centering the wireless device inside a 5 x 5 cm control area marked with 4 points for position adjustment. Plastic bridges allow an exact adjustment of the measurement distance to 1 cm from the DUT, which also includes the distance of the dipole center to the probe tip.
For centering the mobile phone speaker inside the control area and for adjusting the validation dipole position the test arch contains a nylon thread for alignment (see picture).

The HAC test arch is placed on the cover of the DASY52 SAM phantom.



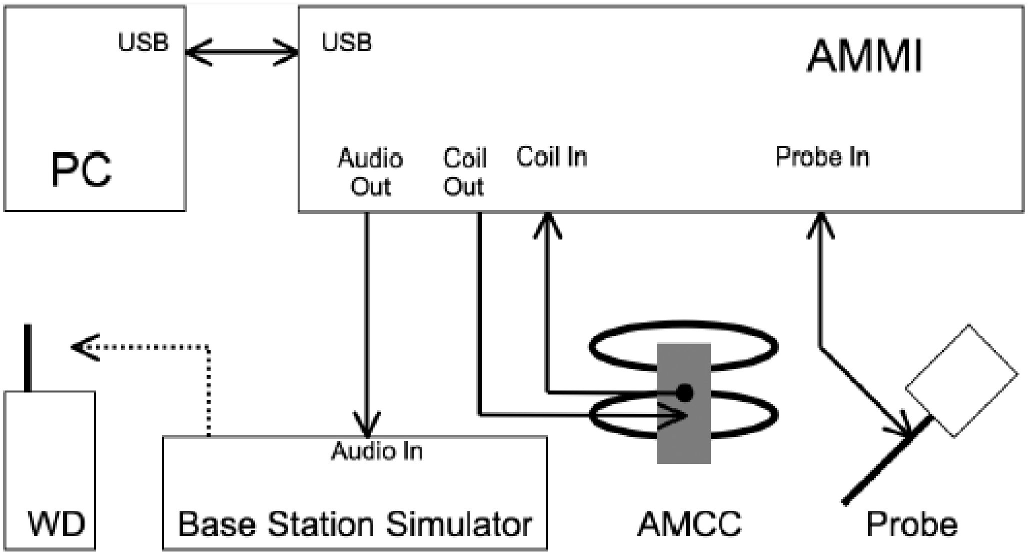
6.1.5 Device holder description

The DASY5 device holder (see picture above) has three scales for device inclination, height and side adjustment. The device holder position is adjusted to the standard measurement position e.g. center of the DUT speaker to the center of the 5 x 5 cm² control area with the device touching the plastic bridge of the HAC test arch. This device holder is used for standard mobile phones or PDA’s only. If necessary an additional support of polystyrene material is used.

6.1.6 Test set-up procedure

The DASY52 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All tests are performed with the same configuration of test steps an in accordance with the requirements described in C63.19-2011.

Before starting the measurement cabling of test set-up needs to be verified according to the following description :



WD = Wireless device

The AMMI is used to generate audio test signals via ‘Audio Out’ and ‘Coil Out’ as well as measuring audio levels via ‘Coil In’ and ‘Probe In’.

At the beginning of the measurement a probe calibration is performed inside the AMCC Helmholtz coil. Frequency response and sensitivity are measured and can be compared with coil monitoring signal measured at ‘Coil in’. See annex 1 for details.
These data are used as a reference during the following audio magnetic field measurements with the DUT.

Next step is the signal verification.
According to ANSI C63.19-2011 an audio input level of -16 dBm0 for GSM or WCDMA needs to be generated at the DUT. Audio speech codec option of CMU 200 offers different calibration procedures for adjusting the audio output level of the AMMI to the required level, which is described by the following routine recommended by SPEAG:

Audio Out of AMMI is connected to Speech codec handset in (9-pin connector) at CMU
Speech codec ‘handset out’ is connected to ‘Coil in’ of AMMI which can be used as audio volt meter after calibration.
Audio calibration requires setting up a call to the wireless device.
‘Decoder Cal’ at CMU is selected. This generates a 1 kHz sine with a level of 3.14 dBm0 at ‘Handset Out’.
A measurement of the ‘Coil In signal’ is started, which is the CMU output signal now. The measured dBV value corresponds to 3.14dBm0 and the required value in dBV for -16 dBm0 can be calculated
A 1 kHz sine signal with AMMI gain value 10 is continuously generated by the AMMI.
‘Codec Cal’ is selected at the CMU. The input signal at the CMU is now sent back to AMMI input.
Measurement of ‘Coil In Signal’. The measured dBV value corresponds to the gain value of 10 and the required gain value for -16 dBm0 can be calculated.
‘Speech codec handset low’ is selected at the CMU for measuring the audio output of the wireless device.

Compared to the 1 kHz sine any other selected audio signal requires different gain settings as those signals have a different peak-to-RMS ratio. The correction factors for the gain setting can be determined by directly connecting 'Audio Out' to 'Coil In' and measuring the signal levels.

CMU200 decoder calibration is device specific and needs to be performed after each re-calibration and adjustment.

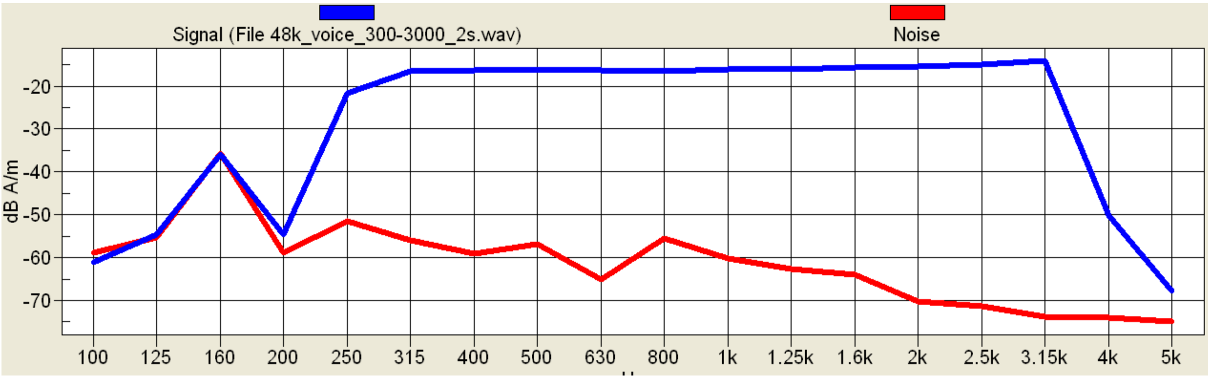
For CMU200 S/N 106826 the following values have been determined:

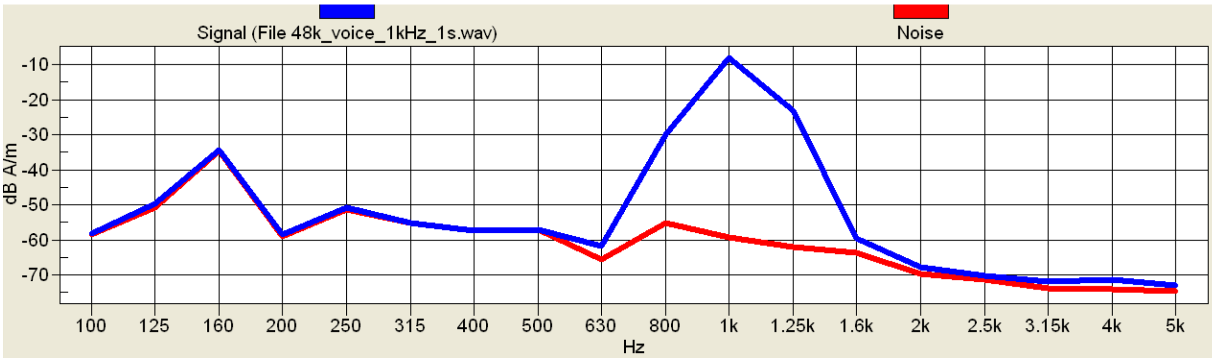
3.14 dBm0 corresponds to -2.57 dBV → -16 dBm0 = -21.71 dBV
gain 10 corresponds to 20.6 dBV → required gain setting for -21.71 dbV and 1 kHz sine : 8.2

gain settings for different signal types used in this report :

Signal	Duration	Peak to RMS [dB]	RMS [dB]	required gain factor	gain setting
1 kHz sine	---	3.0	0.0	1.0	8.2
48k voice 1kHz	1 s	16.2	-12.7	4.33	35.3
48k voice 300 – 3000 Hz	2 s	21.6	-18.6	8.48	69.3

Broadband signal and narrowband signal compared to noise level:





6.1.7 HAC T-Coil measurement procedure

- The HAC test setup including AMCC is placed at the pre-defined position on top of the SAR phantom cover.
- A phantom adjustment and verification is performed, which allows checking the borders and centre position of the 5 x 5 cm² control area. The probe tip touches down on the 4 points at the corners of the control area.
- The probe distance of 0.7 mm to the test arch is calibrated by using the manual robot control. The corresponding robot settings and instructions are included in the pre-defined measurement files.
- A probe calibration is performed with a calibration signal and a broadband voice signal to check frequency response.
- A background noise check is performed inside AMCC and in test position with DUT removed.
- The wireless device (WD) is oriented in its intended test position (see photo documentation) with the reference plane in the horizontal plane and secured by the device holder. The acoustical output is placed in the centre of the control area (predefined by the HAC test arch).
- DUT is switched on and call is initiated at maximum RF output power, with T-Coil active at maximum volume. Additionally settings causing additional noise to T-Coil connection (e.g. backlight on) can be tested.
- A course scan for axial and longitudinal magnetic field at 50 x 50 mm with 4.2 mm spacing is performed with a narrowband voice signal at 1 kHz and with noise only at a distance of 0.7 mm above the HAC test arch.
- At the position of best SNR in course scans a fine scan of 8 x 8 mm at 2 mm spacing is performed with a narrowband voice signal and noise only. Steps 8 and 9 are performed for all 3 probe orientations (axial, longitudinal transversal).
- At the position with best SNR in fine scan of the axial component a broadband voice measurement is performed to determine the frequency response.

6.1.8 Signal flow of ABM1 and ABM2 measurements

ABM1:

Magnetic field probe AM1D delivers a voltage corresponding to a certain magnetic field intensity. This signal is amplified by 40 dB and measured by the AMMI. The measured value is corrected by the probe sensitivity factor (e.g. -32 dBV/(A/m)) for the measured frequency as determined during probe calibration, as well as by the 40 dB pre-amplification.
After filtering the signal by a 1/3 octave filter the ABM1 value for magnetic field intensity is obtained.

ABM2:

ABM2 is measured by turning the audio signal off and measuring noise. The measured noise level is corrected as above and is additionally filtered using half band integration and A-weighting filters by applying convolution in time-domain. ABM2 is obtained as the power sum inside the 0.1 to 10 kHz band.

6.1.9 Test data evaluation

- ABM1, ABM2 and ABM1/ABM2 (SNR) can be evaluated with the SEMCAD post processor. Values for each measurement position can be read directly by using a cursor.
All values can be displayed in dB (A/m). Therefore one of the three values can be derived from the two others by using the formula SNR = ABM1 – ABM2

- Frequency response from 300 to 3000 Hz can be evaluated from z-axis frequency response measurement and can be compared to limit lines which depend on the signal level at 1 kHz according to ANSI C63.19 chapter 8.3.

For details about ABM1 and SNR see annex A.2. Section 7 summarizes the test results.
Test procedures and data evaluation are referred to ANSI-C63.19-2011.

6.1.10 Measurement uncertainty evaluation for HAC T-Coil measurements

This measurement uncertainty budget is suggested by ANSI-C63.19 and determined by Schmid & Partner Engineering AG. It is valid for the frequency range 800 MHz – 3 GHz and represents a worst case analysis. The breakdown of the individual uncertainties is as follows:

Error Sources	**Uncertainty Value**	**Probability Distribution**	**Divi -sor**	**c_i ABM1**	**c_i ABM2**	**Standard Uncertainty ABM1**	**Standard Uncertainty ABM2**
Probe Sensitivity							
Reference level	± 3.0%	Normal	1	1	1	± 3.0%	± 3.0%
AMCC geometry	± 0.4%	Rectangular	√3	1	1	± 0.2%	± 0.2%
AMCC current	± 0.6%	Rectangular	√3	1	1	± 0.4%	± 0.4%
Probe position during calibration	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%
Noise contribution	± 0.7%	Rectangular	√3	0.014	1	± 0.0%	± 0.4%
Frequency slope	± 5.9%	Rectangular	√3	0.1	1	± 0.3%	± 3.5%
Probe System							
Repeatability / drift	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%
Linearity / dynamic range	± 0.6%	Rectangular	√3	1	1	± 0.4%	± 0.4%
Acoustic noise	± 1.0%	Rectangular	√3	0.1	1	± 0.1%	± 1.0%
Probe angle	± 2.3%	Rectangular	√3	1	1	± 1.4%	± 1.4%
Spectral processing	± 0.9%	Rectangular	√3	1	1	± 0.5%	± 0.5%
Integration time	± 0.6%	Normal	1	1	5	± 0.6%	± 3.0%
field disturbation	**± 0.2%**	**Rectangular**	**√3**	**1**	**1**	**± 0.1%**	**± 0.1%**
Test signal							
Reference signal spectral response	± 0.6%	Rectangular	√3	0	1	± 0.0%	± 0.4%
Positioning							
Probe positioning	± 1.9%	Normal	1	1	1	± 1.1%	± 1.1%
Phantom thickness	± 0.9%	Normal	1	1	1	± 0.5%	± 0.5%
DUT positioning	± 1.9%	Rectangular	√3	1	1	± 1.1%	± 1.1%
External contributions							
RF interference	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%
test signal variation	**± 2.0%**	**Rectangular**	**√3**	**1**	**1**	**± 1.2%**	**± 1.2%**
Expanded Std. Uncertainty						**± 8.2%**	**± 12.3%**

Table 2: Measurement uncertainties

6.2 Test results

6.3 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200 was used.
The output power was measured using an integrated RF connector and attached RF cable.
The conducted output power was also checked before and after each SAR measurement. The resulting power values were within a 0.2 dB tolerance of the values shown below.

6.3.1 Conducted power measurements GSM 850 MHz

Channel / frequency	modulation	timeslots	slotted avg. power		time based avg. Power (calculated)	
128 / 824.2 MHz	GMSK	1	32.6	dBm	23.6	dBm
190 / 836.6 MHz	GMSK	1	32.7	dBm	23.7	dBm
251 / 848.8 MHz	GMSK	1	32.9	dBm	23.9	dBm

Table 3: Test results conducted power measurement GSM 850 MHz

6.3.2 Conducted power measurements GSM 1900 MHz

Channel / frequency	modulation	timeslots	slotted avg. power		time based avg. Power (calculated)	
512 / 1850.2 MHz	GMSK	1	32.6	dBm	23.6	dBm
661 / 1880.0 MHz	GMSK	1	32.7	dBm	23.7	dBm
810 / 1909.8 MHz	GMSK	1	32.9	dBm	23.9	dBm

Table 4: Test results conducted power measurement GSM 1900 MHz

6.3.3 Conducted power measurements WCDMA FDD II (1900 MHz)

Max. RMS output power 1900 MHz (FDD II) / dBm			
	Channel / frequency		
mode	9262 / 1852.4 MHz	9400 / 1880.0 MHz	9538 / 1907.6 MHz
RMC 12.2 kbit/s	**23.5**	**23.5**	**23.4**
AMR 4.75 kbit/s	23.5	23.5	23.4
AMR 5.15 kbit/s	23.5	23.5	23.4
AMR 5.9 kbit/s	23.5	23.5	23.3
AMR 6.7 kbit/s	23.5	23.4	23.4
AMR 7.4 kbit/s	23.5	23.5	23.4
AMR 7.95 kbit/s	23.5	23.4	23.3
AMR 10.2 kbit/s	23.5	23.5	23.4
AMR 12.2 kbit/s	23.5	23.5	23.4

Table 5: Test results conducted power measurement UMTS FDD II 1900MHz

6.3.4 Conducted power measurements WCDMA FDD V (850 MHz)

Max. RMS output power 850 MHz (FDD V) / dBm			
	Channel / frequency		
mode	4132 / 826.4 MHz	4182 / 836.6 MHz	4233 / 846.6 MHz
RMC 12.2 kbit/s	**24.5**	**24.5**	**24.4**
AMR 4.75 kbit/s	24.5	24.5	24.3
AMR 5.15 kbit/s	24.4	24.4	24.2
AMR 5.9 kbit/s	24.4	24.5	24.3
AMR 6.7 kbit/s	24.5	24.5	24.3
AMR 7.4 kbit/s	24.5	24.5	24.3
AMR 7.95 kbit/s	24.4	24.5	24.3
AMR 10.2 kbit/s	24.5	24.5	24.3
AMR 12.2 kbit/s	24.5	24.5	24.3

Table 6: Test results conducted power measurement UMTS FDD V 850MHz

6.3.5 System background noise check

The background noise was checked in axial, longitudinal and transversal probe orientations.
The noise spectrum is shown in annex A.1. Highest noise levels at 1 kHz do not exceed -55 dBA/m.

6.3.6 ABM2 check

ABM2 has been evaluated at T-coil position to select the channel with highest noise as test channel (1 frequency per band / communication system).

ABM2 comparison	
Mode / channel	ABM2 / dBA/m (noise level at T-Coil position)
GSM850 / 128	-19.20
GSM850 / 190	-18.33
GSM850 / 251	**-18.01**
GSM1900 / 512	-24.33
GSM1900 / 661	-23.37
GSM1900 / 810	**-22.16**
FDD V / 4132	**-39.67**
FDD V / 4182	-40.26
FDD V / 4233	-39.77
FDD II / 9262	-42.20
FDD II / 9400	**-42.03**
FDD II / 9538	-42.90

6.3.7 ABM1 and SNR measurement

ABM1 minimum field level requirement: **-18 dBA/m**
T-Coil requirement: **T4 : minimum 30 dB**
T3 : minimum 20 dB

Hearing Aid Compatibility results for T-Coil with GSM 850							
Channel / frequency	probe orientation	measured position (x/y)	ABM1 dBA/m	ABM2 dBA/m	SNR	category	air temperature
251 / 848.8 MHz	axial	(4.6, -5.2)	9.43	-17.39	26.82	T3	22.4 °C
251 / 848.8 MHz	transversal	(2.8, -8.5)	-3.17	-32.82	29.65	T3	22.4 °C

Table 7: Test results GSM 850

Hearing Aid Compatibility results for T-Coil with GSM 1900							
Channel / frequency	probe orientation	measured position (x/y)	ABM1 dBA/m	ABM2 dBA/m	SNR	category	air temperature
810 / 1909.8 MHz	axial	(4.4, -5.2)	9.12	-21.77	30.89	T4	22.4 °C
810 / 1909.8 MHz	transversal	(2.8, -8.5)	-3.09	-36.71	33.62	T4	22.4 °C

Table 8: Test results GSM 1900

Hearing Aid Compatibility results for T-Coil with WCDMA FDD V							
Channel / frequency	probe orientation	measured position (x/y)	ABM1 dBA/m	ABM2 dBA/m	SNR	category	air temperature
4132 / 826.4 MHz	axial	(4.4, -4.4)	9.15	-41.95	51.10	T4	22.4 °C
4132 / 826.4 MHz	transversal	(6.1, -12.5)	3.00	-47.66	50.66	T4	22.4 °C

Table 9: Test results WCDMA FDD V

Hearing Aid Compatibility results for T-Coil with WCDMA FDD II							
Channel / frequency	probe orientation	measured position (x/y)	ABM1 dBA/m	ABM2 dBA/m	SNR	category	air temperature
9400 / 1880.0 MHz	axial	(6.3, -6.0)	11.26	-39.98	51.24	T4	22.4 °C
9400 / 1880.0 MHz	transversal	(6.4, -12.5)	3.07	-47.42	50.49	T4	22.4 °C

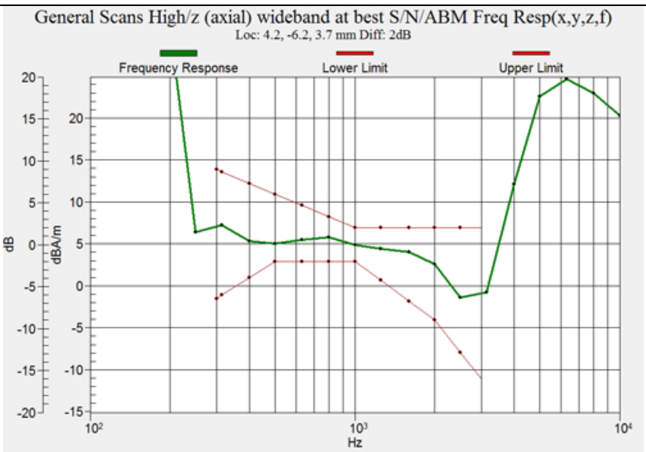
Table 10: Test results WCDMA FDD II

Overall category: T3

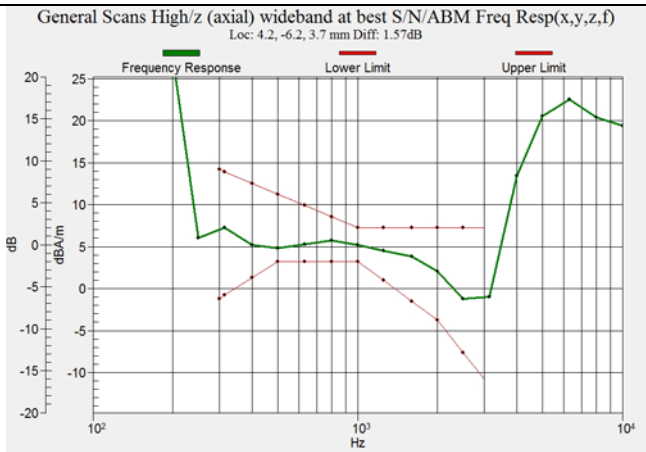
6.3.8 Frequency response

Frequency response has been measured at position with best SNR using a voice-like signal of 300 – 3000 Hz. Measurement was performed both with maximum volume.
The frequency response is shown in the plots.

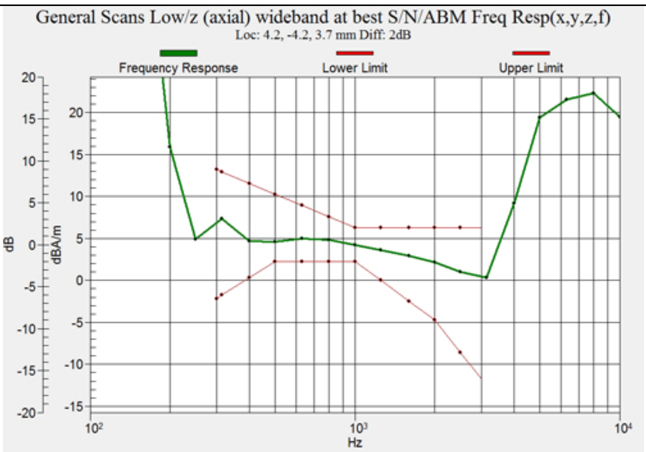
GSM 850 maximum volume



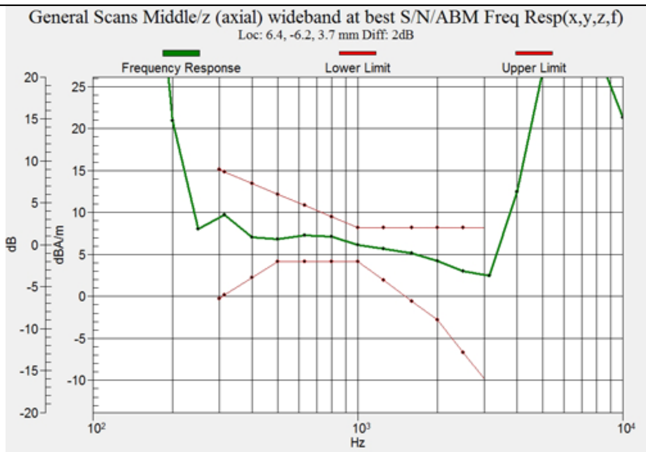
GSM 1900maximum volume



UMTS FDD V maximum volume



UMTS FDD II maximum volume



Frequency response verdict: passed

6.3.9 Description of test set-up

The device was tested using a CMU 200 communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power. The conducted output power was measured using an integrated RF connector and attached RF cable.
The test was performed under the following conditions:

Speaker muted
Backlight off
Maximum volume
Bluetooth off
T-Coil HAC mode on

7 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

Equipment	Type	Manufacturer	Serial No.	Last Calibration	Frequency (months)
Audio Magnetic 1D Field Probe	AM1DV2	Schmid & Partner Engineering AG	1005	May 08,2014	12
Audio Magnetic Measurement Instrument	AMMI SE UMS 010 BB	Schmid & Partner Engineering AG	1148	N/A	12
Audio Magnetic Calibration Coil	AMCC SD HAC P02 AB	Schmid & Partner Engineering AG	1007	N/A	12
Data acquisition electronics	DAE3V1	Schmid & Partner Engineering AG	477	May 14, 2014	12
Software	DASY52 52.8.5	Schmid & Partner Engineering AG	---	N/A	--
HAC test arch	SD HAC P01 BA	Schmid & Partner Engineering AG	1022	N/A	--
Universal Radio Communication Tester	CMU 200	Rohde & Schwarz	106826	January 27, 2014	12

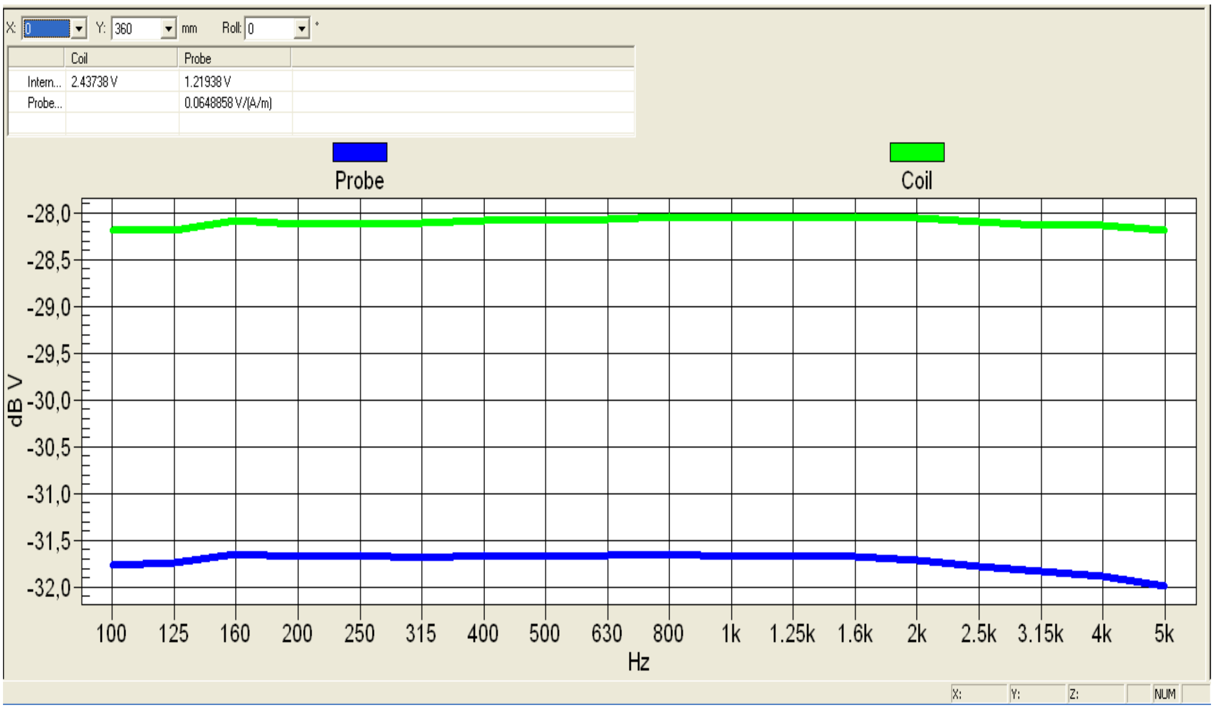
)* : Measurement devices are in a 1 or 2 year calibration cycle. System calibration with AMCC performed before each measurement

8 Observations

No observations exceeding those reported with the single test cases have been made.

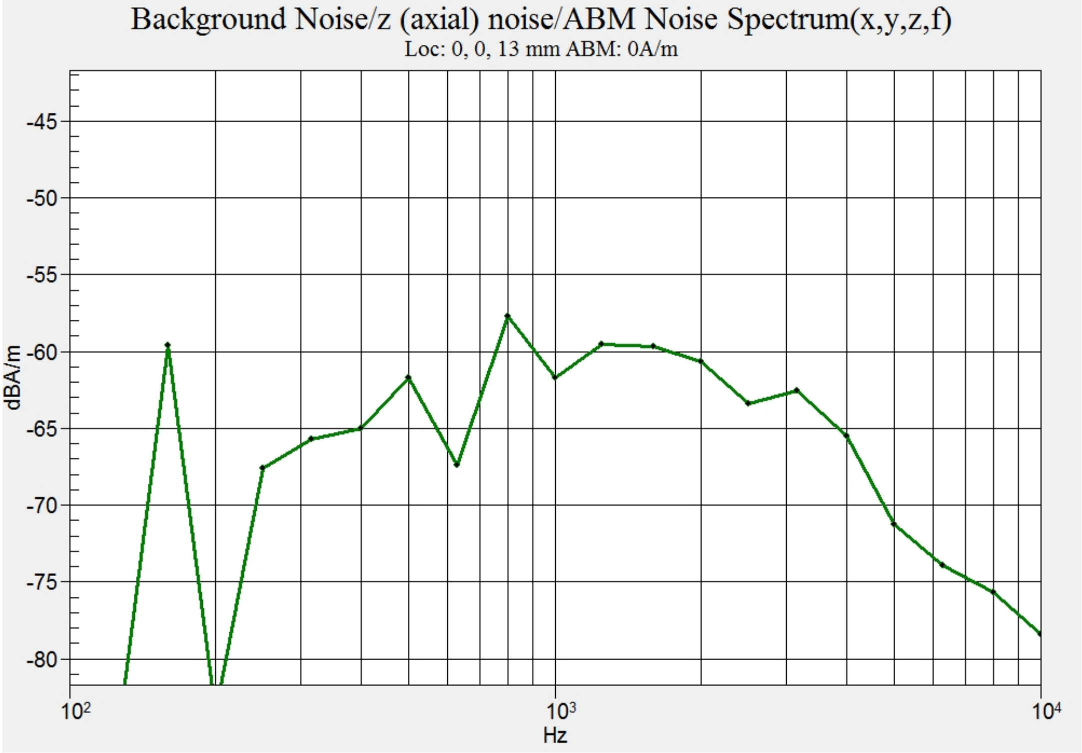
Annex A: System performance check

Probe calibration is performed using the AMCC Helmholtz coil. Frequency response and sensitivity is measured according to the following screen shot

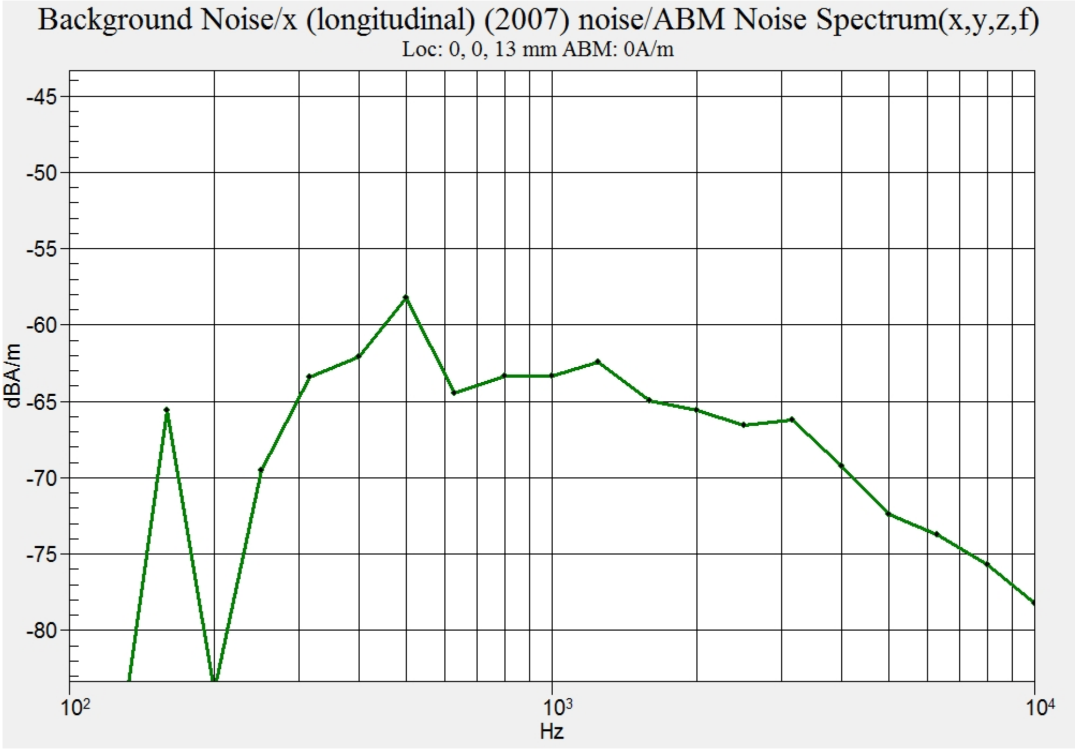


Remark: appearance of calibration result has changed since DASY52 52.8.1(838). The constant offset between coil and probe channel has replaced the slope starting at -50 dBV for 100 Hz and ending at -20 dBV for 4 kHz showing probe coil sensitivity as defined in chapter C.5 of ANSI-C63.

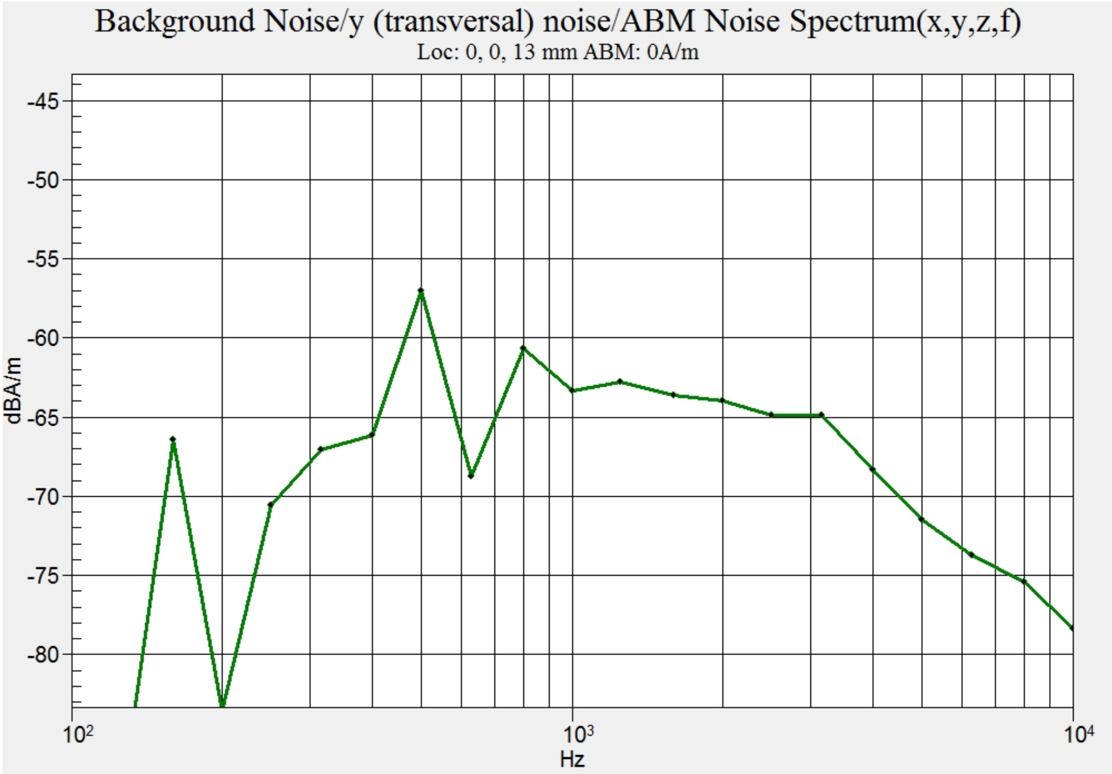
Noise floor of z axial probe orientation



Noise floor of x longitudinal probe orientation



Noise floor of y transversal probe orientation



Annex B: DASY5 measurement results

Annex B.1: GSM 850

Date/Time: 16.06.2014 13:40:16

HAC-T-Coil-850-z1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, Generic GSM; Frequency: 848.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

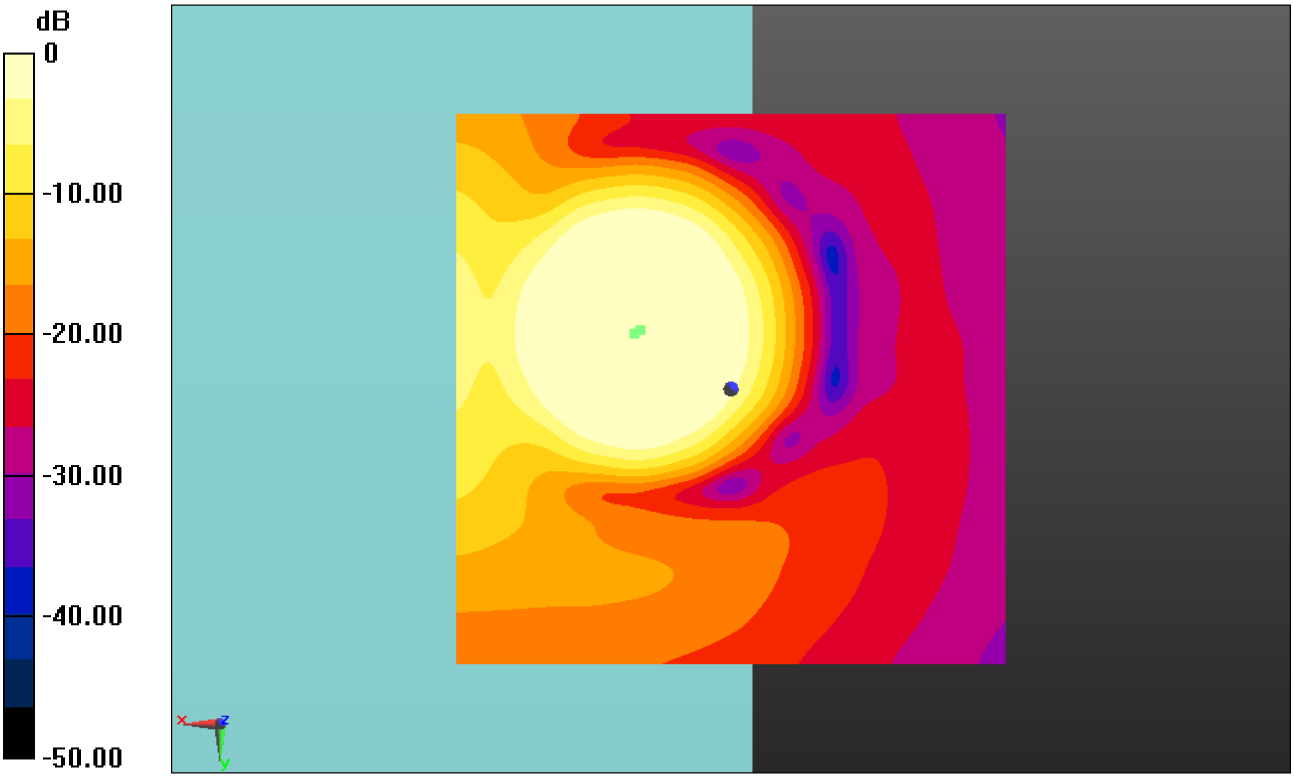
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1 = 12.26 dBA/m
BWC Factor = 0.16 dB
Location: 8.2, -5.4, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 12.38 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, -5, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 13:40:16

HAC-T-Coil-850-z2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, Generic GSM; Frequency: 848.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

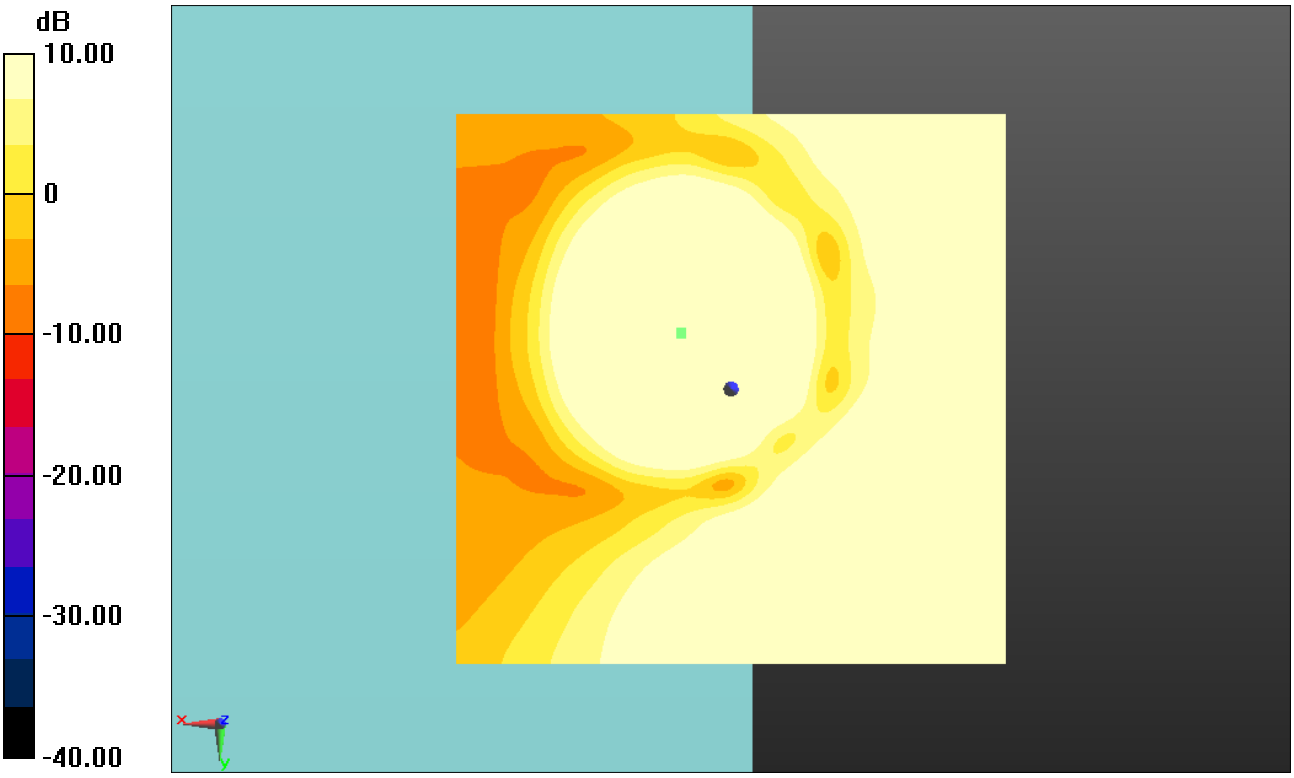
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1/ABM2 = 26.82 dB
ABM1 comp = 9.43 dBA/m
BWC Factor = 0.16 dB
Location: 4.6, -5.2, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 26.86 dB
ABM1 comp = 9.35 dBA/m
BWC Factor = 0.16 dB
Location: 4.6, -5, 3.7 mm



0 dB = 1.000 = 0.00 dB

Date/Time: 16.06.2014 13:45:32

HAC-T-Coil-850-y1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, Generic GSM; Frequency: 848.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

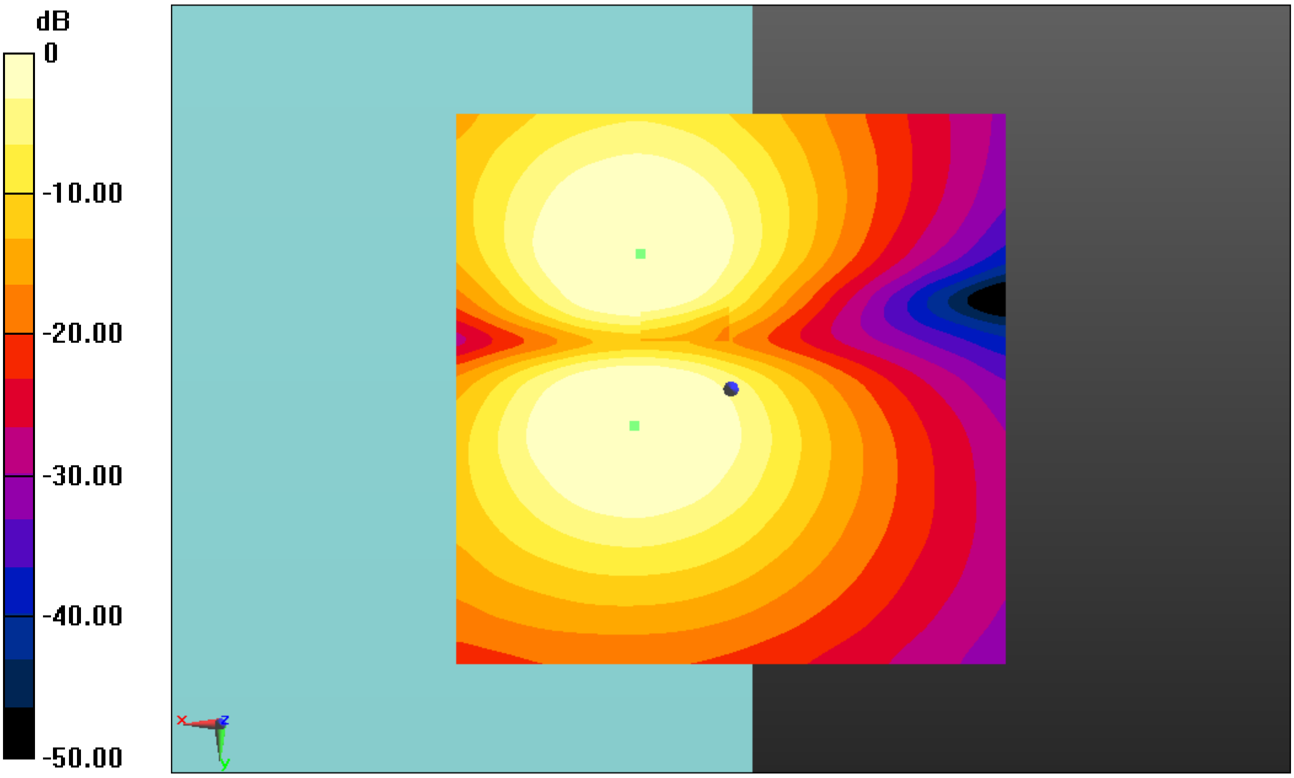
T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1 = 3.47 dBA/m
BWC Factor = 0.16 dB
Location: 8.2, -12.3, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.71 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, 3.3, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 13:45:32

HAC-T-Coil-850-y2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X

Communication System: UID 0, Generic GSM; Frequency: 848.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

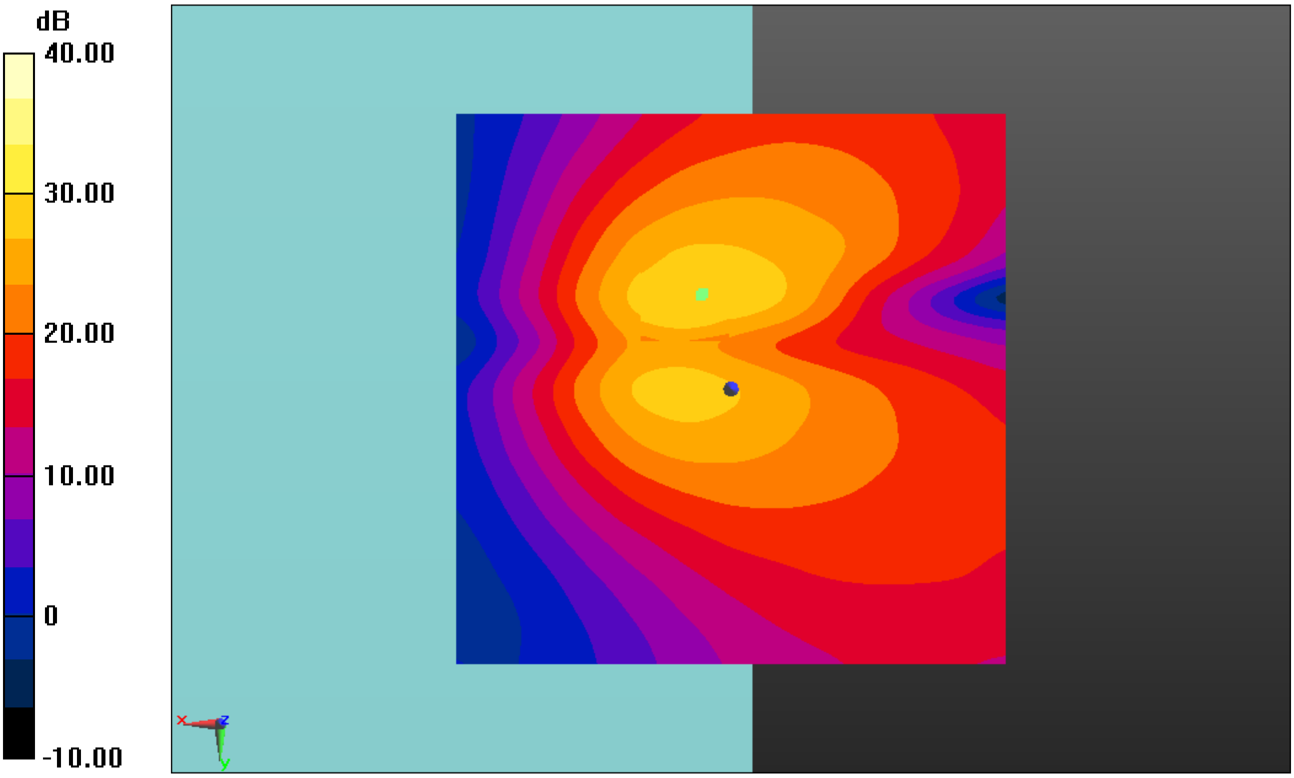
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1/ABM2 = 29.65 dB
ABM1 comp = -3.17 dBA/m
BWC Factor = 0.16 dB
Location: 2.8, -8.5, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 29.66 dB
ABM1 comp = -3.25 dBA/m
BWC Factor = 0.16 dB
Location: 2.5, -8.8, 3.7 mm



0 dB = 1.000 = 0.00 dB

Annex B.2: GSM 1900

Date/Time: 16.06.2014 14:29:40

HAC-T-Coil-1900-z1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, GSM (0); Frequency: 1909.8 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

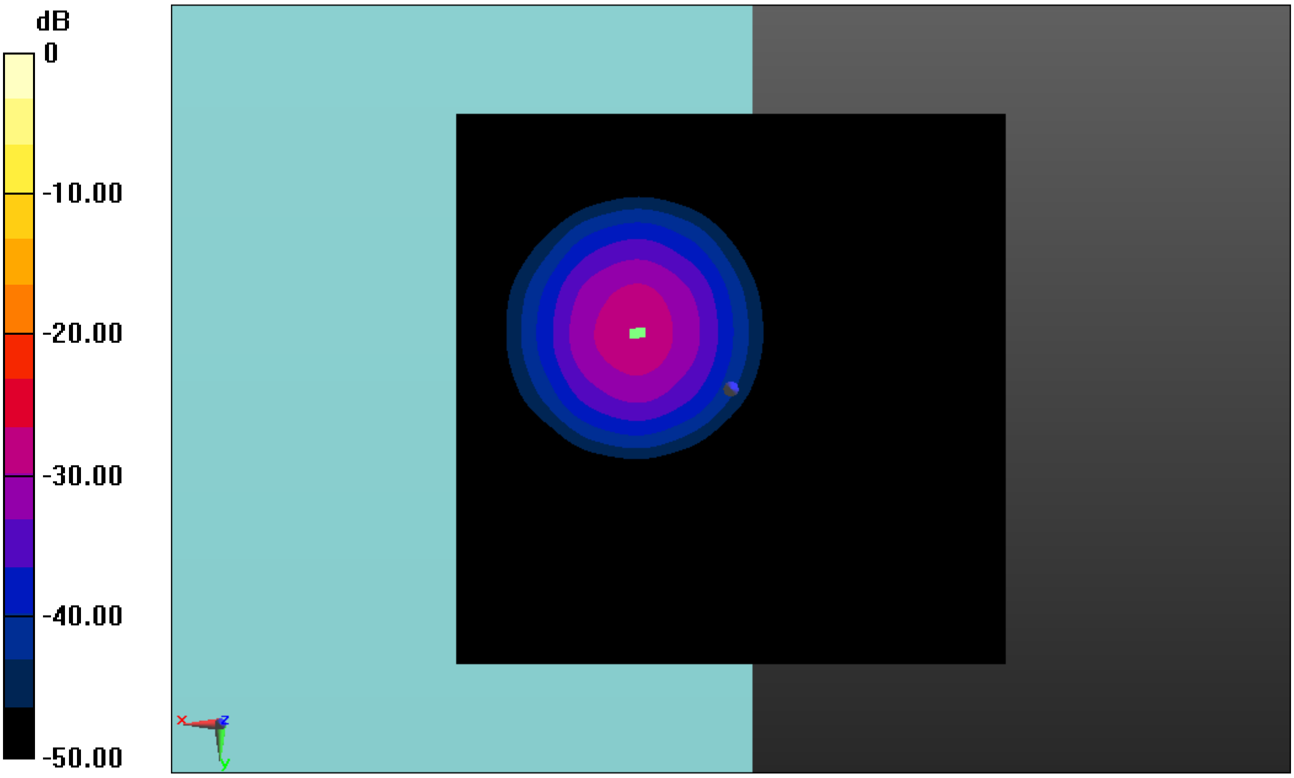
Category	Telephone parameters WD signal quality [(signal+noise)-to-noise ratio in decibels]
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

Cursor:
ABM1 = 12.28 dBA/m
BWC Factor = 0.16 dB
Location: 8.2, -5.2, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 12.45 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, -5, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 14:29:40

HAC-T-Coil-1900-z2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, GSM (0); Frequency: 1909.8 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

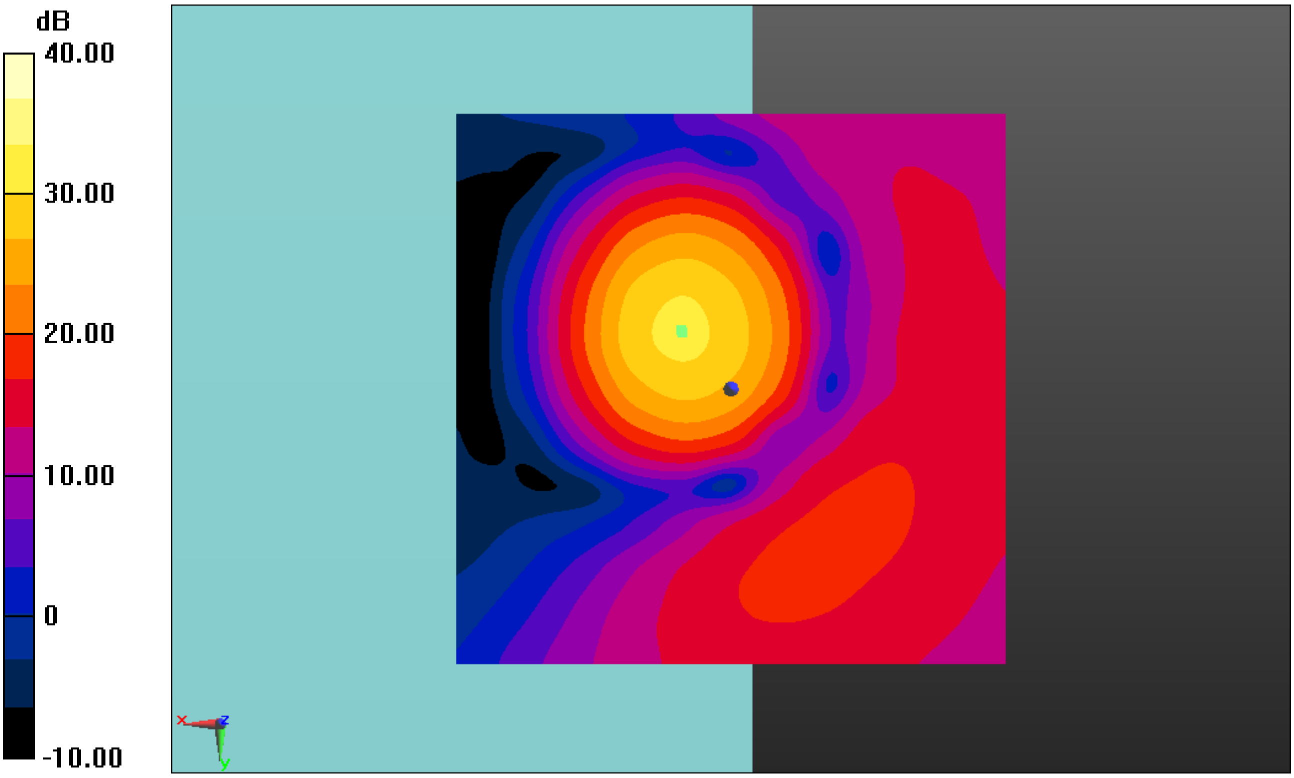
Category	**Telephone parameters WD signal quality [(signal+noise)-to-noise ratio in decibels]**
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

Cursor:
ABM1/ABM2 = 30.89 dB
ABM1 comp = 9.12 dBA/m
BWC Factor = 0.16 dB
Location: 4.4, -5.2, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 30.90 dB
ABM1 comp = 9.28 dBA/m
BWC Factor = 0.16 dB
Location: 4.6, -5.4, 3.7 mm



0 dB = 1.000 = 0.00 dB

Date/Time: 16.06.2014 14:34:56

HAC-T-Coil-1900-y1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, GSM (0); Frequency: 1909.8 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

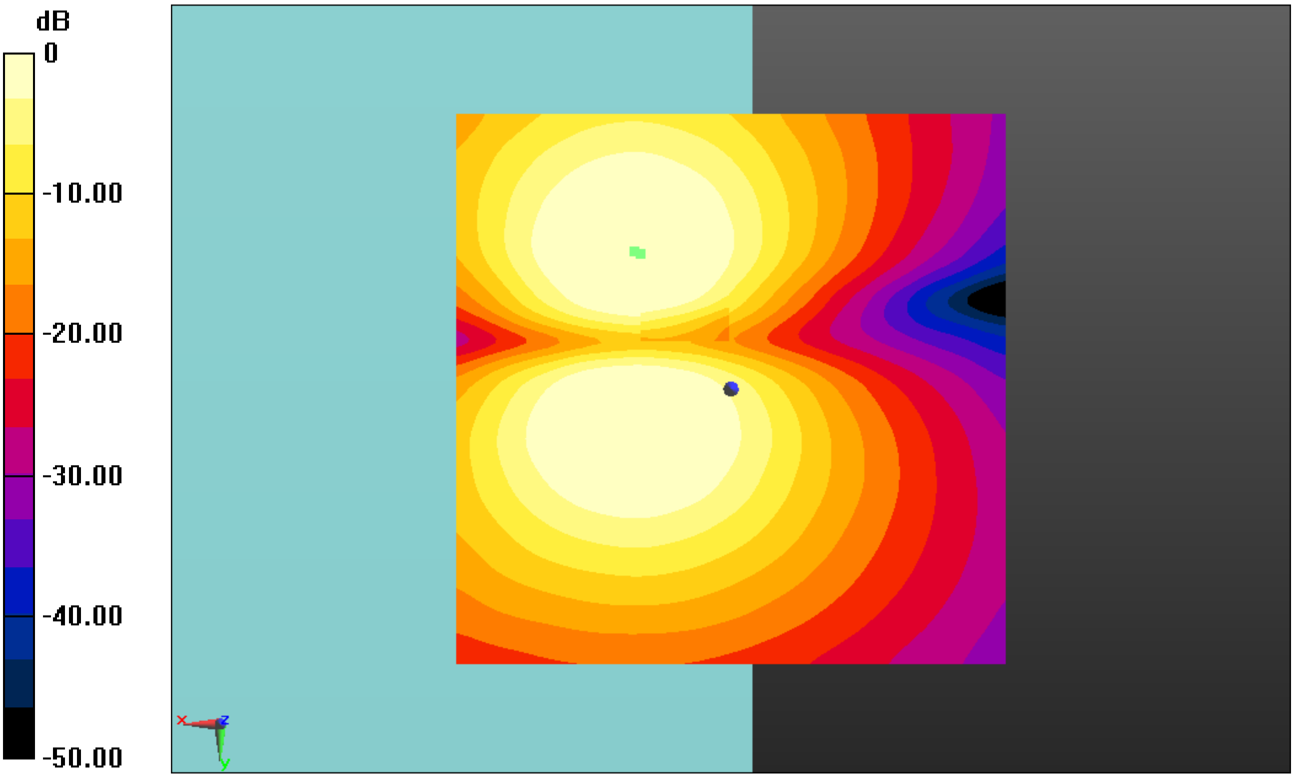
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1 = 3.61 dBA/m
BWC Factor = 0.16 dB
Location: 8.2, -12.3, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.76 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, -12.5, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 14:34:56

HAC-T-Coil-1900-y2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X

Communication System: UID 0, GSM (0); Frequency: 1909.8 MHz;Duty Cycle: 1:8.30042
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

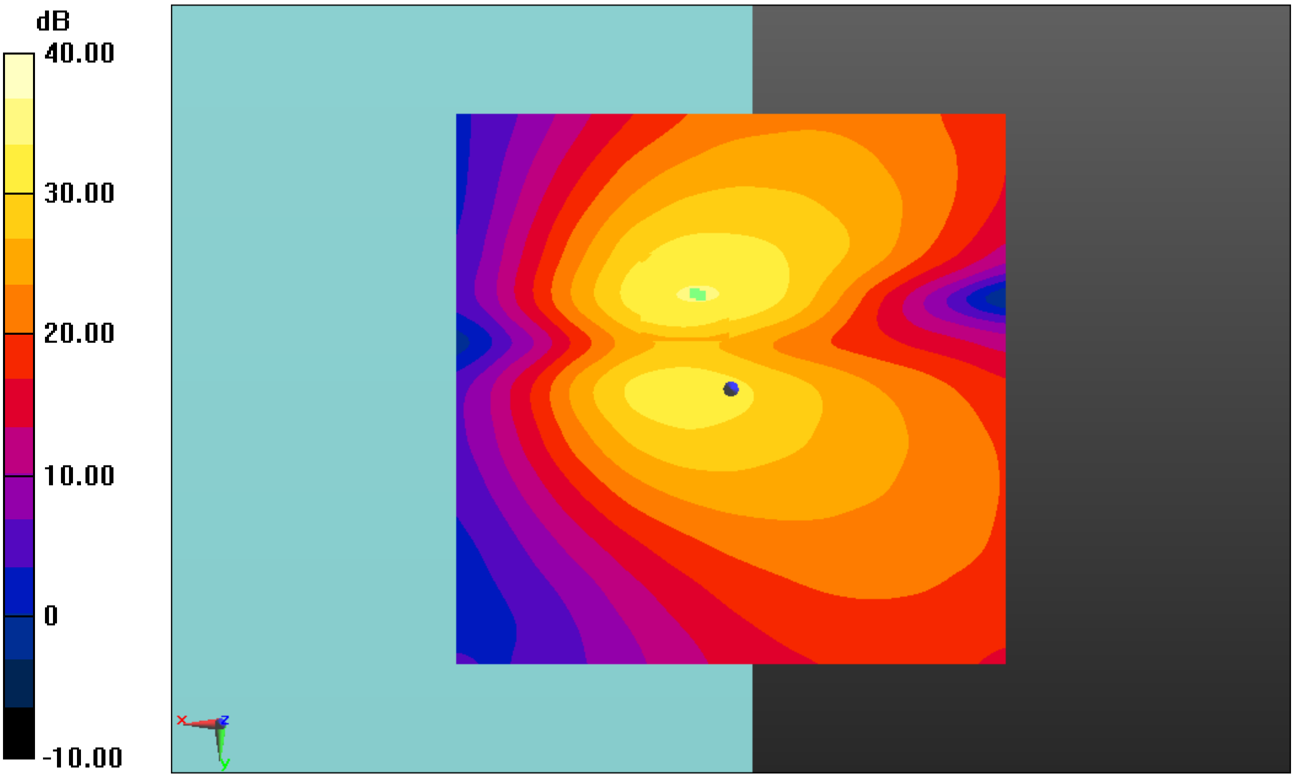
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1/ABM2 = 33.62 dB
ABM1 comp = -3.09 dBA/m
BWC Factor = 0.16 dB
Location: 2.8, -8.5, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans High/y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 33.64 dB
ABM1 comp = -2.10 dBA/m
BWC Factor = 0.16 dB
Location: 3.3, -8.8, 3.7 mm



0 dB = 1.000 = 0.00 dB

Annex B.3: UMTS FDD V

Date/Time: 16.06.2014 16:24:07

HAC-T-Coil-FDDV-z1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/z (axial) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

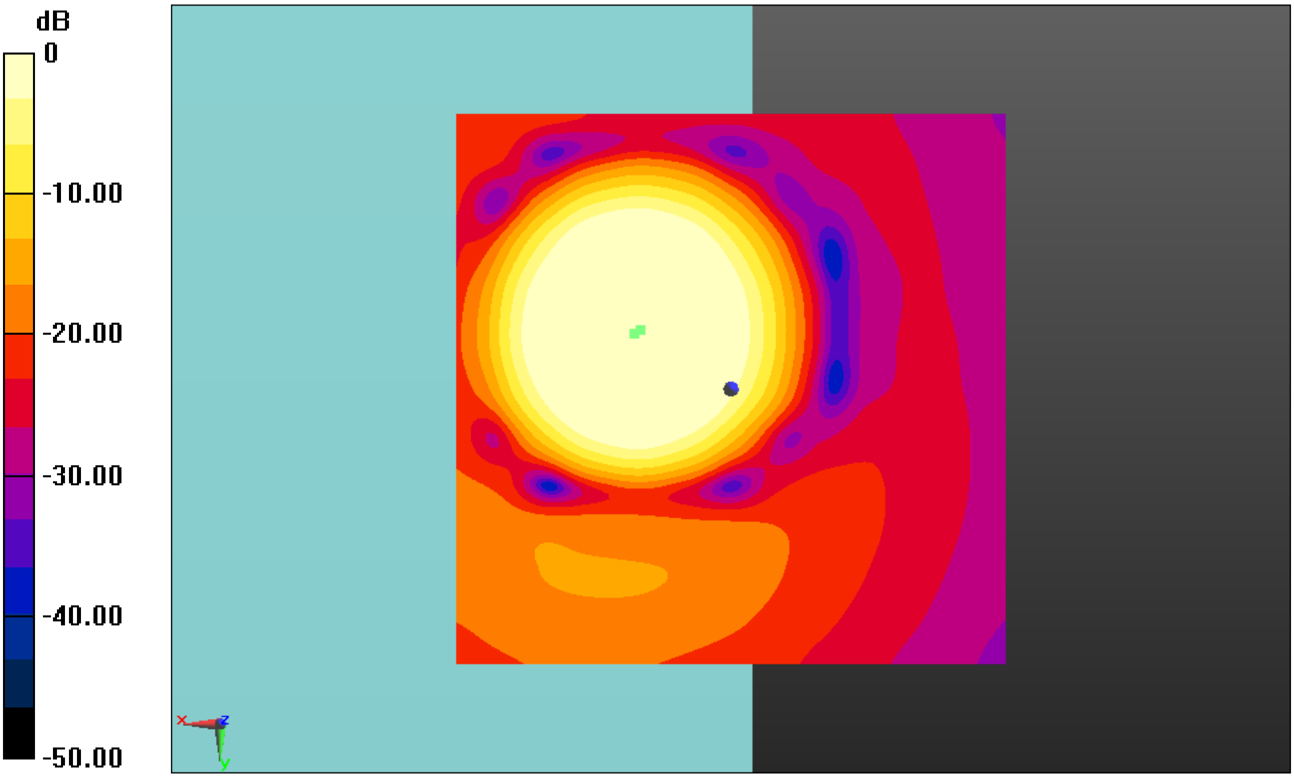
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1 = 12.37 dBA/m
BWC Factor = 0.16 dB
Location: 8.2, -5.4, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 12.39 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, -5, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 16:24:07

HAC-T-Coil-FDDV-z2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/z (axial) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

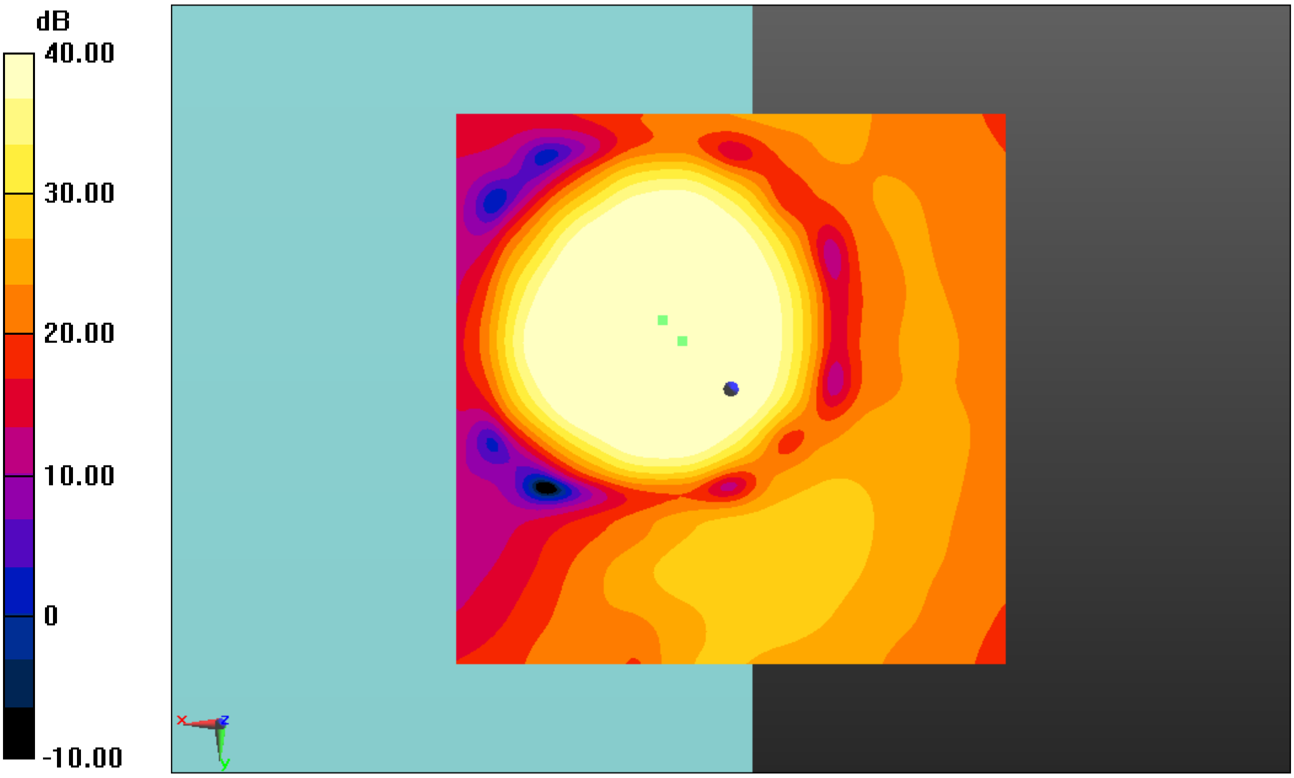
Category	**Telephone parameters WD signal quality [(signal+noise)-to-noise ratio in decibels]**
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

Cursor:
ABM1/ABM2 = 51.10 dB
ABM1 comp = 9.15 dBA/m
BWC Factor = 0.16 dB
Location: 4.4, -4.4, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 51.08 dB
ABM1 comp = 11.01 dBA/m
BWC Factor = 0.16 dB
Location: 6.3, -6.3, 3.7 mm



0 dB = 1.000 = 0.00 dB

Date/Time: 16.06.2014 16:29:23

HAC-T-Coil-FDDV-y1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/y (transversal) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

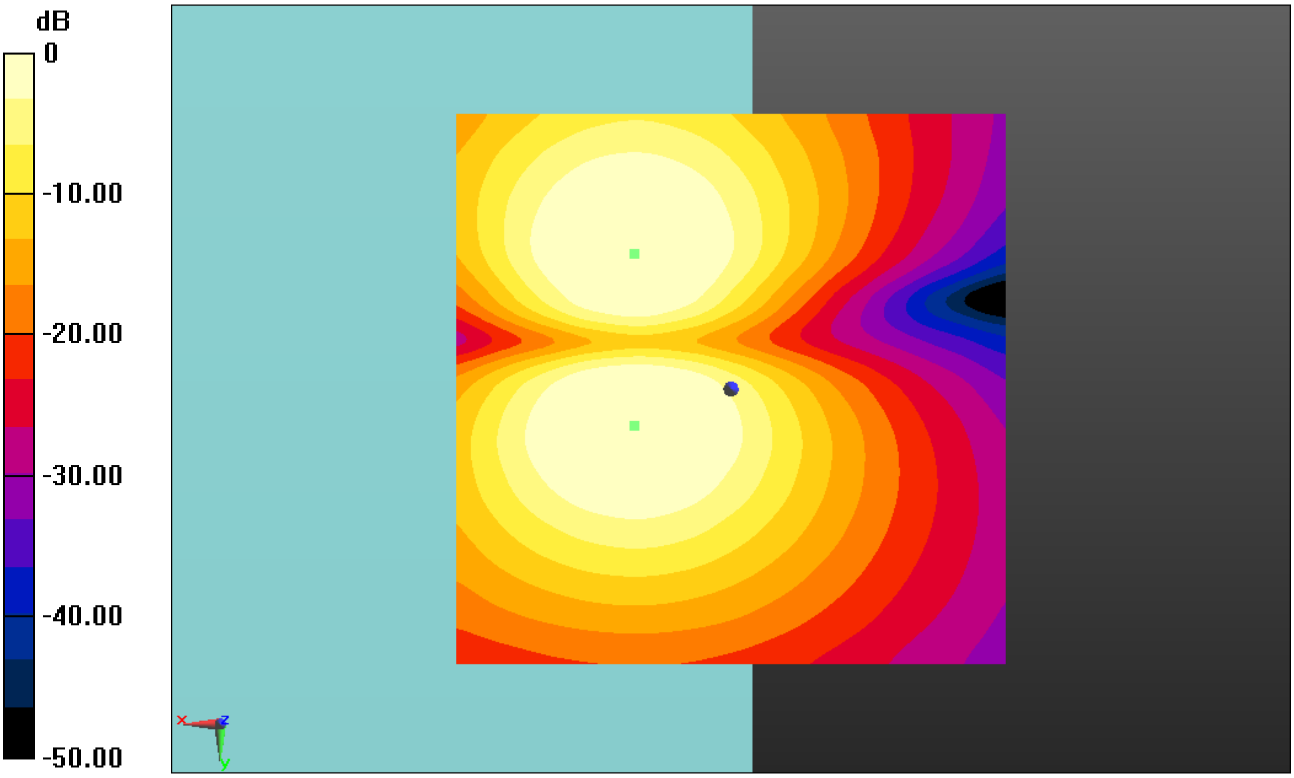
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1 = 3.80 dBA/m
BWC Factor = 0.16 dB
Location: 8.7, -12.3, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.87 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, 3.3, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 16:29:23

HAC-T-Coil-FDDV-y2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 0 kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/y (transversal) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

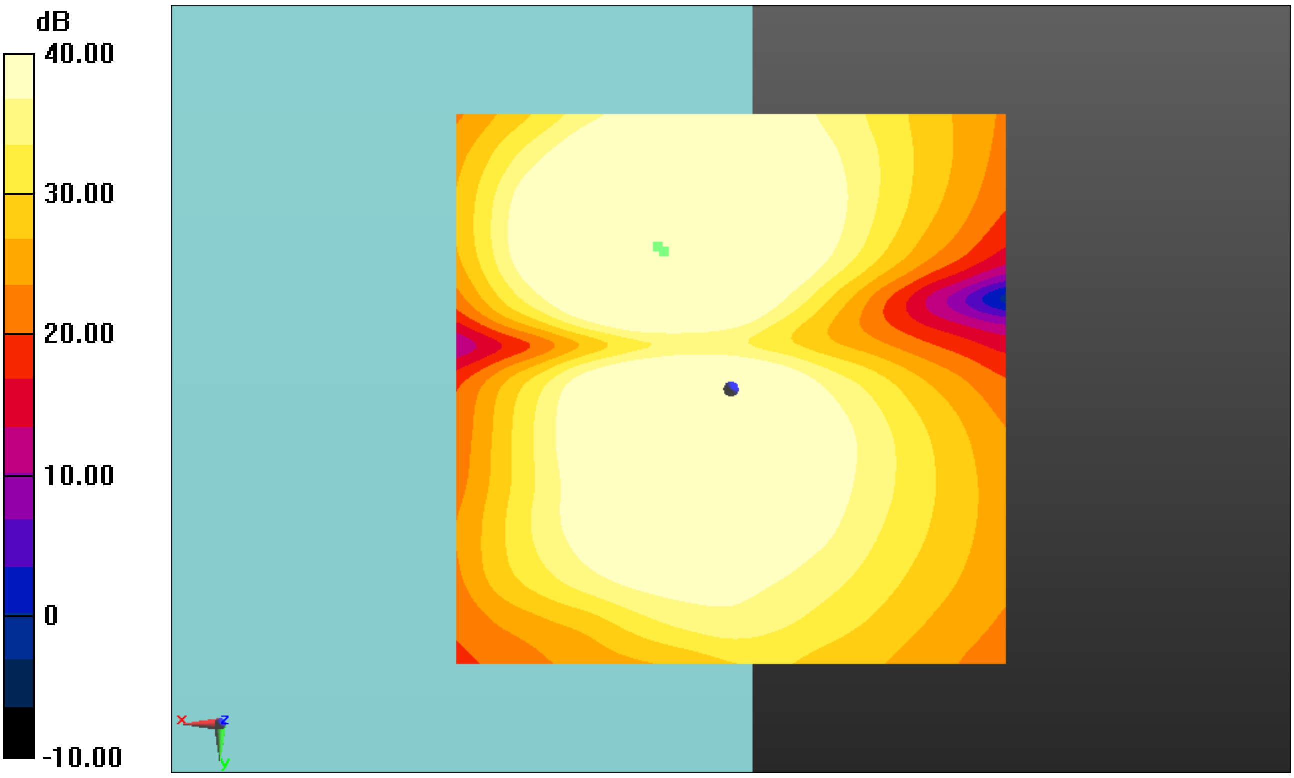
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1/ABM2 = 50.66 dB
ABM1 comp = 3.00 dBA/m
BWC Factor = 0.16 dB
Location: 6.1, -12.5, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Low/y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 50.85 dB
ABM1 comp = 3.28 dBA/m
BWC Factor = 0.16 dB
Location: 6.7, -12.9, 3.7 mm



0 dB = 1.000 = 0.00 dB

Annex B.4: UMTS FDD II

Date/Time: 16.06.2014 15:29:28

HAC-T-Coil-FDDII-z1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/z (axial) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

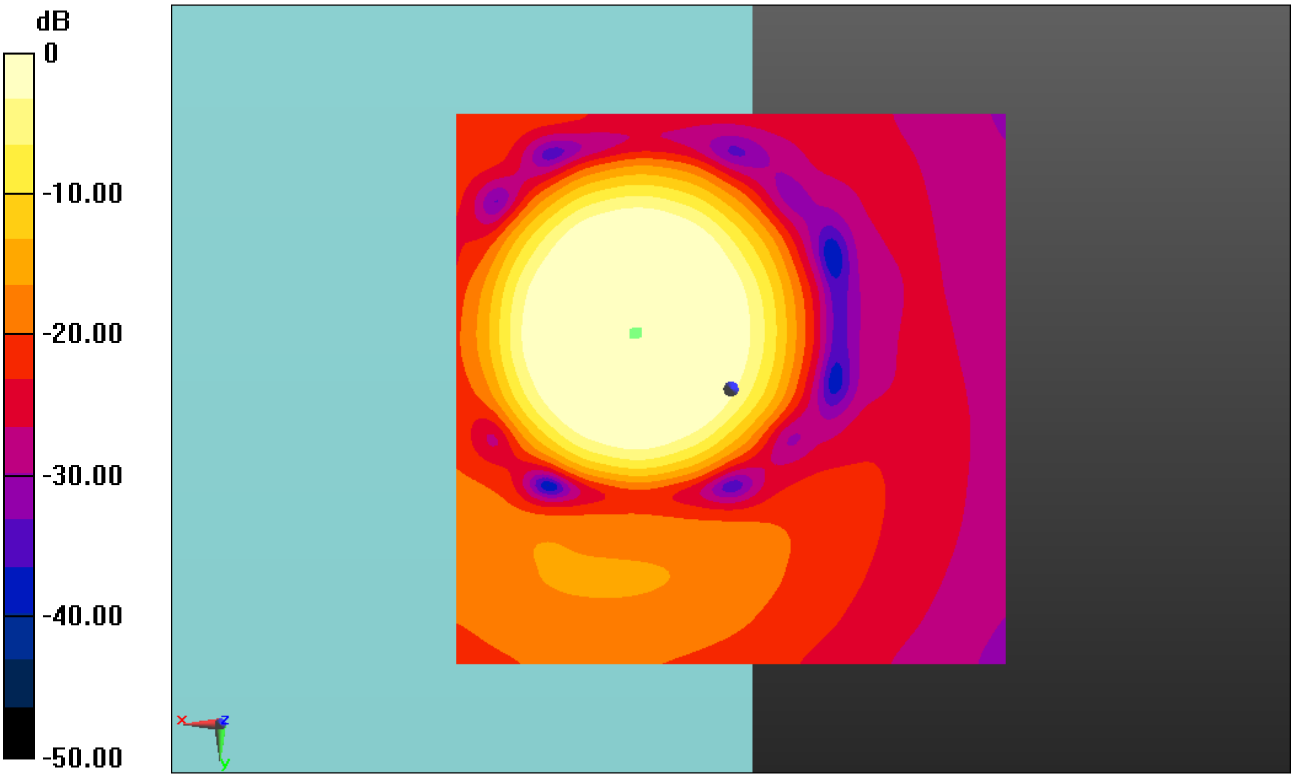
Category	Telephone parameters WD signal quality [(signal+noise)-to-noise ratio in decibels]
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

Cursor:
ABM1 = 12.39 dBA/m
BWC Factor = 0.16 dB
Location: 8.5, -5.2, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 12.40 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, -5, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 15:29:28

HAC-T-Coil-FDDII-z2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/z (axial) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

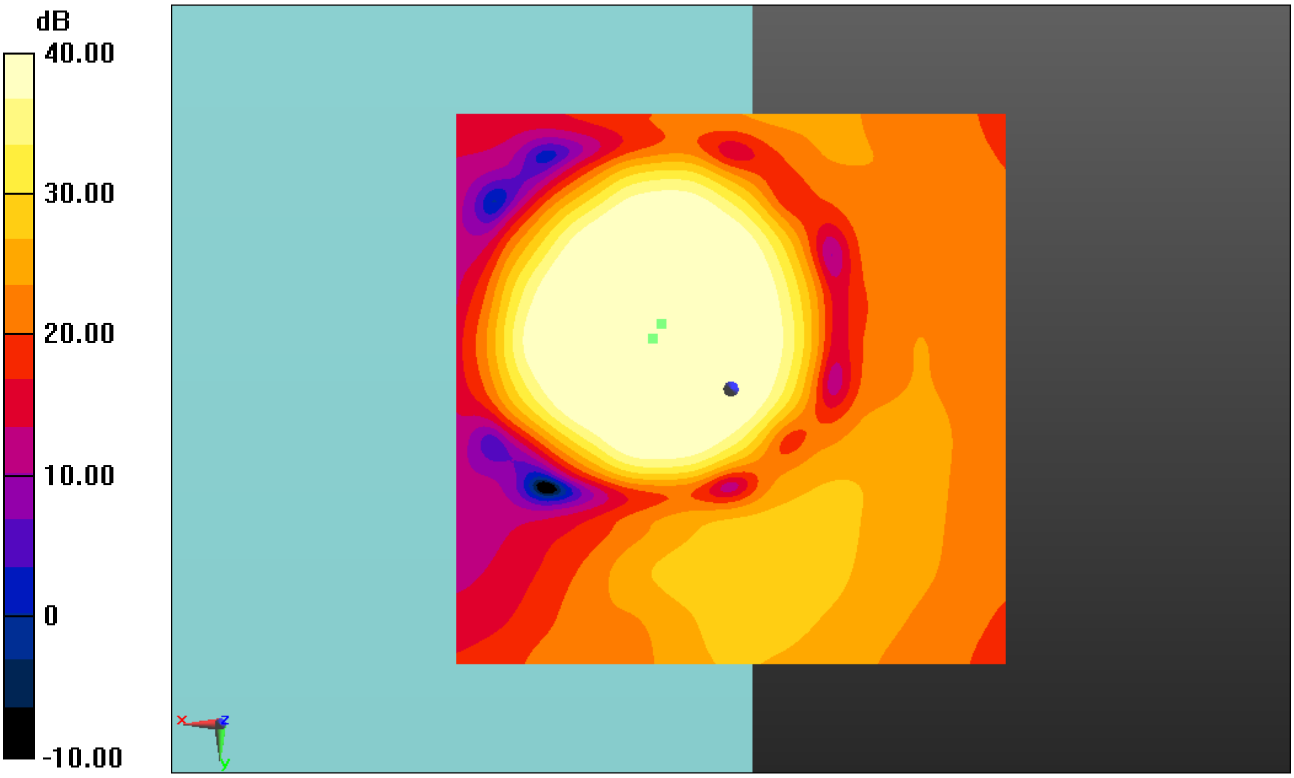
Category	**Telephone parameters WD signal quality [(signal+noise)-to-noise ratio in decibels]**
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

Cursor:
ABM1/ABM2 = 51.24 dB
ABM1 comp = 11.26 dBA/m
BWC Factor = 0.16 dB
Location: 6.3, -6, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1):

Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 51.45 dB
ABM1 comp = 11.86 dBA/m
BWC Factor = 0.16 dB
Location: 7.1, -4.6, 3.7 mm



0 dB = 1.000 = 0.00 dB

Date/Time: 16.06.2014 15:34:43

HAC-T-Coil-FDDII-y1

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/y (transversal) fine 2mm 8 x 8/ABM Interpolated Signal(x,y,z) (41x41x1):

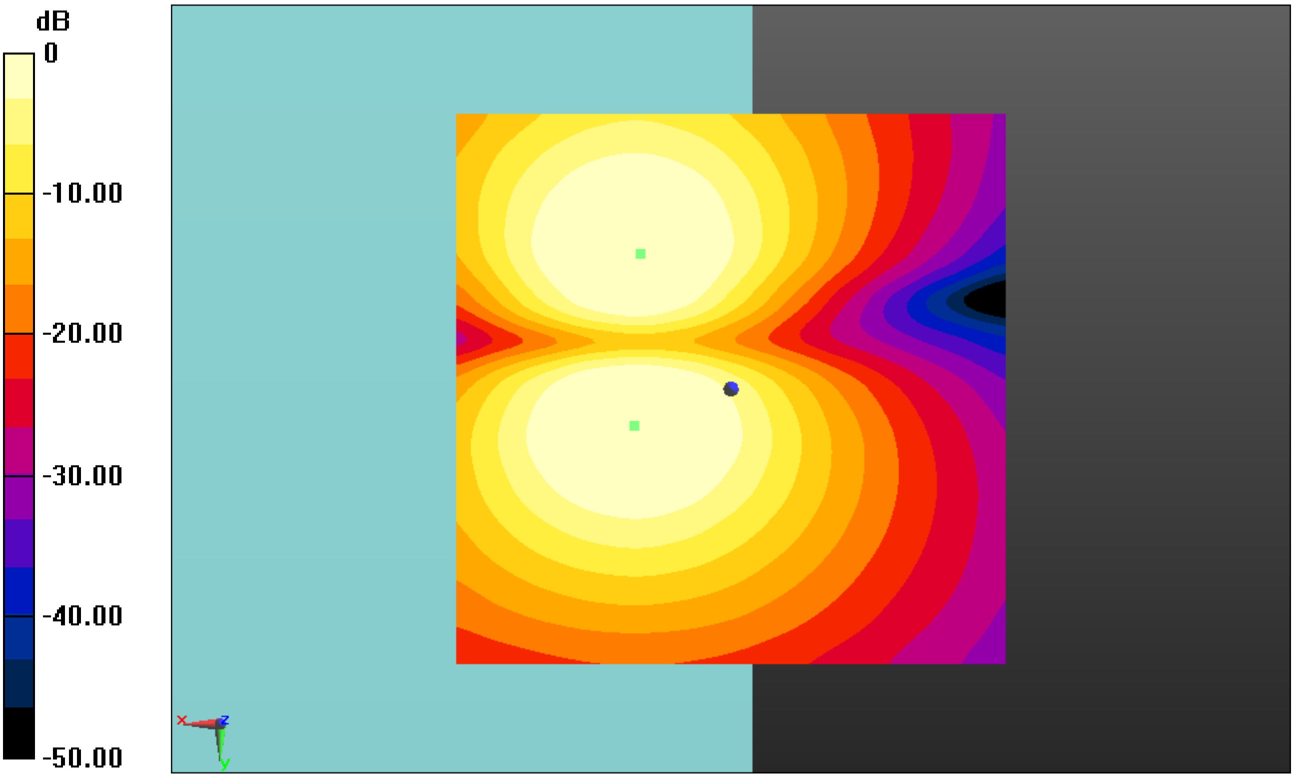
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1 = 3.66 dBA/m
BWC Factor = 0.16 dB
Location: 8.2, -12.3, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 3.74 dBA/m
BWC Factor = 0.16 dB
Location: 8.8, 3.3, 3.7 mm



0 dB = 1.000 A/m = 0.00 dBA/m

Date/Time: 16.06.2014 15:34:43

HAC-T-Coil-FDDII-y2

DUT: Sony; Type: PM-0740-BV; Serial: CB5A1Z1Y2X
Communication System: UID 0, UMTS FDD (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Phantom section: TCoil Section
DASY5 Configuration:
- Probe: AM1DV2 - 1005; ; Calibrated: 08.05.2014
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn477; Calibrated: 14.05.2014
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1007+1022
- Measurement SW: DASY52 52.8.7(1137); Postprocessing SW: SEMCAD X 14.6.10(7164)

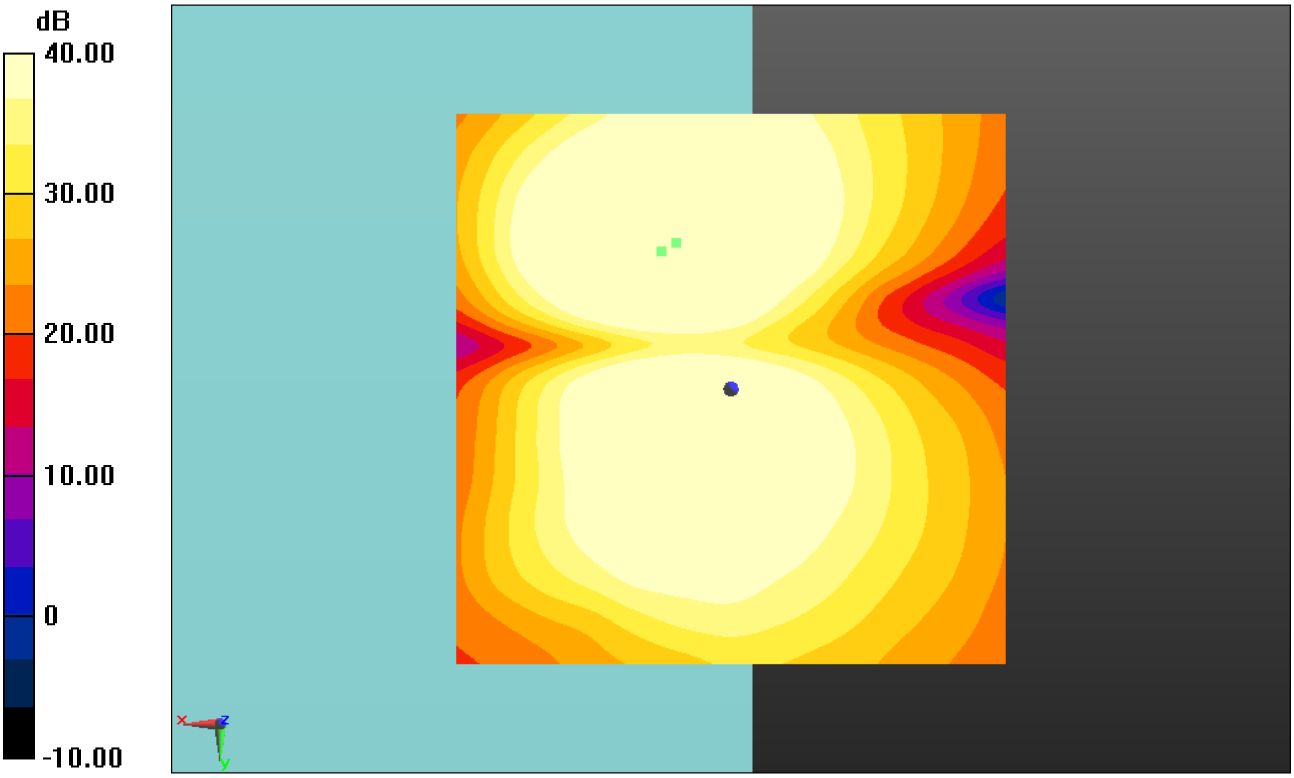
T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/y (transversal) fine 2mm 8 x 8/ABM Interpolated SNR(x,y,z) (41x41x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

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

Cursor:
ABM1/ABM2 = 50.49 dB
ABM1 comp = 3.07 dBA/m
BWC Factor = 0.16 dB
Location: 6.4, -12.5, 3.7 mm

T-Coil scan (scan for ANSI C63.19-2007 & 2011 compliance)/General Scans Middle/y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 35.3
Measure Window Start: 0ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 50.75 dB
ABM1 comp = 2.09 dBA/m
BWC Factor = 0.16 dB
Location: 5, -13.3, 3.7 mm



0 dB = 1.000 = 0.00 dB

Annex C: Photo documentation

Photo documentation is described in the additional document:

Appendix to test report no. 1-6965/13-20-31 Photo documentation

Annex D: HAC Calibration parameters

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

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

Accreditation No.: **SCS 108**

Client Cetecom

Certificate No: AM1DV2-1005_May14

CALIBRATION CERTIFICATE

Object	AM1DV2 - SN: 1005
Calibration procedure(s)	QA CAL-24.v3 Calibration procedure for AM1D magnetic field probes and TMFS in the audio range
Calibration date:	May 08, 2014

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	01-Oct-13 (No:13976)	Oct-14
Reference Probe AM1DV2	SN: 1008	14-Jan-14 (No. AM1D-1008_Jan14)	Jan-15
DAE4	SN: 781	13-Sep-13 (No. DAE4-781_Sep13)	Sep-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
AMCC	1050	01-Oct-13 (in house check Oct-13)	Oct-15
AMMI Audio Measuring Instrument	1062	26-Sep-12 (in house check Sep-12)	Sep-14

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	Leif Klysner
Approved by:	Fin Bomholt	Deputy Technical Manager	F. Bomholt

Issued: May 9, 2014

[References

[1] ANSI-C63.19-2007
American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

[2] ANSI-C63.19-2011
American National Standard, Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

[3] DASY5 manual, Chapter: Hearing Aid Compatibility (HAC) T-Coil Extension

Description of the AM1D probe

The AM1D 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+2]. The probe includes a symmetric 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 nominally 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+2] 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 a DASY system, the probe must be operated with the special probe cup provided (larger diameter).

Methods Applied and Interpretation of Parameters

- *Coordinate System:* The AM1D probe is mounted in the DASY system for operation with a HAC Test Arch phantom with AMCC Helmholtz calibration coil according to [3], with the tip pointing to "southwest" orientation.
- *Functional Test:* The functional test preceding calibration includes test of
  Noise level
  RF immunity (1kHz AM modulated signal). The shield of the probe cable must be well connected.
  Frequency response verification from 100 Hz to 10 kHz.
- *Connector Rotation:* The connector at the end of the probe does not carry any signals and is used for fixation to the DAE only. The probe is operated in the center of the AMCC Helmholtz coil using a 1 kHz magnetic field signal. Its angle is determined from the two minima at nominally +120° and –120° rotation, so the sensor in the tip of the probe is aligned to the vertical plane in z-direction, corresponding to the field maximum in the AMCC Helmholtz calibration coil.
- *Sensor Angle:* The sensor tilting in the vertical plane from the ideal vertical direction is determined from the two minima at nominally +120° and –120°. DASY system uses this angle to align the sensor for radial measurements to the x and y axis in the horizontal plane.

Sensitivity: With the probe sensor aligned to the z-field in the AMCC, the output of the probe is compared to the magnetic field in the AMCC at 1 kHz. The field in the AMCC Helmholtz coil is given by the geometry and the current through the coil, which is monitored on the precision shunt resistor of the coil.

AM1D probe identification and configuration data

Item	**AM1DV2** Audio Magnetic 1D Field Probe
Type No	SP AM1 001 AA
Serial No	**1005**

Overall length	296 mm
Tip diameter	6.0 mm (at the tip)
Sensor offset	3.0 mm (centre of sensor from tip)
Internal Amplifier	40 dB

Manufacturer / Origin	Schmid & Partner Engineering AG, Zürich, Switzerland
Manufacturing date	February 01, 2006
Last calibration date	May 14, 2013

Calibration data

Connector rotation angle	(in DASY system)	**182.9 °**	+/- 3.6 ° (k=2)
Sensor angle	(in DASY system)	**2.66 °**	+/- 0.5 ° (k=2)
Sensitivity at 1 kHz	(in DASY system)	**0.0661 V / (A/m)**	+/- 2.2 % (k=2)

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

Annex E: Document History

Version	Applied Changes	Date of Release
	Initial Release	2014-06-18

Annex F: Further Information

Glossary

DUT	-	Device under Test
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HAC	.	Hearing Aid Compatibility
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software