HAC T-Coil TESTREPORT

No. I19Z62348-SEM02

For

Shenzhen Tinno Mobile Technology Corp.

Smart Phone

Model Name: U304AC

With

Hardware Version: V1.0

Software Version: U304ACV02.15.11

FCC ID: XD6U304AA

Results Summary: T Category = T4

Issued Date: 2020-1-22

TESTING
NVLAP LAB CODE 600118-0

Note:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I19Z62348-SEM02	Rev.0	2020-1-22	Initial creation of test report

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL(Shouxiang)
Address:	No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China100191

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:	April 29, 2019
Testing End Date:	January 15, 2020

1.4 Signature

Lin Xiaojun

(Prepared this test report)

Qi Dianyuan

(Reviewed this test report)

Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2 Client Information

2.1 Applicant Information

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2.2 Manufacturer Information

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Address /Post:	4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District,Shenzhen, P.R.China
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Email:	jingwen.guo@tinno.com
Telephone:	0755-86095550
Fax:	/

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

This EUT is a variant product and the report of original sample is No.I20Z60012-SEM02. We do the spot check and share all results of original sample and add the evaluation of Google duo. The results of spot check and Google duo are presented in the annex F.

3.1 About EUT

Description:	Smart Phone
Model name:	U304AC
Operating mode(s):	GSM 850/900/1800/1900 WCDMA850/1700/1900 LTE B2/4/5/12/14/30, BT, WiFi

3.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	863465040003569	V1.0	U304ACV02.15.11
EUT2	863465040003627	V1.0	U304ACV02.15.11

*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	LT25H426271B	0	Shenzhen BYD Lithium Battery Company Limited

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

3.4 Air Interfaces / Bands Indicating Operating Modes

Air-interface	**Band(MHz)**	**Type**	**C63.19/tested**	**Simultaneous Transmissions**	**OTT**
GSM	850	VO	Yes	BT, WLAN	NA
	1900				
GPRS/EDGE	850	DT	Yes		Google duo
	1900				
WCDMA (UMTS)	850	VO	Yes	BT, WLAN	NA
	1700				
	1900				
	HSPA	DT	Yes		Google duo
LTE FDD	Band 2/4/5/12/14/30	V/D	Yes	BT, WLAN	Google duo
BT	2450	DT	NA	GSM,WCDMA,LTE	NA
WLAN	2450	V/D	Yes	GSM,WCDMA,LTE	Google duo

VO: Voice CMRS/PSTN Service Only V/D: Voice CMRS/PSTN and Data Service DT: Digital Transport

* HAC Rating was not based on concurrent voice and data modes, Non current mode was found to represent worst case rating for both M and T rating

Note1 = No Associated T-Coil measurement has been made in accordance with 285076 D02 T-Coil testing for CMRS IP

4 Reference Documents

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

Reference	Title	Version
ANSI C63.19-2011	American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids	2011 Edition

5 OPERATIONAL CONDITIONS DURING TEST

5.1 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 Core21.86 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.

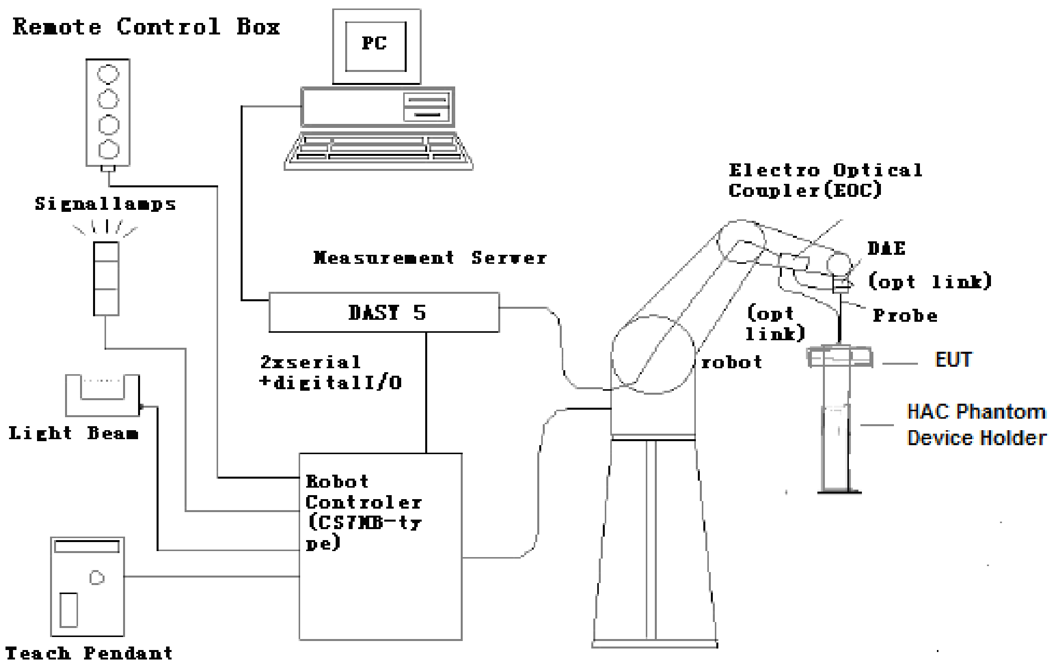


Figure 5.1 HAC Test Measurement Set-up

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.

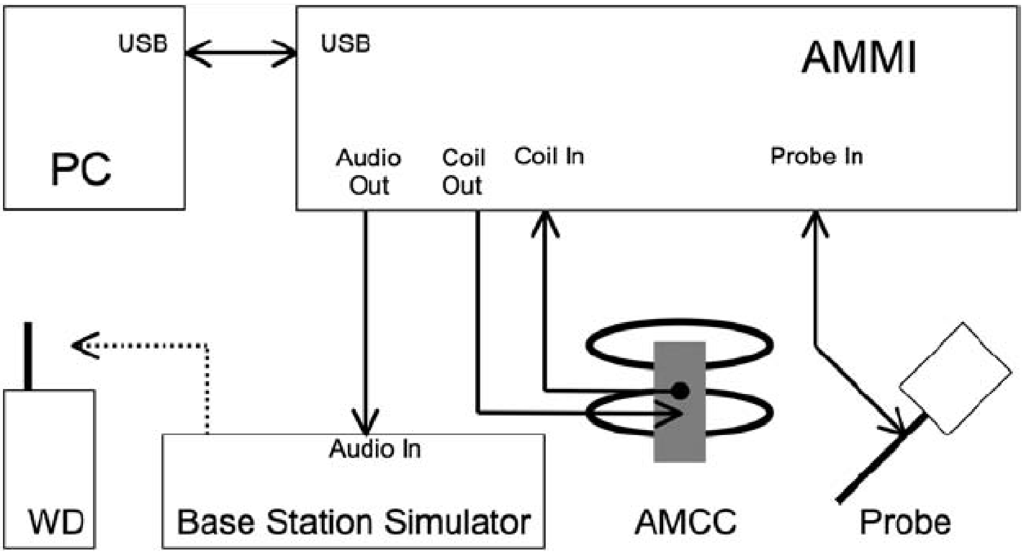


Figure 5.2 T-Coil setup with HAC Test Arch and AMCC

5.2 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

5.3 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

5.4 AMMI

Figure 5.3 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

5.5 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.

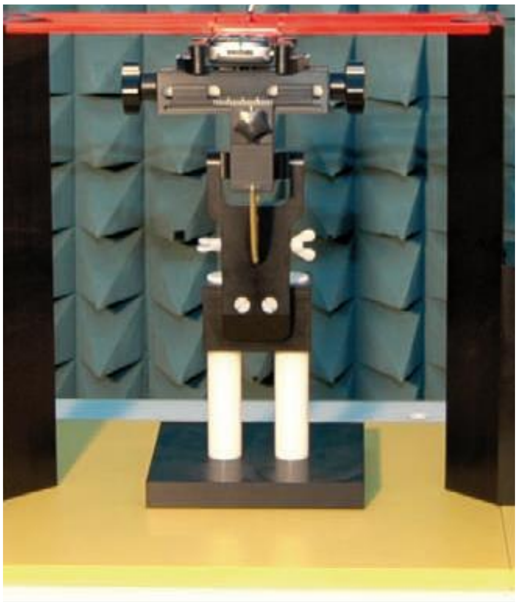


Figure 5.4 HAC Phantom & Device Holder

5.6 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: 1.86GHz

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

5.7 T-Coil measurement points and reference plane

Figure 6.5 illustrates the standard probe orientations. Position 1 is the perpendicular orientation of the probe coil; orientation 2 is the transverse 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.

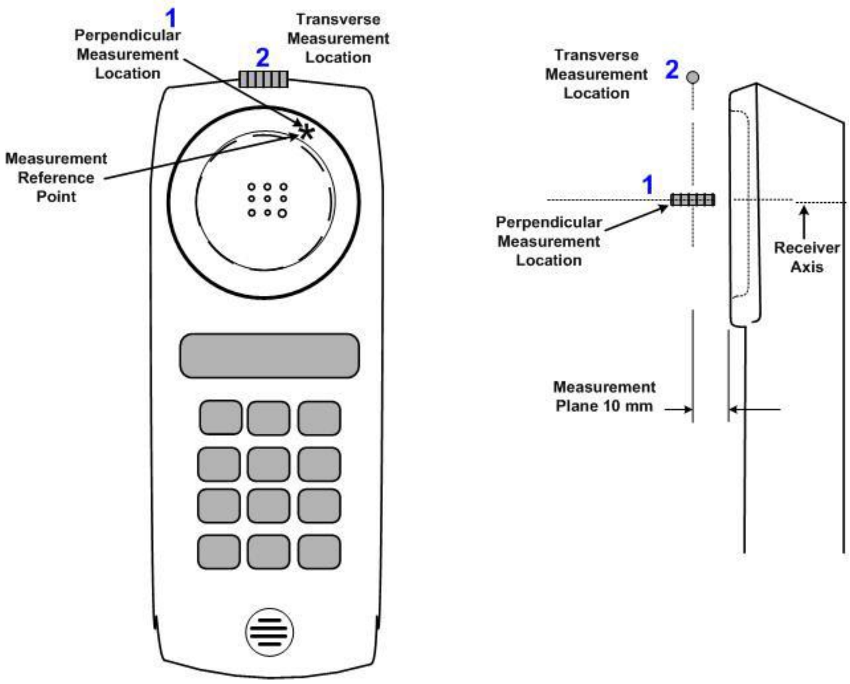


Figure 5.5 Axis and planes for WD audio frequency magnetic field measurements

6 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 7.4.2.1.

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.

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 7.4.4.2. 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 perpendicular and transverse orientation, and the frequency response was measured for perpendicular.

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.

7 T-Coil PERFORMANCE REQUIREMENTS

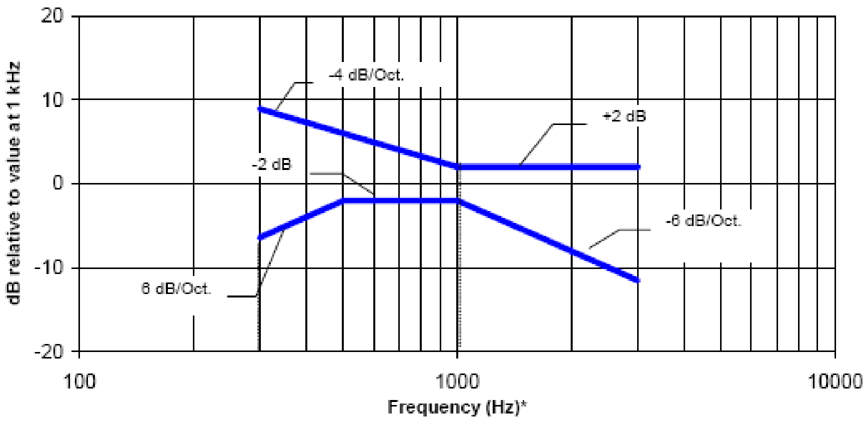
In order to be rated for T-Coil use, a WD shall meet the requirements for signal level and signal quality contained in this part.

7.1 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, ina1/3 octave band filter for all orientations.

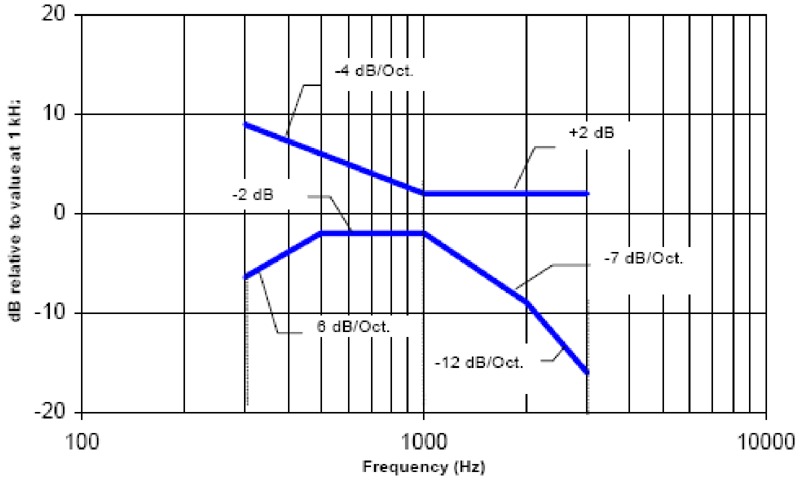
7.2 Frequency response

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 7.1—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 7.2—Magnetic field frequency response for WDs with a fieldthat exceeds –15 dB(A/m) at 1 kHz

7.3 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 noimmunity 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

8 CMRS Voice DUT CONFIGURATION

8.1 GSM Codec Investigation

The middle channel of each frequency band is used for T-coil testing according ANSI C63.19-2011. Choose worst case from radio configuration investigation. After investigation was performed to determine the audio codec configuration to be used for testing, the following tests results which the worst case codec would be remarked to be used for the testing for the DUT.

Table 8-1 GSM CMRS Codec Investigation

Codec Setting	FR VR	HR V1	EFR	Orientation	Band	Channel
ABM1 (dBA/m)	6.53	6.29	7.09	Z(axial)	GSM1900	661
Frequency Response	PASS	PASS	PASS			
SNR (dB)	44.29	45.50	45.06			

8.2 UMTS Codec Investigation

The middle channel of each frequency band is used for T-coil testing according ANSI C63.19-2011. Choose worst case from radio configuration investigation. After investigation was performed to determine the audio codec configuration to be used for testing, the following tests results which the worst case codec would be remarked to be used for the testing for the DUT.

Table 8-2 WCDMA/UMTS CMRS Codec Investigation

Codec Setting	AMR 12.2kbps	AMR 7.95kbps	AMR 4.75kbps	Orientation	Band	Channel
ABM1 (dBA/m)	2.78	1.70	2.69	Z(axial)	WCDMA 1900	9400
Frequency Response	PASS	PASS	PASS			
SNR (dB)	45.37	44.65	45.96			

9 VoLTE TEST SYSTEM SETUP AND DUT CONFIGURATION

9.1 Test System Setup for VoLTE over IMS T-coil Testing

The general test setup used for VoLTE over IMS is shown below. The callbox used when performing VoLTE over IMS T-coil measurements is a CMW500. The Data Application Unit (DAU) of the CMW500 was used to simulate the IP Multimedia Subsystem (IMS) server. According to C63 and KDB 285076 D02v03, VoLTE input level is -20dBm0.

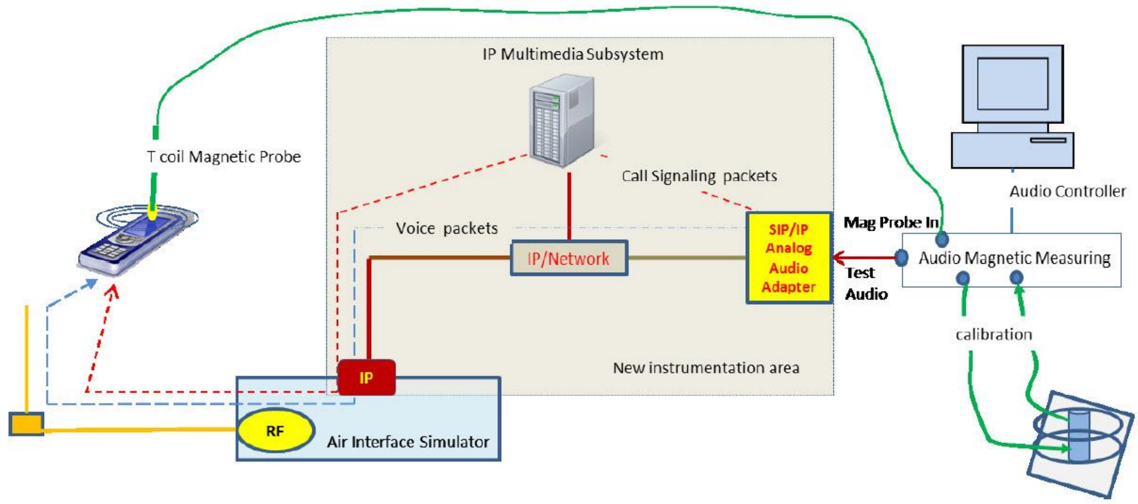


Figure 9.1 Test Setup for VoLTE over IMS T-coil Measurements

No correction gain factors were measured for VoLTE due to the Rohde & Schwarz CMW500, hosting a calibrated audio board. The gains used to measure VoLTE are set to 100.
The following software/firmware was used to simulate the VoLTE server for testing:

Firmware	License Keys	Software Name
V3.7.50 for LTE	KS500	LTE FDD R8 SIG BASIC
	KS550	LTE TDD R8 SIG BASIC
	KA100	IP APPL ENABLING IPv4
	KA150	IP APPL ENABLING IPv6
V3.7.20 for Audio	KAA20	IP APPL IMS BASIC
	KM050	DATA APPL MEAS
	KS104	EVS SPEECH CODEC

9.2 Codec Configuration

An investigation was performed to determine the audio codec configuration to be used for testing. The NB AMR 4.75kbps setting was used for the audio codec on the CMW500 for VoLTE over IMS T-coil testing. See below table for comparisons between different codecs and codec data rates:

Table 9-1 AMR Codec Investigation – VoLTE over IMS

Codec Setting	WB AMR 23.85kbps	WB AMR 6.60kbps	NB AMR 12.2kbps	NB AMR 4.75kbps	Orientation	Band/BW	Channel
ABM1 (dBA/m)	5.80	5.98	4.98	5.86	Z(axial)	B2/20M	18900
Frequency Response	PASS	PASS	PASS	PASS			
SNR (dB)	47.57	47.25	47.42	46.56			

Table 9-2 EVS Codec Investigation – VoLTE over IMS

Codec Setting	EVS Primary SWB 13.2kbps	EVS Primary SWB 9.6kbps	EVS Primary WB 13.2kbps	EVS Primary WB 5.9kbps	EVS Primary NB 13.2kbps	EVS Primary NB 5.9kbps	Orientation	Band /BW	Channel
ABM1 (dBA/m)	6.22	6.94	6.16	5.84	6.08	6.44	Z(axial)	B2/20M	18900
Frequency Response	PASS	PASS	PASS	PASS	PASS	PASS			
SNR (dB)	47.35	47.45	47.59	48.11	47.66	47.43			

9.3 Radio Configuration

An investigation was performed to determine the modulation and RB configuration to be used for testing. 16QAM, 1RB, 50RB offset was used for the testing as the worst-case configuration for the handset. See below table for comparisons between different radio configurations:

Table 9-3 VoLTE over IMS SNR by Radio Configuration

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	ABM1 [dB(A/m)]	SNR [dB]
1880	18900	20	QPSK	1	0	5.86	46.56
1880	18900	20	QPSK	1	50	5.15	46.66
1880	18900	20	QPSK	1	99	5.38	47.69
1880	18900	20	QPSK	50	0	6.01	47.93
1880	18900	20	QPSK	50	25	6.22	47.78
1880	18900	20	QPSK	50	50	6.23	49.51
1880	18900	20	QPSK	100	0	7.60	50.75
1880	18900	20	16QAM	1	0	5.20	44.79
1880	18900	20	16QAM	1	50	5.32	43.81
1880	18900	20	16QAM	1	99	5.65	44.49
1880	18900	20	16QAM	50	0	7.00	48.17
1880	18900	20	16QAM	50	25	7.28	48.10
1880	18900	20	16QAM	50	50	7.33	47.79
1880	18900	20	16QAM	100	0	7.12	48.58
1880	18900	20	64QAM	1	0	7.25	46.55
1880	18900	20	64QAM	1	50	6.73	47.01
1880	18900	20	64QAM	1	99	7.06	46.72
1880	18900	20	64QAM	50	0	7.28	45.89
1880	18900	20	64QAM	50	25	6.89	47.06
1880	18900	20	64QAM	50	50	7.17	46.37
1880	18900	20	64QAM	100	0	7.63	46.58

10 VoWIFI TEST SYSTEM SETUP AND DUT CONFIGURATION

10.1 Test System Setup for VoWiFI over IMS T-coil Testing

Note1: the yellow highlight section has been approved for reuse.
General Note2:
Regards the protocols, the highlighting section of the test set up, reference levels used, will be re-used in future.

The general test setup used for VoWiFi over IMS, or CMRS WiFi Calling, is shown below. The callbox used when performing VoWiFi over IMS T-coil measurements is a CMW500. The Data Application Unit (DAU) of the CMW500 was used to simulate the IP Multimedia Subsystem (IMS) server. According to C63 and KDB 285076 D02v03, VoWiFi input level is -20dBm0.

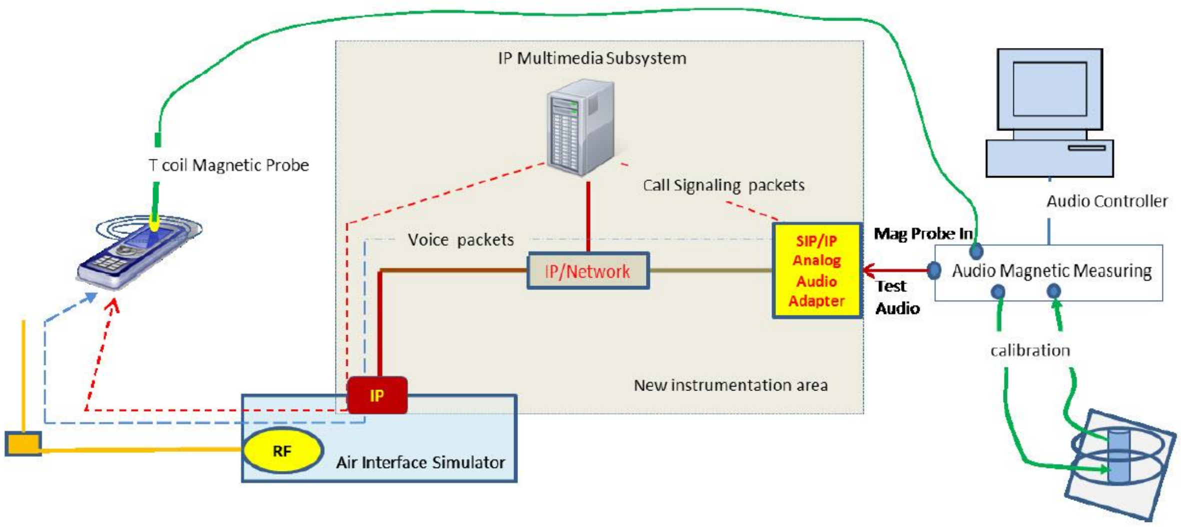


Figure 10.1 Test Setup for VoWiFi over IMS T-coil Measurements

No correction gain factors were measured for VoWiFi due to the Rohde & Schwarz CMW500, hosting a calibrated audio board. The gains used to measure VoWiFi are set to 100.

Firmware	License Keys	Software Name
V3.7.40 for WLAN	KS650	WLAN A/B/G SIG BASIC
	KS651	WLAN N SIG BASIC
	KA100	IP APPL ENABLING IPv4
	KA150	IP APPL ENABLING IPv6
V3.7.20 for Audio	KAA20	IP APPL IMS BASIC
	KM050	DATA APPL MEAS
	KS104	EVS SPEECH CODEC

10.2 Codec Configuration

An investigation was performed to determine the audio codec configuration to be used for testing. The NB AMR 4.75kbps setting was used for the audio codec on the CMW500 for VoWiFi over IMS T-coil testing. See below table for comparisons between different codecs and codec data rates:

Table 10-1 AMR Codec Investigation – VoWiFi over IMS

Codec Setting	WB AMR 23.85kbps	WB AMR 6.60kbps	NB AMR 12.2kbps	NB AMR 4.75kbps	Orientation	Band/BW	Channel
ABM1 (dBA/m)	5.13	5.42	5.31	5.68	Z(axial)	2.4GHz 802.11b	6
Frequency Response	PASS	PASS	PASS	PASS			
SNR (dB)	44.52	45.23	44.95	44.18			

Table 10-2 EVS Codec Investigation – VoWiFi over IMS

Codec Setting	EVS Primary SWB 13.2kbps	EVS Primary SWB 9.6kbps	EVS Primary WB 13.2kbps	EVS Primary WB 5.9kbps	EVS Primary NB 13.2kbps	EVS Primary NB 5.9kbps	Orientation	Band /BW	Channel
ABM1 (dBA/m)	5.36	4.27	4.52	5.75	5.49	4.29	Z(axial)	2.4GHz 802.11b	6
Frequency Response	PASS	PASS	PASS	PASS	PASS	PASS			
SNR (dB)	45.24	45.63	44.81	45.16	44.78	45.43			

10.3 Radio Configuration

An investigation was performed on all applicable data rates and modulations to determine the radio configuration to be used for testing. See below table for comparisons between different radio configurations in each 802.11 standard:

Table10-3 802.11b SNR by Radio Configuration

Mode	Channel	Modulation	Data Rate [Mbps]	ABM1 [dB(A/m)]	SNR [dB]
802.11b	6	DSSS	1	6.15	44.58
802.11b	6	DSSS	2	5.86	45.24
802.11b	6	CCK	5.5	5.27	45.80
802.11b	6	CCK	11	5.55	45.03

Table 10-4 802.11g SNR by Radio Configuration

Mode	Channel	Modulation	Data Rate [Mbps]	ABM1 [dB(A/m)]	SNR [dB]
802.11g	6	BPSK	6	6.20	47.38
802.11g	6	BPSK	9	5.48	48.27
802.11g	6	QPSK	12	5.20	47.91
802.11g	6	QPSK	18	5.29	48.15
802.11g	6	16-QAM	24	4.28	48.04
802.11g	6	16-QAM	36	5.42	48.76
802.11g	6	64-QAM	48	5.81	48.58
802.11g	6	64-QAM	54	6.02	48.42

Table 10-5 802.11n 20MHz BW SNR by Radio Configuration

Mode	Bandwidth [MHz]	Channel	Modulation	Data Rate [Mbps]	ABM1 [dB(A/m)]	SNR [dB]
802.11n	20	6	BPSK	6.5	6.16	44.38
802.11n	20	6	QPSK	13	6.23	44.56
802.11n	20	6	QPSK	19.5	6.58	44.77
802.11n	20	6	16-QAM	26	5.32	45.73
802.11n	20	6	16-QAM	39	5.21	45.29
802.11n	20	6	64-QAM	52	6.73	44.82
802.11n	20	6	64-QAM	58.5	5.38	45.16
802.11n	20	6	64-QAM	65	6.17	45.63

11 HAC T-Coil TEST DATA SUMMARY

11.1 Test Results for 2/3G

Table 11-1 Test results for 2/3G

Probe Position	Band	Ch.	Measurement Position (x mm, y mm)	ABM1 (dB A/m)	SNR (dB)	T category
transverse	GSM 850	190	-4.6,12.9	-3.63	38.24	T4
	GSM 1900	661	-4.2,14.6	-2.97	39.62	T4
	WCDMA850	4182	-0.4,-4.6	-3.87	42.48	T4
	WCDMA1900	9400	-3.7,-4.6	-5.26	40.91	T4
	WCDMA1700	1412	-2.9,-4.6	-4.94	40.95	T4
perpendicular	GSM 850	190	2.5,4.6	6.57	42.23	T4
	GSM 1900	661	0.8,3.7	6.53	44.29	T4
	WCDMA850	4182	-3.3,3.7	4.47	46.08	T4
	WCDMA1900	9400	-3.3,7.5	1.70	44.65	T4
	WCDMA1700	1412	-1.2,8.3	4.02	44.93	T4

Note:

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

11.2 Test Results for LTE

Table 11-2 Test results for LTE

Probe Position	Band	Ch.	Bandwidth	Measurement Position (x mm, y mm)	ABM1 (dB A/m)	SNR (dB)	T category
Transverse	LTE B2	18900	1.4M	-4.5,-0.5	-4.47	45.84	T4
			3M	-4.5,-0.5	-4.80	44.34	T4
			5M	-4.5,-0.5	-4.46	44.86	T4
			10M	-4.5,-0.5	-4.37	44.74	T4
			15M	-1.5,-0.5	-1.74	42.96	T4
			20M	-2.5,-0.5	-2.24	42.62	T4
	LTE B4	20175	1.4M	-4.5,-0.5	-4.36	44.47	T4
			3M	-4,-0.5	-4.03	43.30	T4
			5M	-4, -1	-3.74	42.21	T4
			10M	-4, -1	-3.74	41.62	T4
			15M	-4.5, -1	-3.96	41.50	T4
			20M	-4.5, -1	-3.99	41.04	T4
	LTE B5	20525	1.4M	-2,-0.5	-2.42	45.69	T4
			3M	-2,0	-2.68	46.09	T4
			5M	-3.5,0	-3.37	46.67	T4
			10M	-3.5,-0.5	-3.66	45.39	T4
	LTE B12	23095	1.4M	-4.5, -1	-3.87	43.83	T4
			3M	-4, -0.5	-3.65	43.17	T4
			5M	-4, -0.5	-3.63	43.99	T4
			10M	-5, -1	-4.21	42.59	T4
	LTE B14	23330	5M	-4, -0.5	-3.68	43.03	T4
			10M	-2, -0.5	-2.48	42.21	T4
	LTE B30	27710	5M	-4, -1	-3.80	42.33	T4
			10M	-4, -1	-3.81	42.00	T4
Perpendicular	LTE B2	18900	1.4M	-4.5,9	4.16	44.04	T4
			3M	-4.5,8.5	4.52	44.20	T4
			5M	-4.5,8.5	4.70	45.05	T4
			10M	-4.5,8.5	4.67	44.45	T4
			15M	-5,7	5.08	44.21	T4
			20M	-5,7	5.19	43.49	T4
	LTE B4	20175	1.4M	-4.5,9	4.52	45.36	T4
			3M	-5, 9	4.42	45.93	T4
			5M	-4.5, 8	4.83	45.67	T4
			10M	-4.5, 7.5	5.01	44.68	T4
			15M	-4.5, 7	4.95	44.79	T4
			20M	-4.5, 8	4.86	45.23	T4
	LTE B5	20525	1.4M	-1.5,9.5	7.03	50.70	T4
			3M	-4.5,8.5	4.96	47.58	T4
			5M	-4.5,8.5	4.85	46.74	T4
			10M	-4,9	4.83	46.39	T4
	LTE B12	23095	1.4M	-3.5, 8	5.86	47.26	T4
			3M	-4.5, 7.5	5.26	46.53	T4
			5M	-3.5, 8	5.70	46.57	T4

			10M	-2.5, 8.5	6.28	45.89	**T4**
	LTE B14	23330	5M	-4, 7.5	5.42	46.32	**T4**
			10M	-3.5, 8.5	5.75	46.13	**T4**
	LTE B30	27710	5M	-4.5, 7	4.99	45.17	**T4**
			10M	-4.5, 8	5.03	45.44	**T4**

Note:

1. Bluetooth and WiFi function is turn off and microphone is muted.
2. The worse case of each band for signal strength measurement scan plots are presented in Annex B.
3. The volume is adjusted to maximum level during T-Coil testing.

11.3 Test Results for WiFi

Table 11-3 Test results for WiFi

Probe Position	Mode	Ch.	Bandwidth	Measurement Position (x mm, y mm)	ABM1 (dB A/m)	SNR (dB)	Category T ?
Transverse y	**802.11b**	6	20M	-9.5, 12.5	-5.15	42.58	**T4**
	802.11g	6	20M	-6,15	-0.67	44.31	**T4**
	802.11n	6	20M	-9.5, 14	-3.43	41.75	**T4**
Perpendicular z	**802.11b**	6	20M	-5, 8	5.32	48.08	**T4**
	802.11g	6	20M	-4.5, 6.5	6.52	52.59	**T4**
	802.11n	6	20M	-5, 7	6.42	44.56	**T4**

Note:

1. Bluetooth and WiFi function is turn off and microphone is muted.
2. The worse case of each mode for signal strength measurement scan plots are presented in Annex B.
3. The volume is adjusted to maximum level during T-Coil testing.

11.4 Total Measurement Conclusion

Probe Position	Frequency Band(MHz)	ABM1	Frequency Response	T Category
Transverse	GSM 850	Pass	/	T4
	GSM 1900	Pass		T4
	WCDMA850	Pass		T4
	WCDMA1900	Pass		T4
	WCDMA1700	Pass		T4
	LTE B2	Pass		T4
	LTE B4	Pass		T4
	LTE B5	Pass		T4
	LTE B12	Pass		T4
	LTE B14	Pass		T4
	LTE B30	Pass		T4
	WiFi 2.4G	Pass		T4
Perpendicular	GSM 850	Pass	Pass	T4
	GSM 1900	Pass	Pass	T4
	WCDMA850	Pass	Pass	T4
	WCDMA1900	Pass	Pass	T4
	WCDMA1700	Pass	Pass	T4
	LTE B2	Pass	Pass	T4
	LTE B4	Pass	Pass	T4
	LTE B5	Pass	Pass	T4
	LTE B12	Pass	Pass	T4
	LTE B14	Pass	Pass	T4
	LTE B30	Pass	Pass	T4
	WiFi 2.4G	Pass	Pass	T4

11 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 / DynamicRange	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)		$u_c' = \sqrt{\sum_{i=1}^{20} c_i^2 u_i^2}$						4.1	6.1
Expanded Std. Uncertainty		$u_e = 2u_c$		N	$k = 2$			8.2	12.2

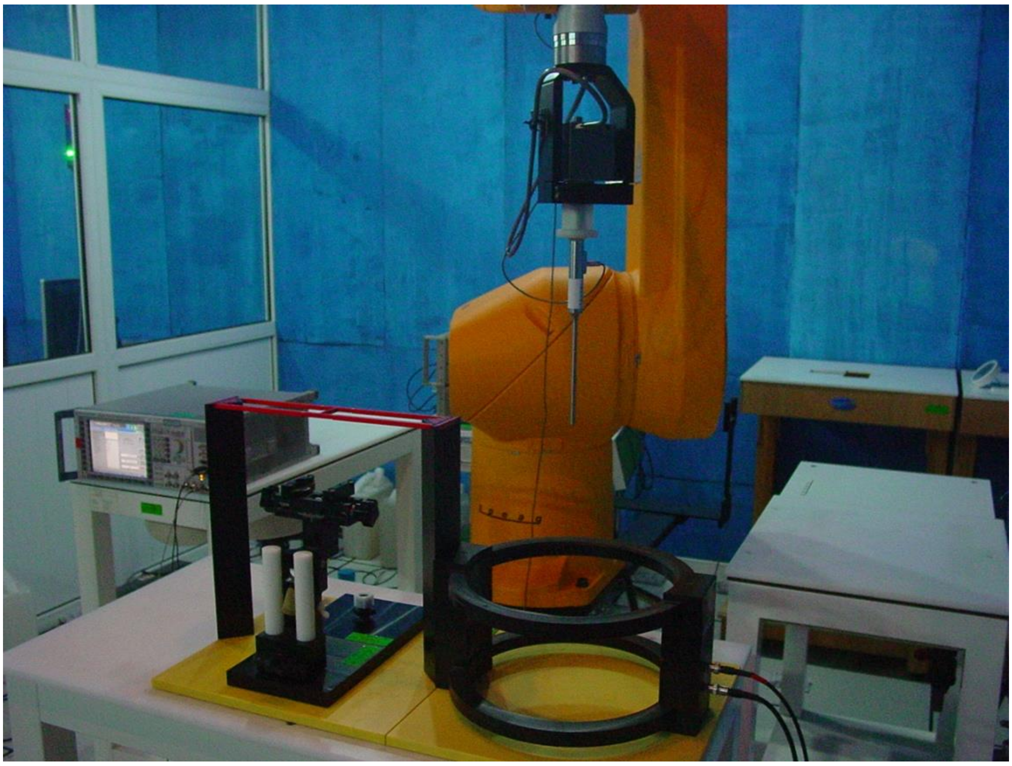
12 MAIN TEST INSTRUMENTS

List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Audio Magnetic 1D Field Probe	AM1DV2	1064	July 23, 2019	One year
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	1555	August 20, 2018	One year
06	DAE	DAE4	1331	February 6, 2019	One year
07	Software	DASY5 V5.0 Build 119.9	N/A	NCR	NCR
08	Software	SEMCAD V13.2 Build 87	N/A	NCR	NCR
09	Universal Radio Communication Tester	CMW 500	166370	June 26, 2019	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 Transverse
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -0.76 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 13.3, 3.7 mm

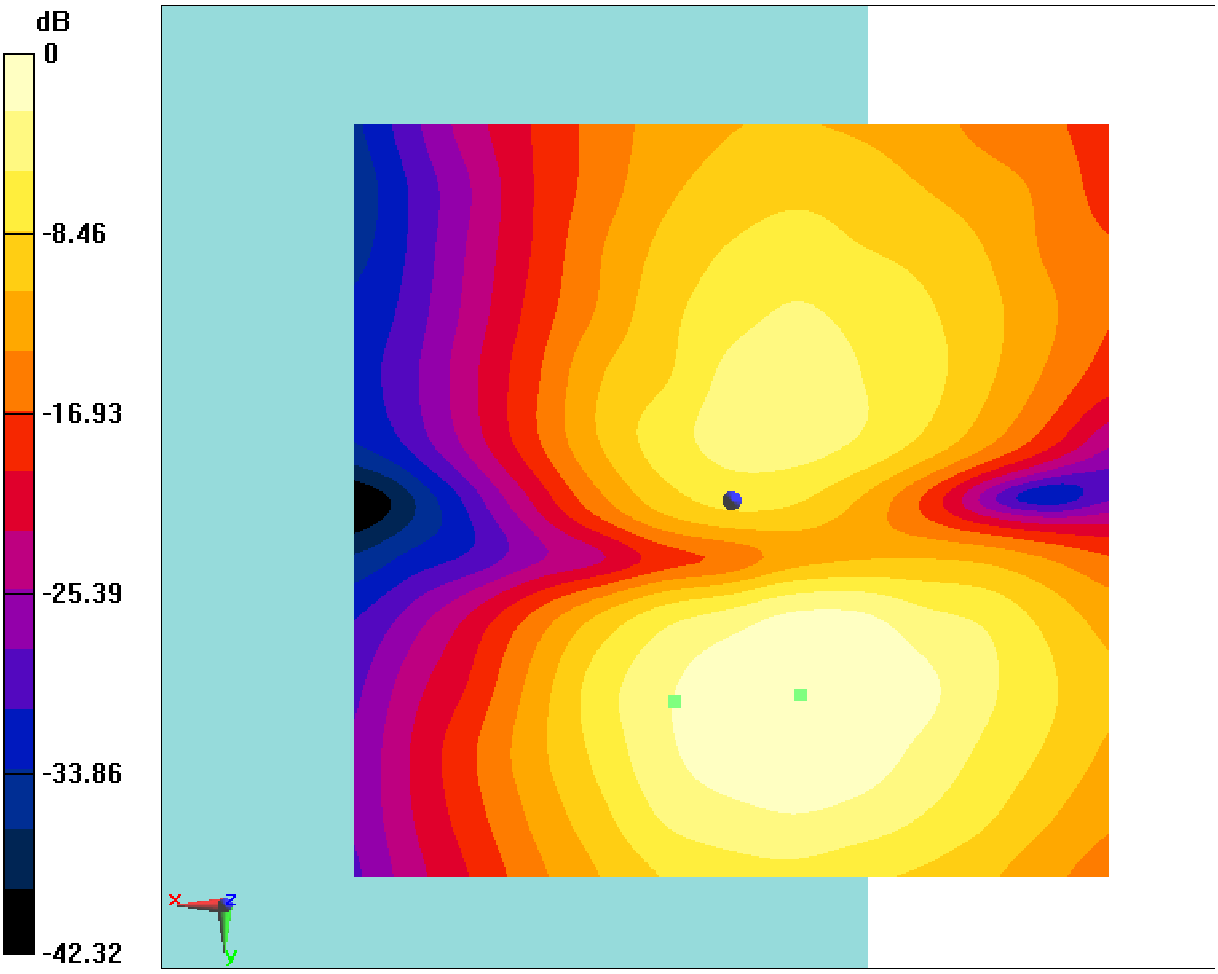
T-Coil/General Scans/y (transversal) 4.2mm 50 x 50/ABM Interpolated

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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 38.24 dB
ABM1 comp = -3.63 dBA/m

BWC Factor = 0.16 dB
Location: -4.6, 12.9, 3.7 mm



0 dB = 0.9160 A/m = -0.76 dBA/m

Fig B.1 T-Coil GSM 850

T-Coil GSM 850 Perpendicular

Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

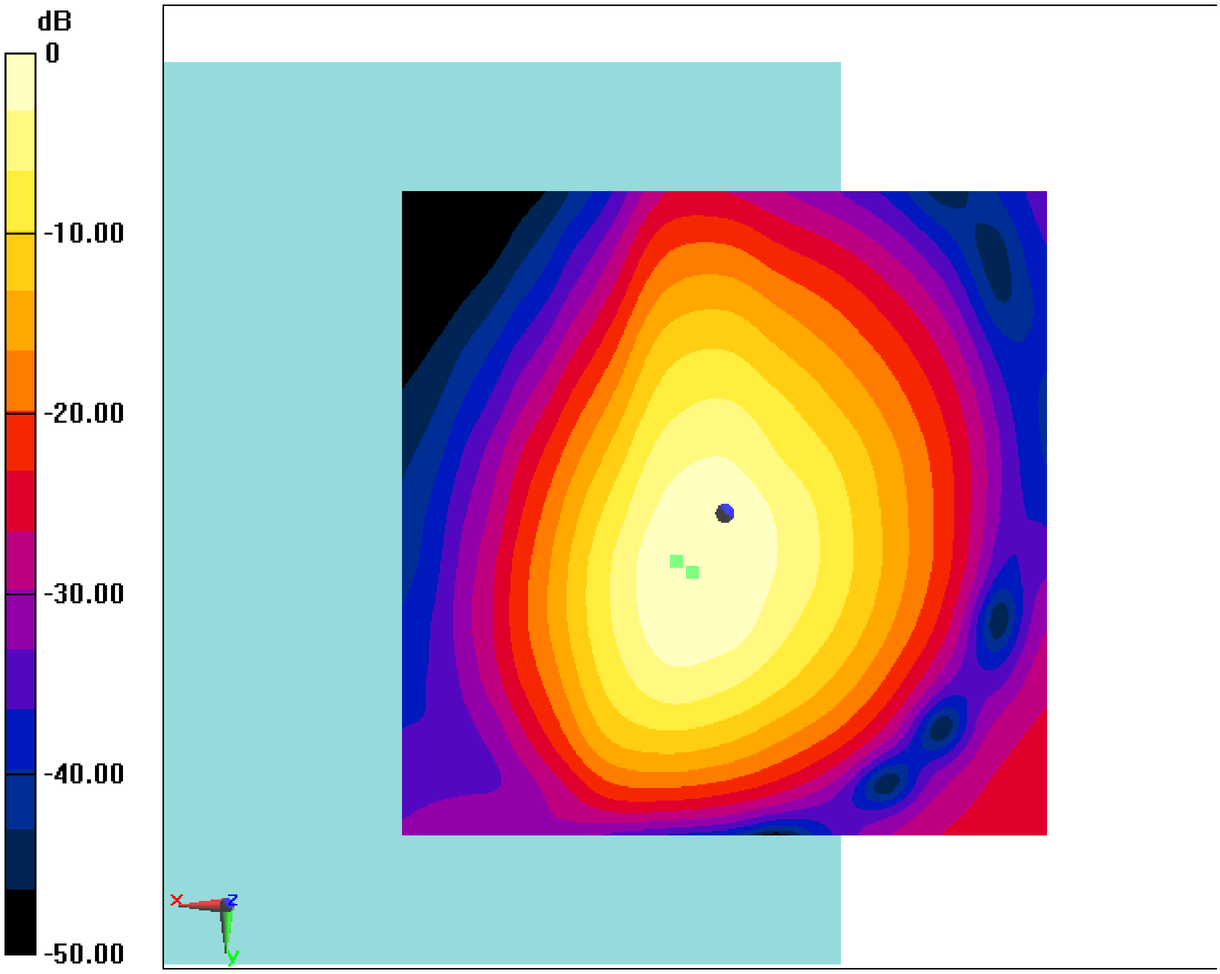
Cursor:
ABM1 = 6.85 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 3.7, 3.7 mm

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 42.23 dB
ABM1 comp = 6.57 dBA/m
BWC Factor = 0.16 dB
Location: 2.5, 4.6, 3.7 mm



0 dB = 2.200 A/m = 6.85 dBA/m

Fig B.2 T-Coil GSM 850

T-Coil GSM 1900 Transverse
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

T-Coil/General Scans/y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

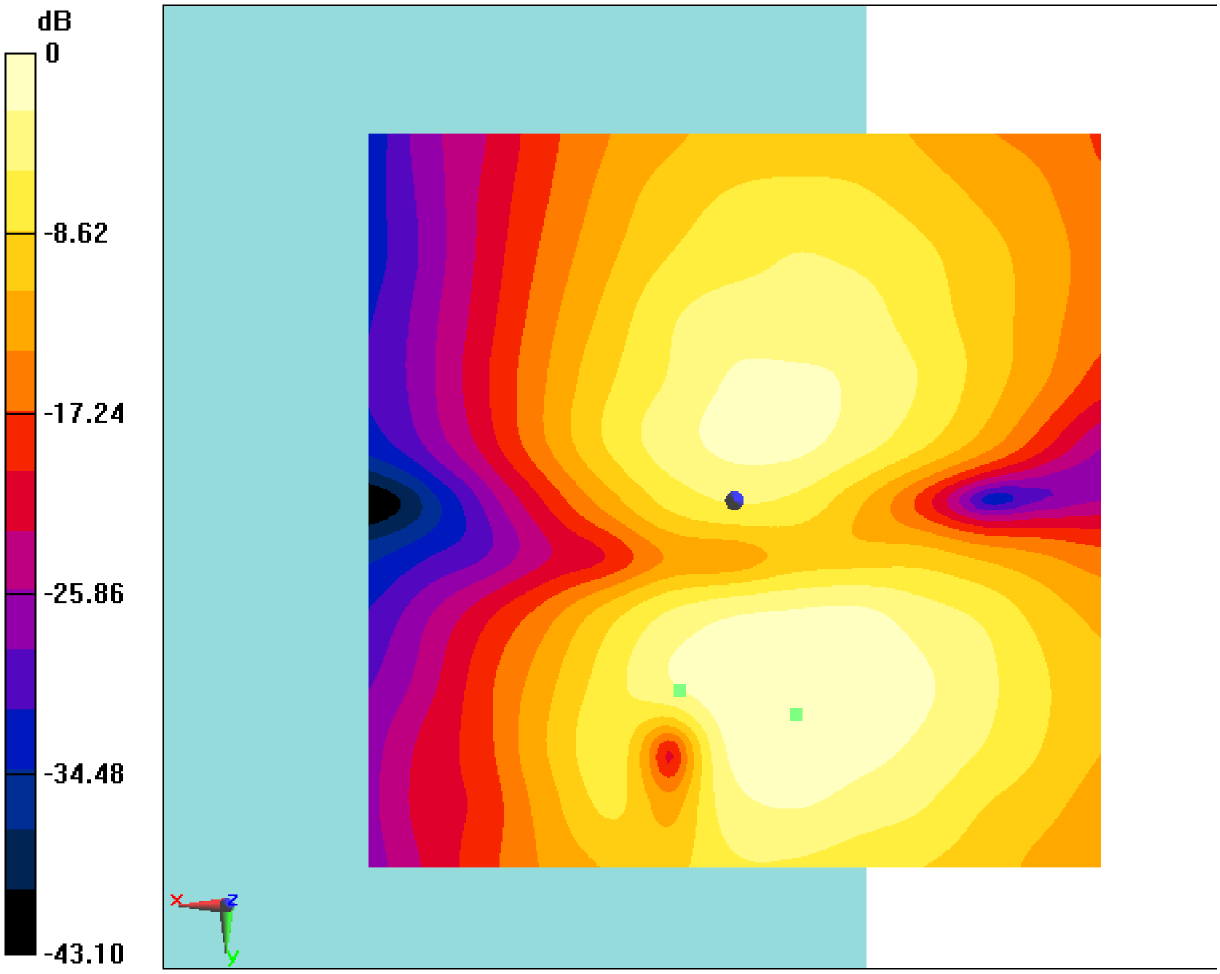
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -0.28 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 12.9, 3.7 mm

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 39.62 dB
ABM1 comp = -2.97 dBA/m
BWC Factor = 0.16 dB
Location: -4.2, 14.6, 3.7 mm



0 dB = 0.9683 A/m = -0.28 dBA/m

Fig B.3 T-Coil GSM 1900

T-Coil GSM 1900 Perpendicular
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: AM1DV2 - 1064;

T-Coil/General Scans/z (axial) 4.2mm 50 x 50 FRV1/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 7.12 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 2.5, 3.7 mm

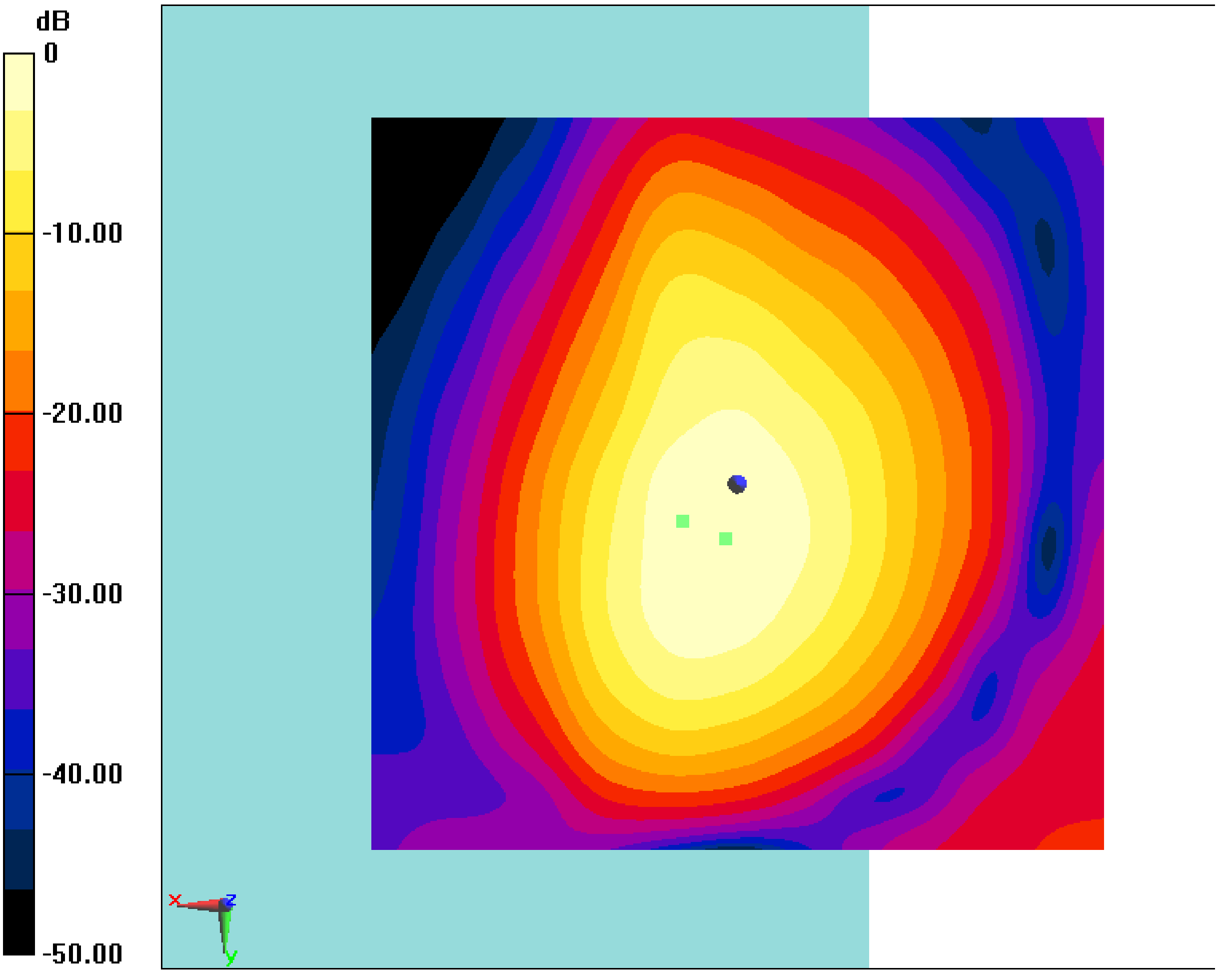
T-Coil/General Scans/z (axial) 4.2mm 50 x 50 FRV1/ABM Interpolated

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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 44.29 dB
ABM1 comp = 6.53 dBA/m

BWC Factor = 0.16 dB
Location: 0.8, 3.7, 3.7 mm



0 dB = 2.271 A/m = 7.12 dBA/m

Fig B.4 T-Coil GSM 1900

T-Coil WCDMA 850 Transverse
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: WCDMA 850; Frequency: 836.4 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/General Scans/y (transversal) 4.2mm 50 x 50 2/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

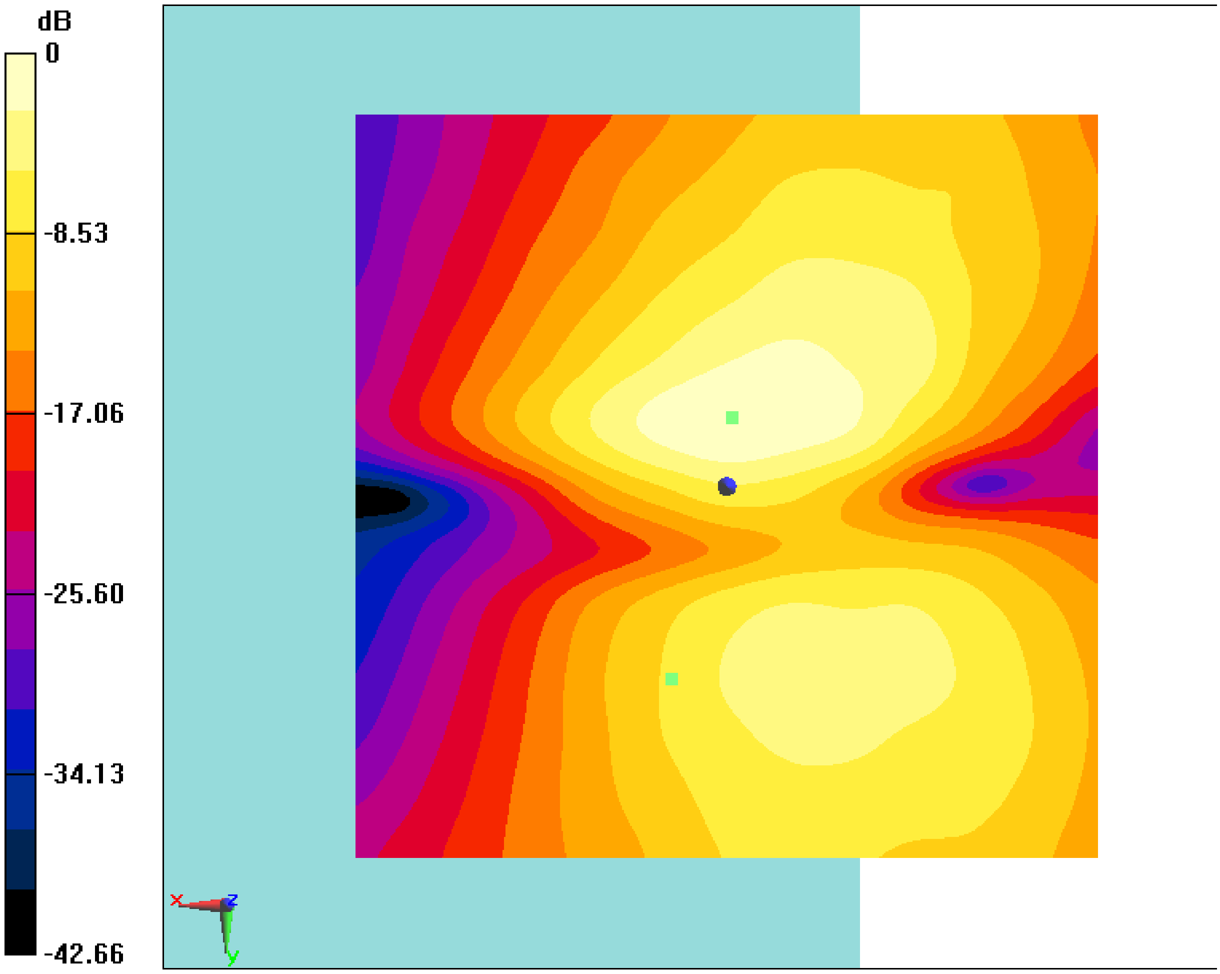
Cursor:
ABM1 = -0.06 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 12.9, 3.7 mm

T-Coil/General Scans/y (transversal) 4.2mm 50 x 50 2/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 42.48 dB
ABM1 comp = -3.87 dBA/m
BWC Factor = 0.16 dB
Location: -0.4, -4.6, 3.7 mm



0 dB = 0.9937 A/m = -0.06 dBA/m

Fig B.5 T-Coil WCDMA 850

T-Coil WCDMA 850 Perpendicular
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: WCDMA 850; Frequency: 836.4 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 7.75 dBA/m
BWC Factor = 0.16 dB
Location: 3.3, 3.7, 3.7 mm

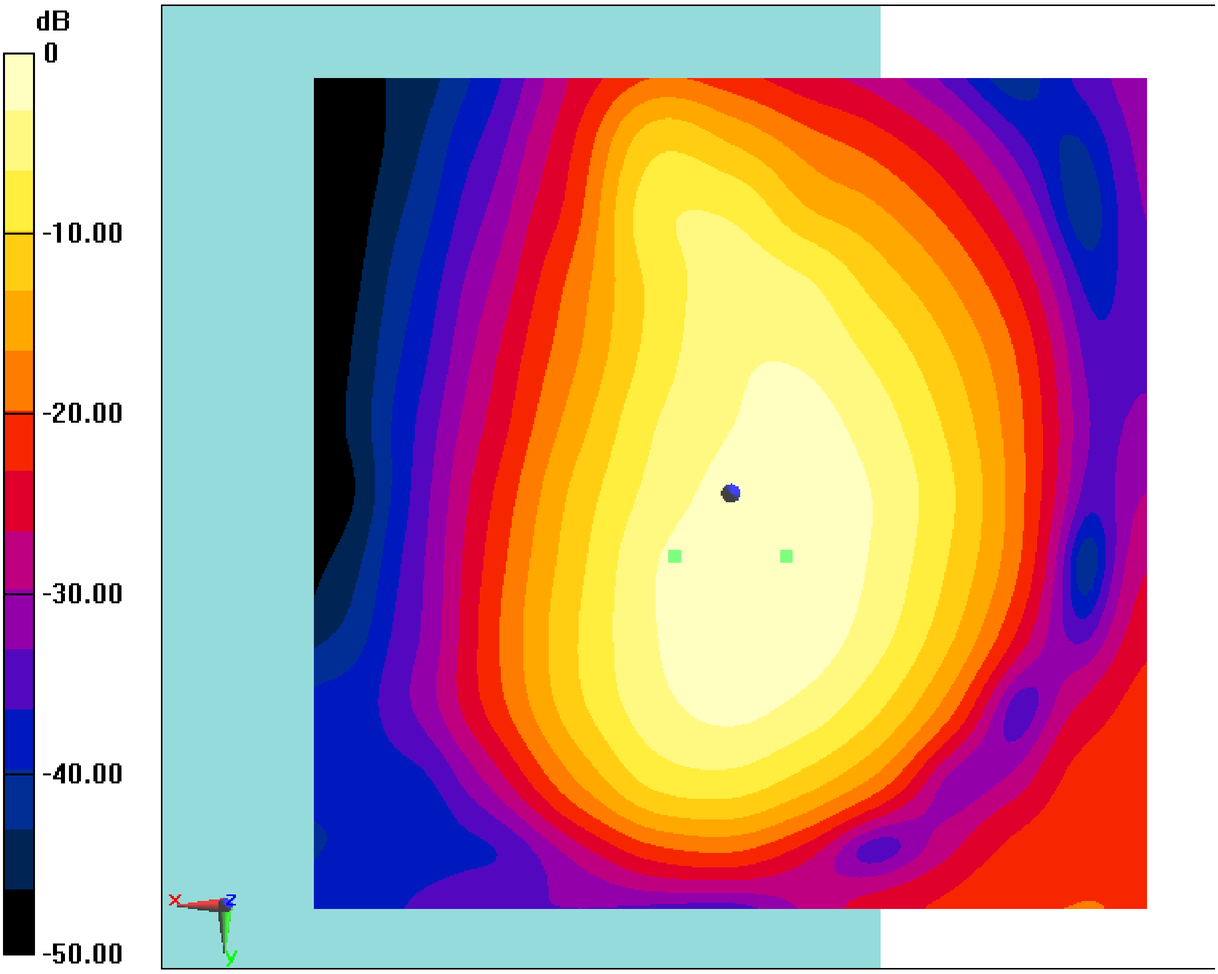
T-Coil/General Scans/z (axial) 4.2mm 50 x 50/ABM Interpolated

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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 46.08 dB
ABM1 comp = 4.47 dBA/m

BWC Factor = 0.16 dB
Location: -3.3, 3.7, 3.7 mm



0 dB = 2.439 A/m = 7.75 dBA/m

Fig B.6 T-Coil WCDMA 850

T-Coil WCDMA 1900 Transverse
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: σ = 0 mho/m, $\varepsilon_r = 1$; ρ = 1 kg/m^3
Ambient Temperature:22.5ºC
Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

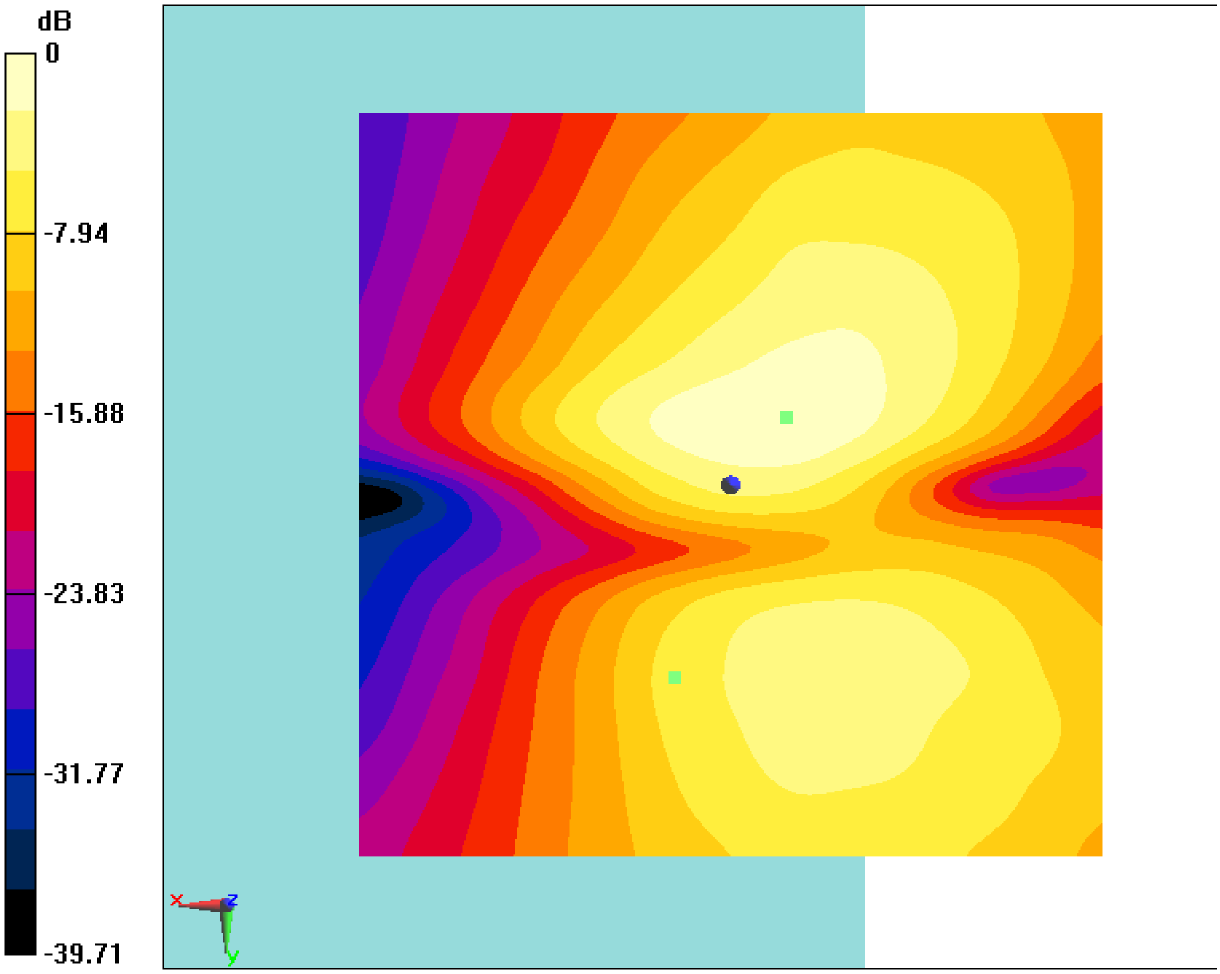
Cursor:
ABM1 = -0.55 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 12.9, 3.7 mm

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 40.91 dB
ABM1 comp = -5.26 dBA/m
BWC Factor = 0.16 dB
Location: -3.7, -4.6, 3.7 mm



0 dB = 0.9383 A/m = -0.55 dBA/m

Fig B.7 T-Coil WCDMA 1900

T-Coil WCDMA 1900 Perpendicular

Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/General Scans/z (axial) 4.2mm 50 x 50 7.95kbps/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

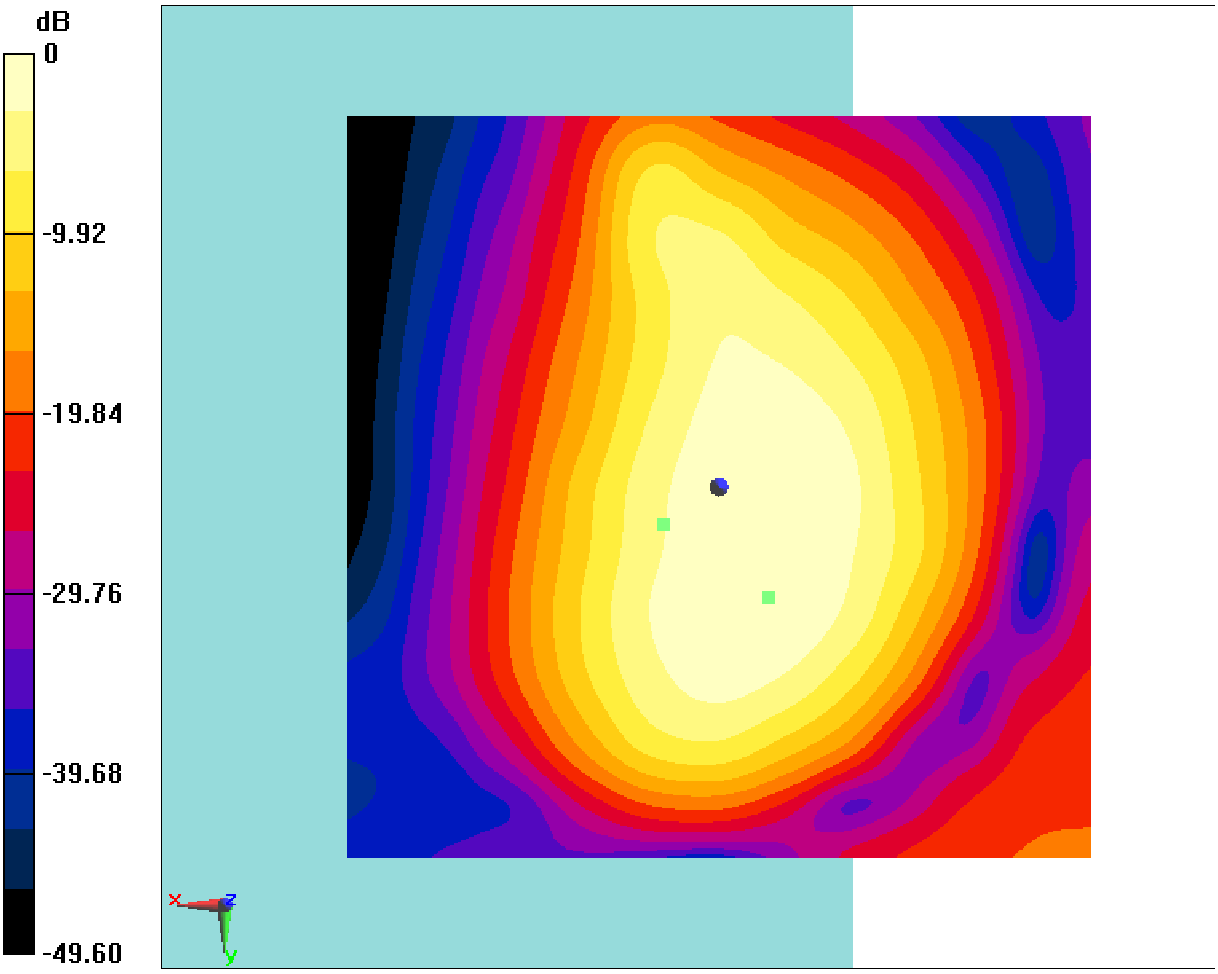
Cursor:
ABM1 = 6.66 dBA/m
BWC Factor = 0.16 dB
Location: 3.8, 2.5, 3.7 mm

T-Coil/General Scans/z (axial) 4.2mm 50 x 50 7.95kbps/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 44.65 dB
ABM1 comp = 1.70 dBA/m
BWC Factor = 0.16 dB
Location: -3.3, 7.5, 3.7 mm



0 dB = 2.153 A/m = 6.66 dBA/m

Fig B.8 T-Coil WCDMA 1900

T-Coil WCDMA 1700 Transverse
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: WCDMA 1700; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/General Scans/y (transversal) 4.2mm 50 x 50/ABM Interpolated

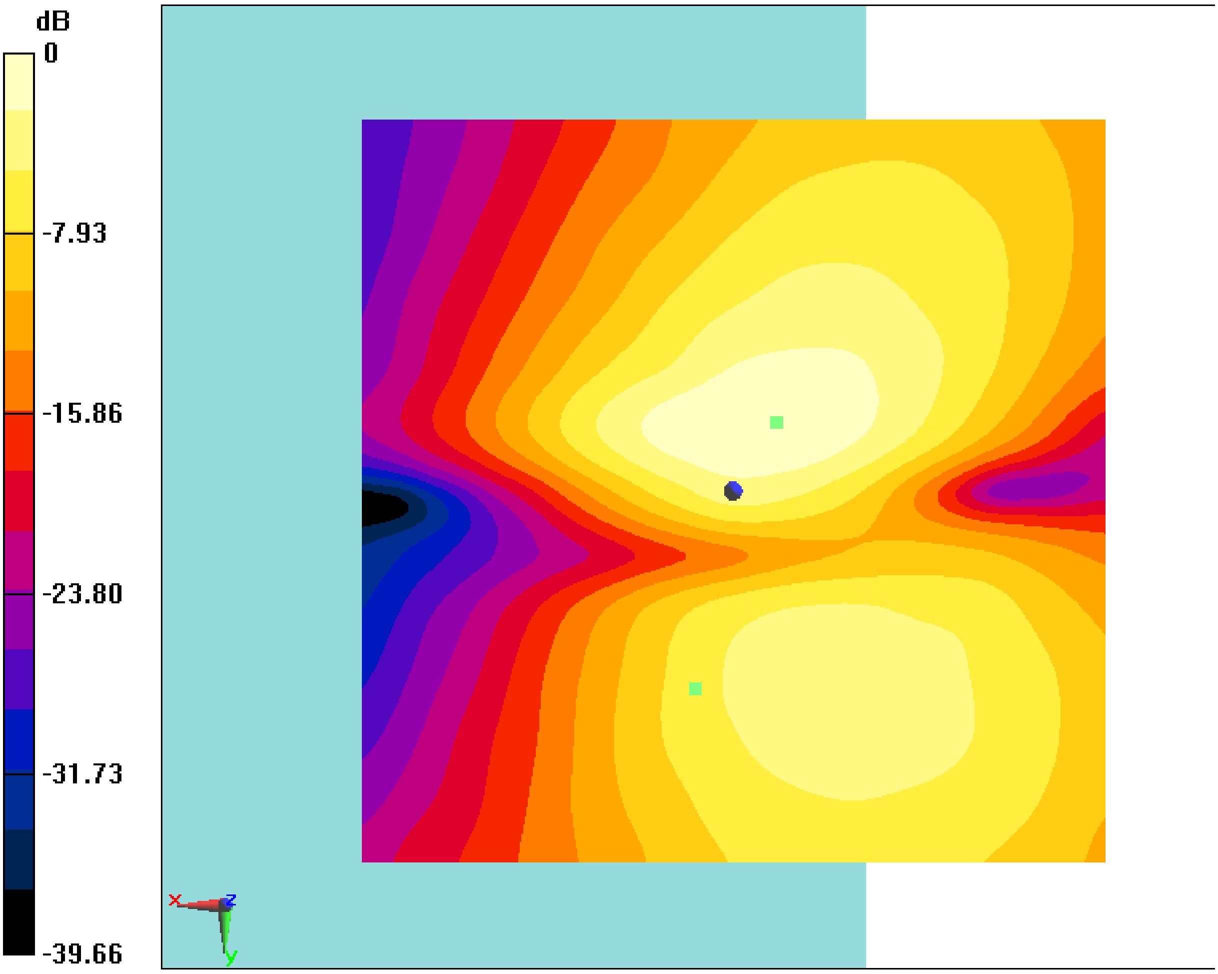
Signal(x,y,z) (121x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = -0.64 dBA/m
BWC Factor = 0.16 dB
Location: 2.5, 13.3, 3.7 mm

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 40.95 dB
ABM1 comp = -4.94 dBA/m
BWC Factor = 0.16 dB
Location: -2.9, -4.6, 3.7 mm



0 dB = 0.9292 A/m = -0.64 dBA/m

Fig B.9 T-Coil WCDMA 1700

T-Coil WCDMA 1700 Perpendicular
Date: 2019-4-29
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: WCDMA 1700; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

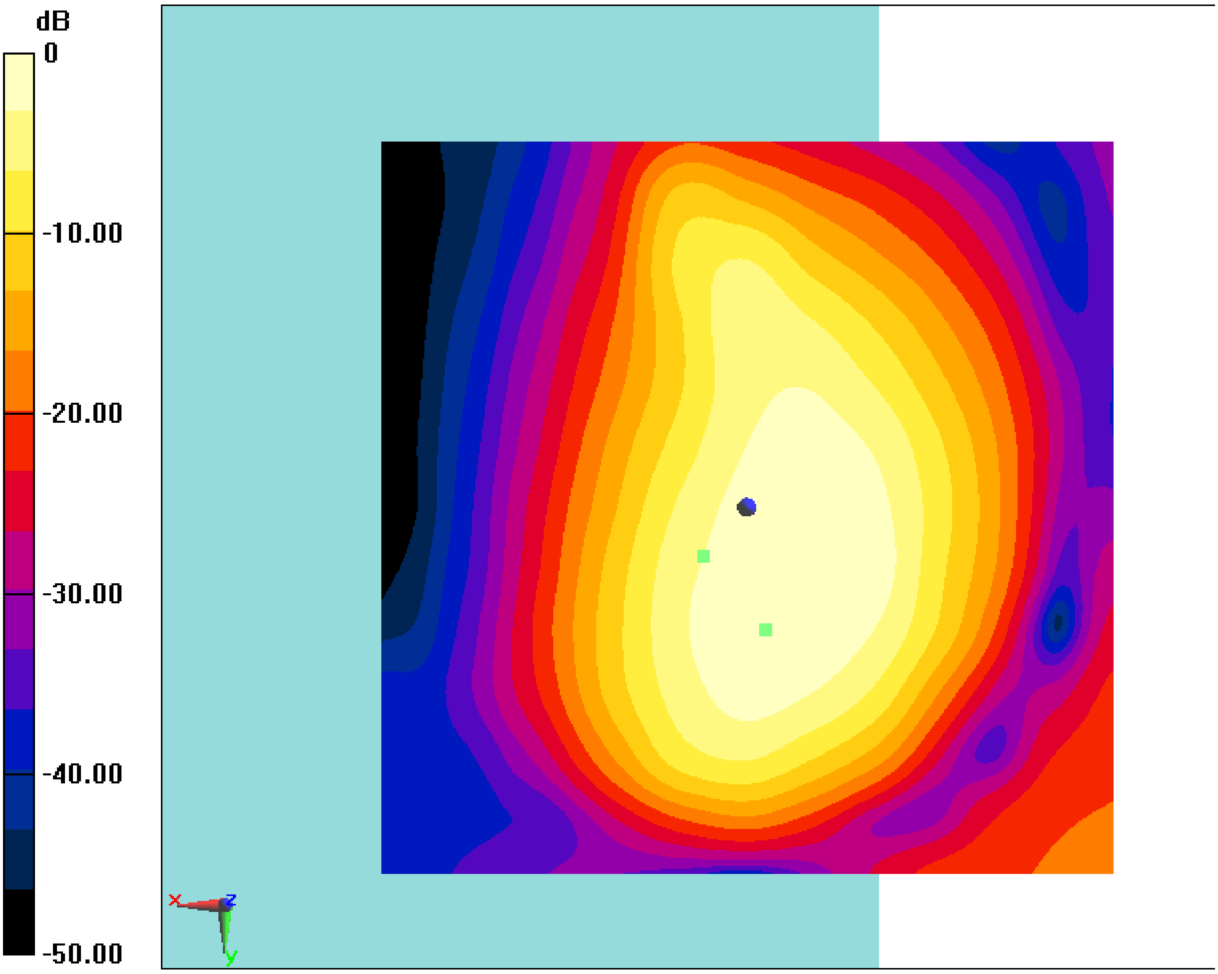
Cursor:
ABM1 = 6.74 dBA/m
BWC Factor = 0.16 dB
Location: 2.9, 3.3, 3.7 mm

T-Coil/General Scans/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: 37.15
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 44.93 dB
ABM1 comp = 4.02 dBA/m
BWC Factor = 0.16 dB
Location: -1.2, 8.3, 3.7 mm



0 dB = 2.173 A/m = 6.74 dBA/m

Fig B.10 T-Coil WCDMA 1700

T-Coil LTE B2 20M Transverse
Date: 2019-5-1
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: LTE B2; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B2 20M 16QAM 1RB50 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

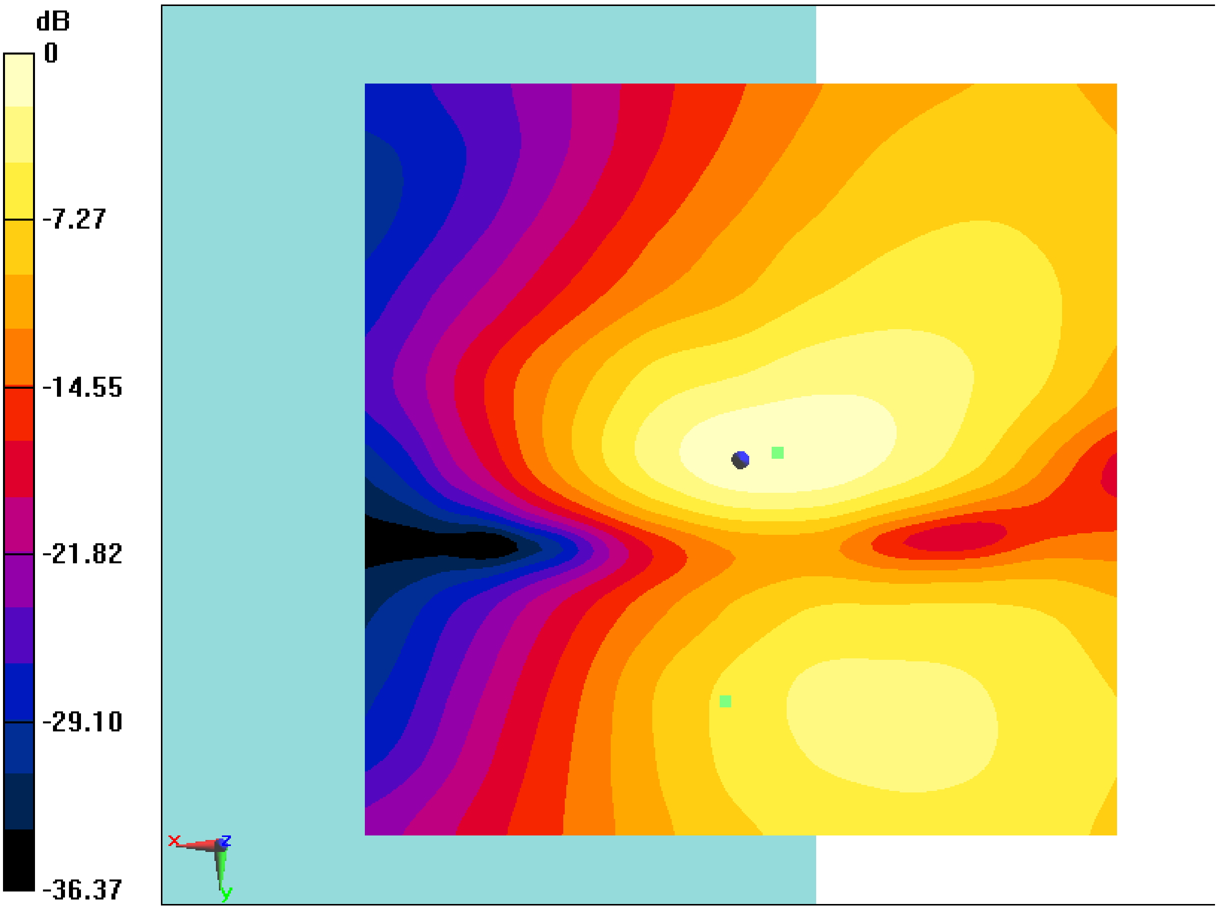
Cursor:
ABM1 = 1.48 dBA/m
BWC Factor = 0.16 dB
Location: 1, 16, 3.7 mm

T-Coil/LTE B2 20M 16QAM 1RB50 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 42.62 dB
ABM1 comp = -2.24 dBA/m

BWC Factor = 0.16 dB
Location: -2.5, -0.5, 3.7 mm



0 dB = 1.185 A/m = 1.48 dBA/m

Fig B.11 T-Coil LTE B2

T-Coil LTE B2 20M Perpendicular
Date: 2019-5-1
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: LTE B2; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B2 20M 16QAM 1RB50 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

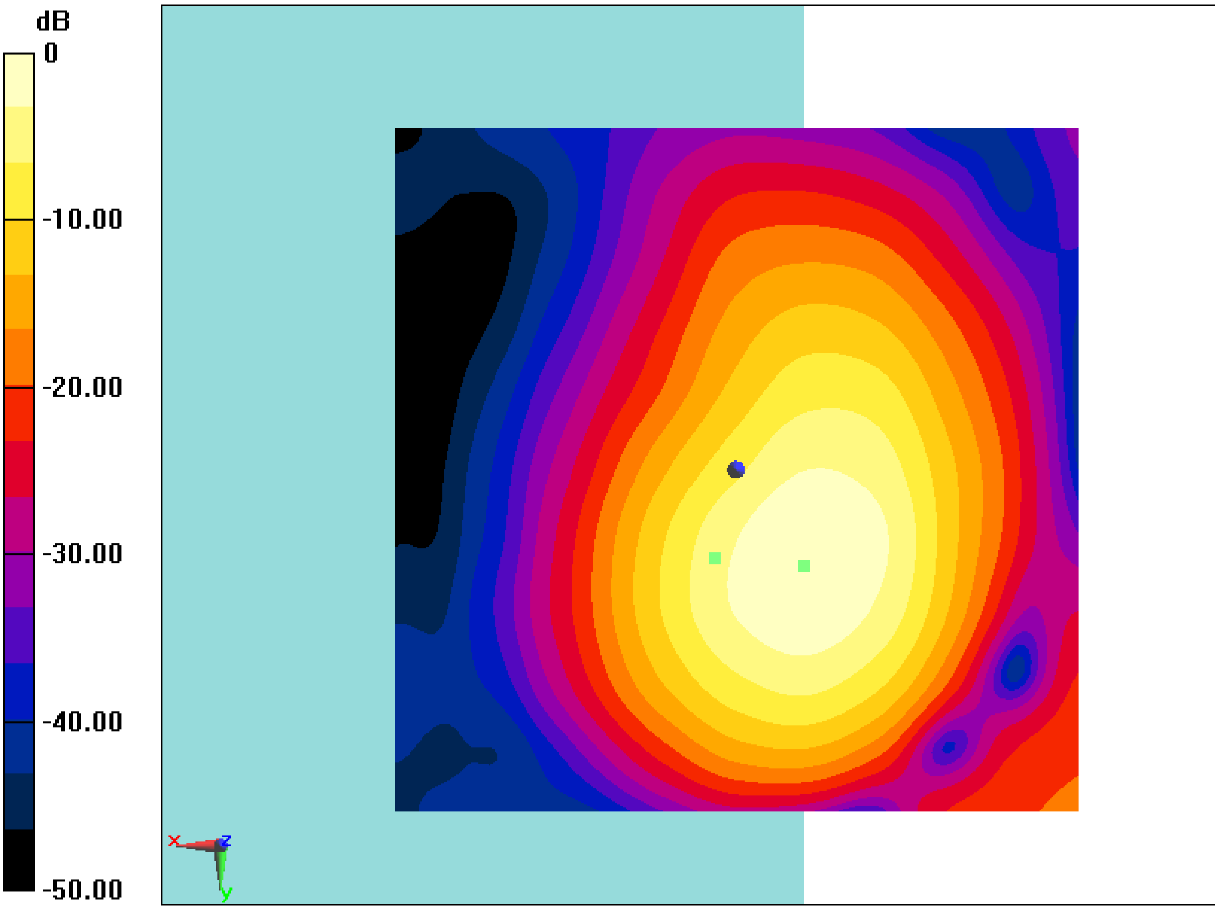
Cursor:
ABM1 = 8.31 dBA/m
BWC Factor = 0.16 dB
Location: 1.5, 6.5, 3.7 mm

T-Coil/LTE B2 20M 16QAM 1RB50 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 43.49 dB

ABM1 comp = 5.19 dBA/m
BWC Factor = 0.16 dB
Location: -5, 7, 3.7 mm



0 dB = 2.603 A/m = 8.31 dBA/m

Fig B.12 T-Coil LTE B2

T-Coil LTE B4 20M Transverse
Date: 2019-5-2
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3
Ambient Temperature:22.5ºC
Communication System: LTE B4; Frequency: 1732.5 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B4 20M 16QAM 1RB50 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

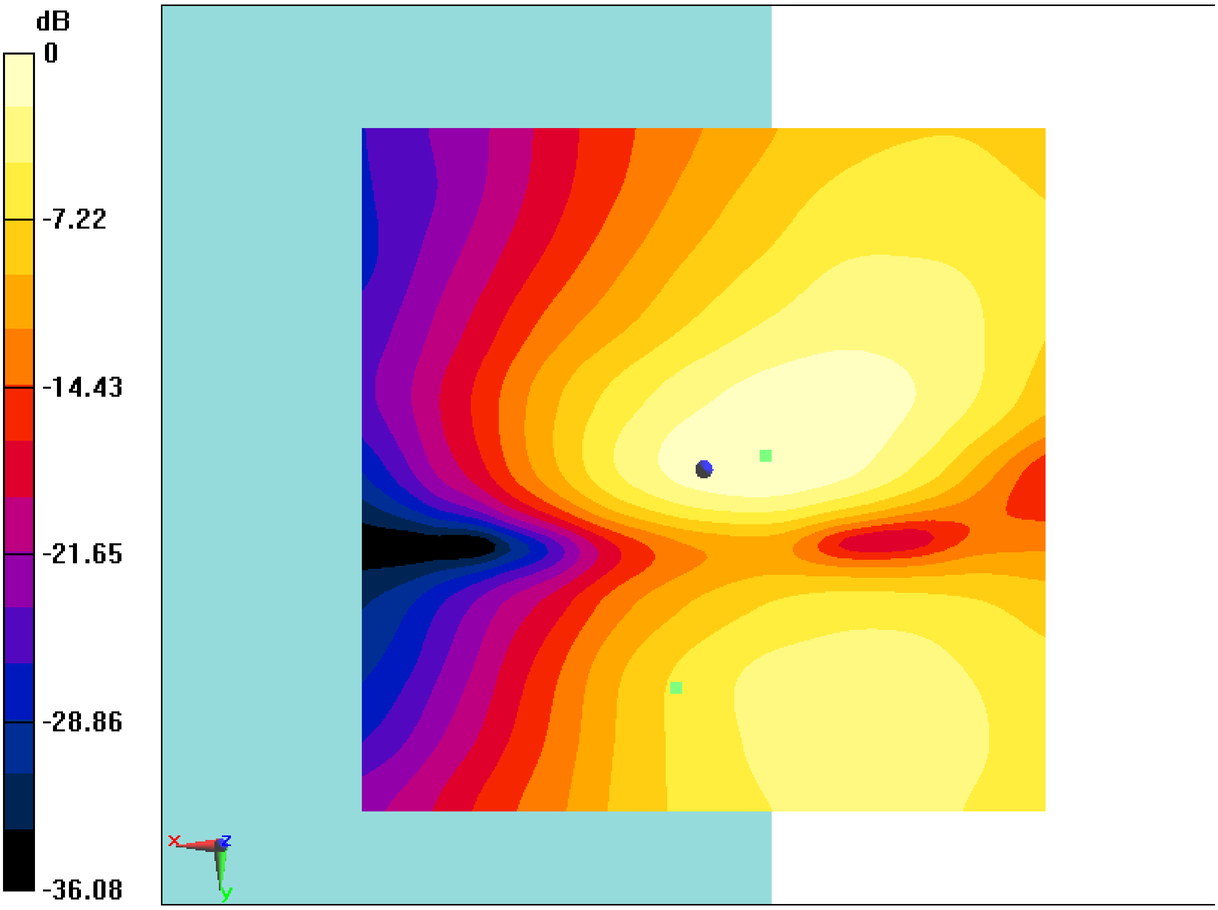
Cursor:
ABM1 = 0.84 dBA/m
BWC Factor = 0.16 dB
Location: 2, 16, 3.7 mm

T-Coil/LTE B4 20M 16QAM 1RB50 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 41.04 dB
ABM1 comp = -3.99 dBA/m

BWC Factor = 0.16 dB
Location: -4.5, -1, 3.7 mm



0 dB = 1.102 A/m = 0.84 dBA/m

Fig B.13 T-Coil LTE B4

T-Coil LTE B4 10M Perpendicular
Date: 2019-5-2
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3
Ambient Temperature:22.5°C
Communication System: LTE B4; Frequency: 1732.5 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B4 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

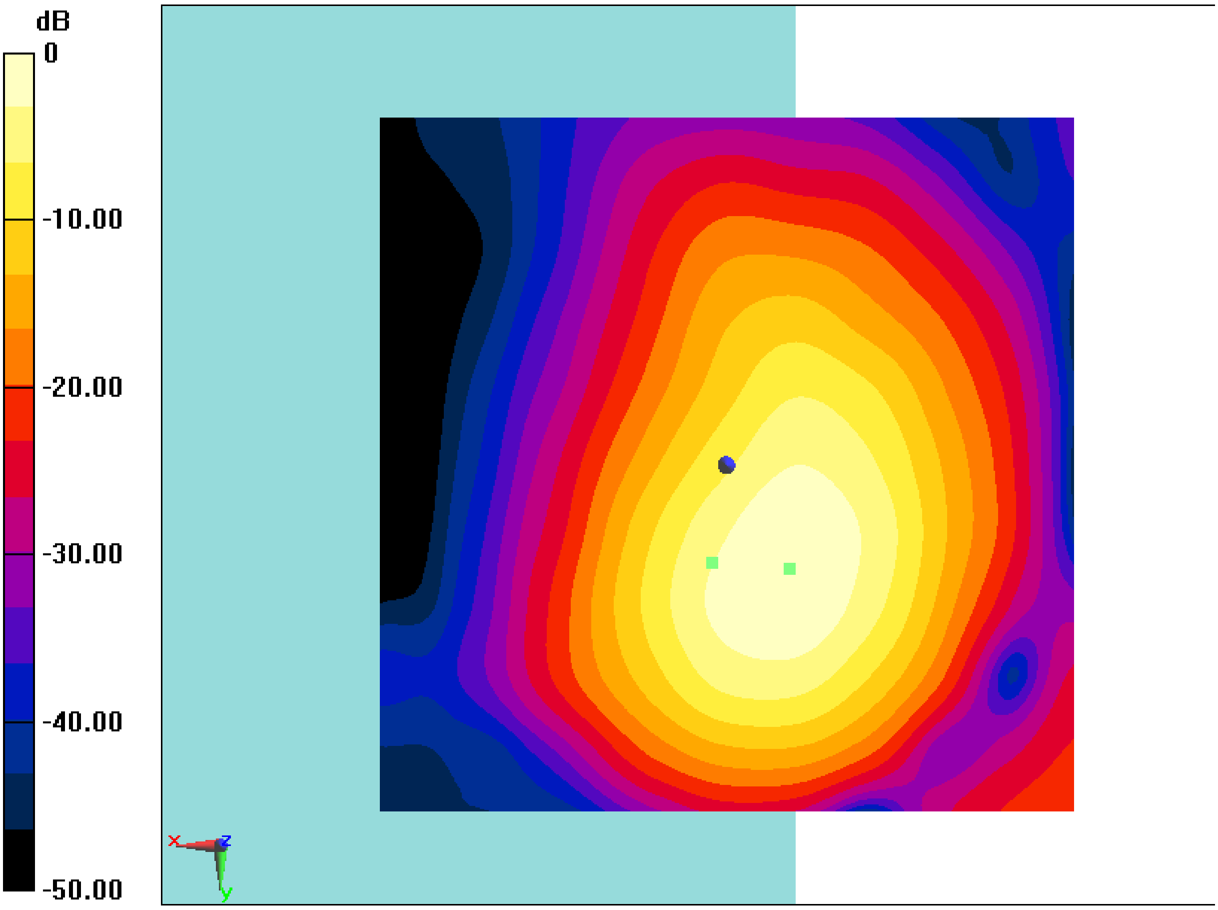
Cursor:
ABM1 = 7.51 dBA/m
BWC Factor = 0.16 dB
Location: 1, 7, 3.7 mm

T-Coil/LTE B4 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 44.68 dB

ABM1 comp = 5.01 dBA/m
BWC Factor = 0.16 dB
Location: -4.5, 7.5, 3.7 mm



0 dB = 2.373 A/m = 7.51 dBA/m

Fig B.14 T-Coil LTE B4

T-Coil LTE B5 10M Transverse
Date: 2019-5-2
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3
Ambient Temperature:22.5ºC
Communication System: LTE B5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B5 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

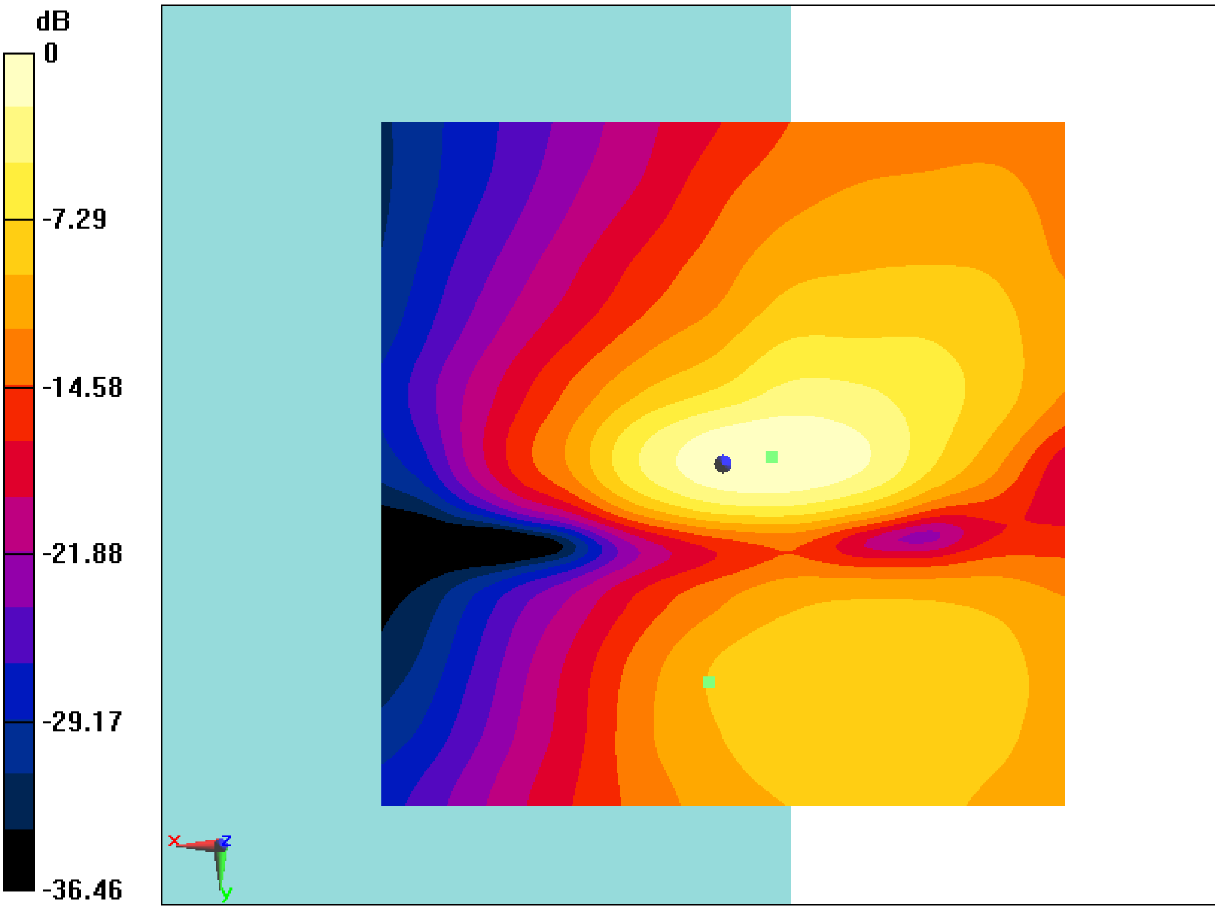
Cursor:
ABM1 = 0.92 dBA/m
BWC Factor = 0.16 dB
Location: 1, 16, 3.7 mm

T-Coil/LTE B5 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 45.39 dB
ABM1 comp = -3.66 dBA/m

BWC Factor = 0.16 dB
Location: -3.5, -0.5, 3.7 mm



0 dB = 1.112 A/m = 0.92 dBA/m

Fig B.15 T-Coil LTE B5

T-Coil LTE B5 10M Perpendicular
Date: 2019-5-2
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: LTE B5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B5 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

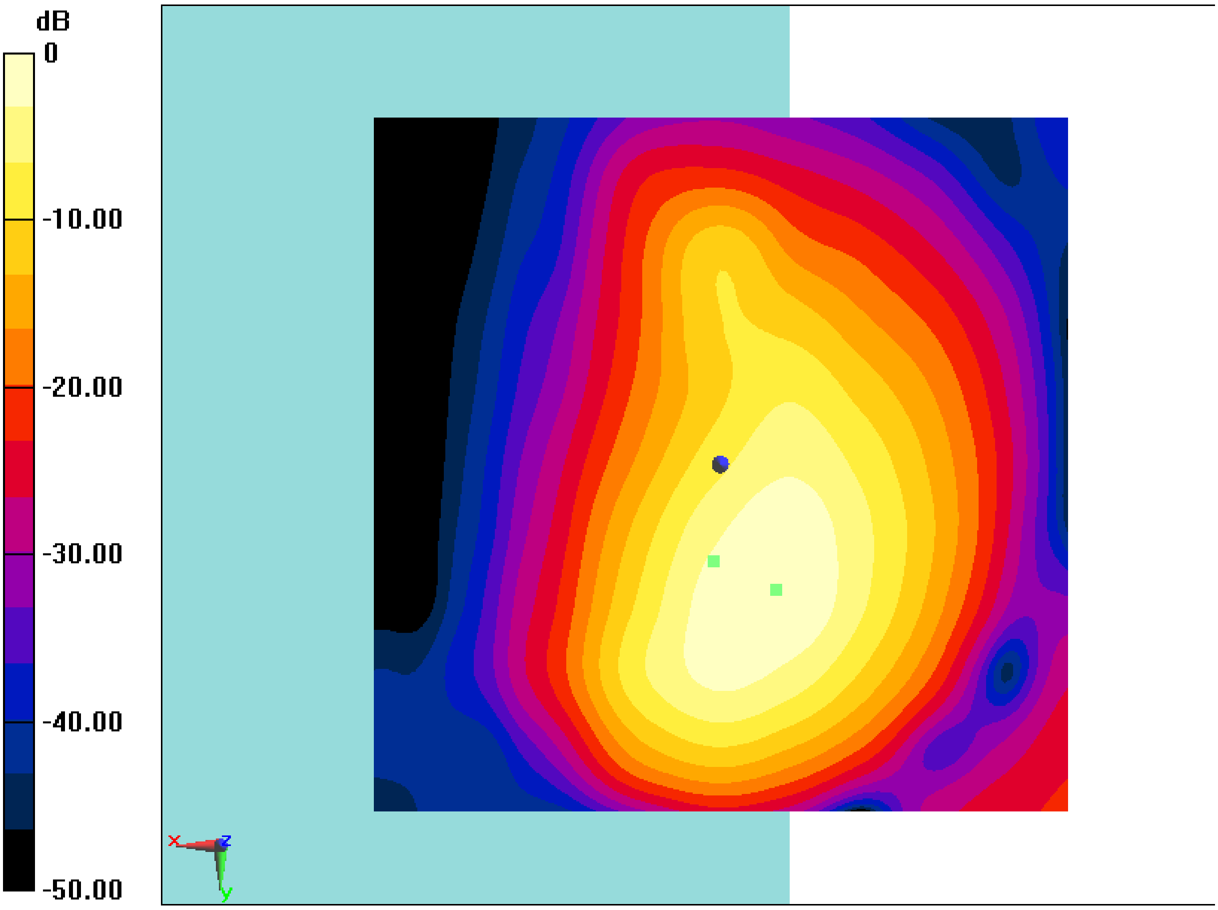
Cursor:
ABM1 = 7.42 dBA/m
BWC Factor = 0.16 dB
Location: 0.5, 7, 3.7 mm

T-Coil/LTE B5 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 46.39 dB

ABM1 comp = 4.83 dBA/m
BWC Factor = 0.16 dB
Location: -4, 9, 3.7 mm



0 dB = 2.350 A/m = 7.42 dBA/m

Fig B.16 T-Coil LTE B5

T-Coil LTE B12 10M Transverse
Date: 2019-5-2
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: LTE B12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B12 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

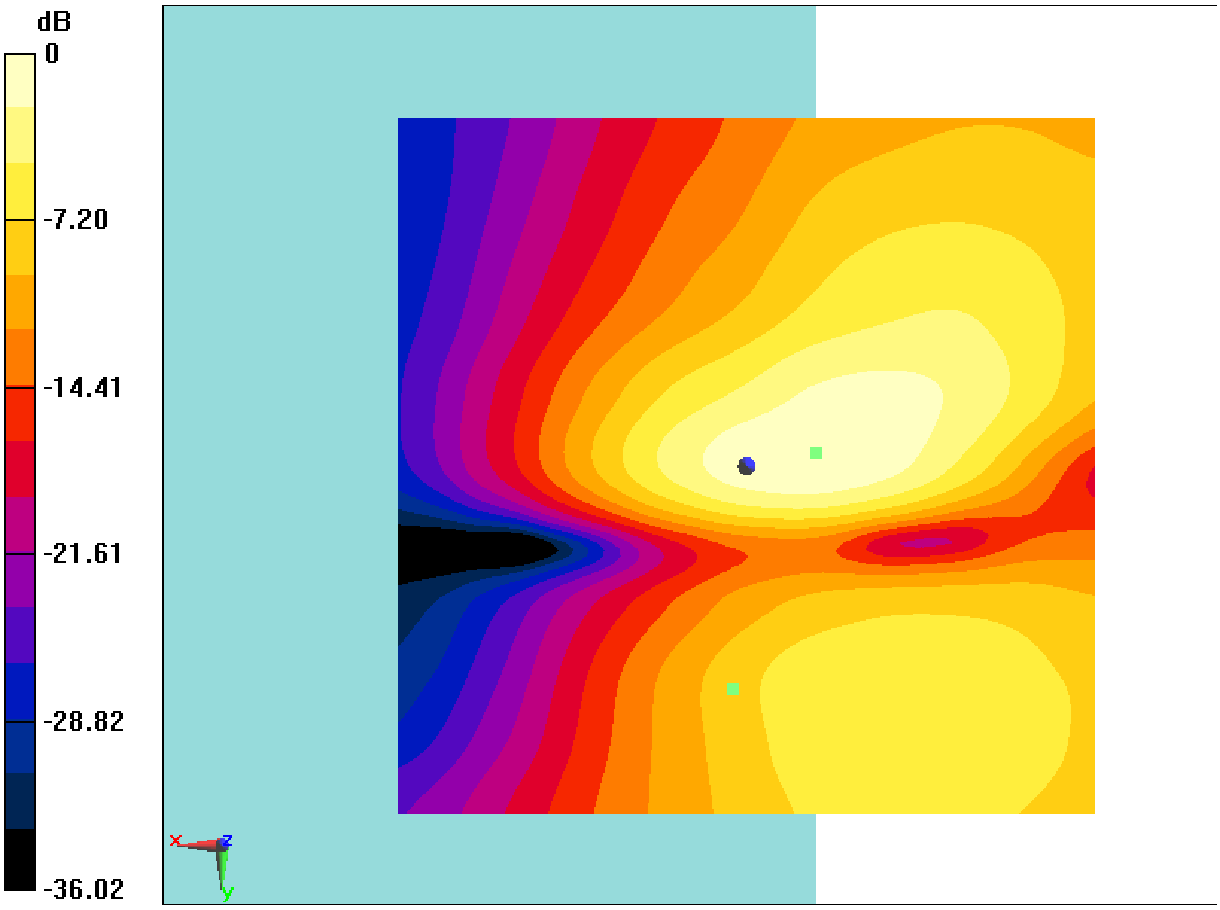
Cursor:
ABM1 = 0.86 dBA/m
BWC Factor = 0.16 dB
Location: 1, 16, 3.7 mm

T-Coil/LTE B12 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 42.59 dB
ABM1 comp = -4.21 dBA/m

BWC Factor = 0.16 dB
Location: -5, -1, 3.7 mm



0 dB = 1.105 A/m = 0.86 dBA/m

Fig B.17 T-Coil LTE B12

T-Coil LTE B12 10M Perpendicular
Date: 2019-5-2
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1 kg/m^3
Ambient Temperature:22.5°C
Communication System: LTE B12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B12 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

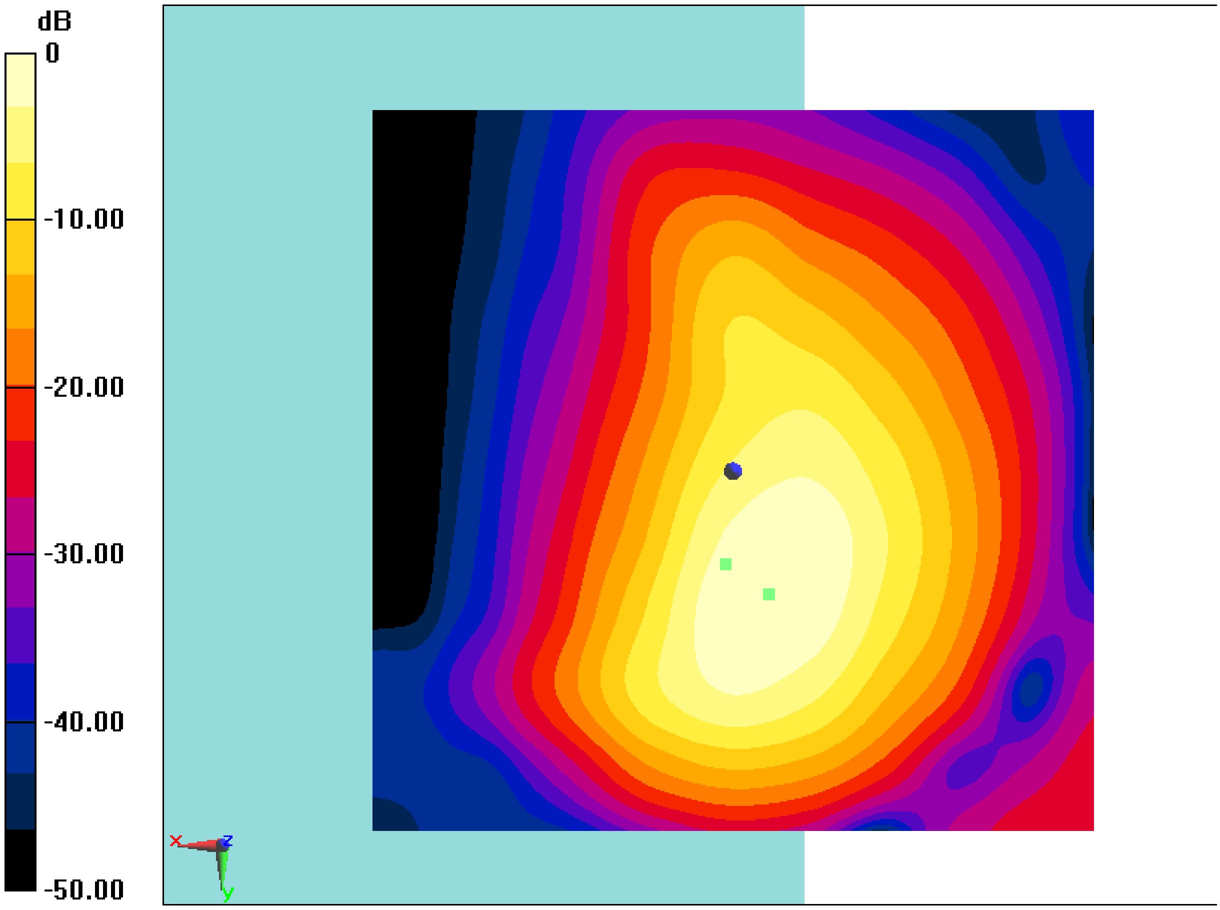
Cursor:
ABM1 = 7.64 dBA/m
BWC Factor = 0.16 dB
Location: 0.5, 6.5, 3.7 mm

T-Coil/LTE B12 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 45.89 dB

ABM1 comp = 6.28 dBA/m
BWC Factor = 0.16 dB
Location: -2.5, 8.5, 3.7 mm



0 dB = 2.411 A/m = 7.64 dBA/m

Fig B.18 T-Coil LTE B12

T-Coil LTE B14 10M Transverse
Date: 2019-5-3
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: LTE B14; Frequency: 793 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B14 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

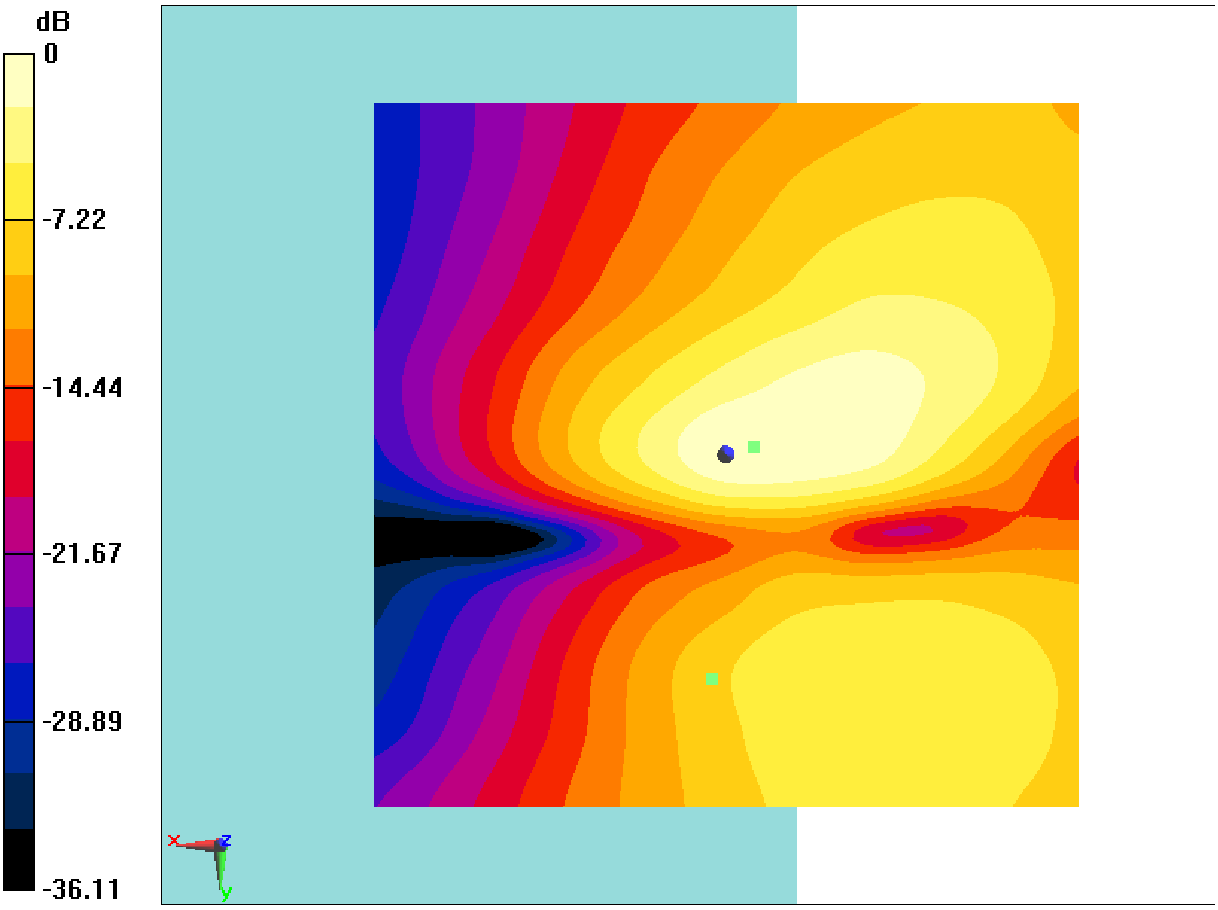
Cursor:
ABM1 = 1.09 dBA/m
BWC Factor = 0.16 dB
Location: 1, 16, 3.7 mm

T-Coil/LTE B14 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 42.21 dB
ABM1 comp = -2.48 dBA/m

BWC Factor = 0.16 dB
Location: -2, -0.5, 3.7 mm



0 dB = 1.133 A/m = 1.09 dBA/m

Fig B.19 T-Coil LTE B14

T-Coil LTE B14 10M Perpendicular
Date: 2019-5-3
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: σ = 0 mho/m, $\varepsilon_r = 1$; ρ = 1 kg/m^3
Ambient Temperature:22.5°C
Communication System: LTE B14; Frequency: 793 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B14 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

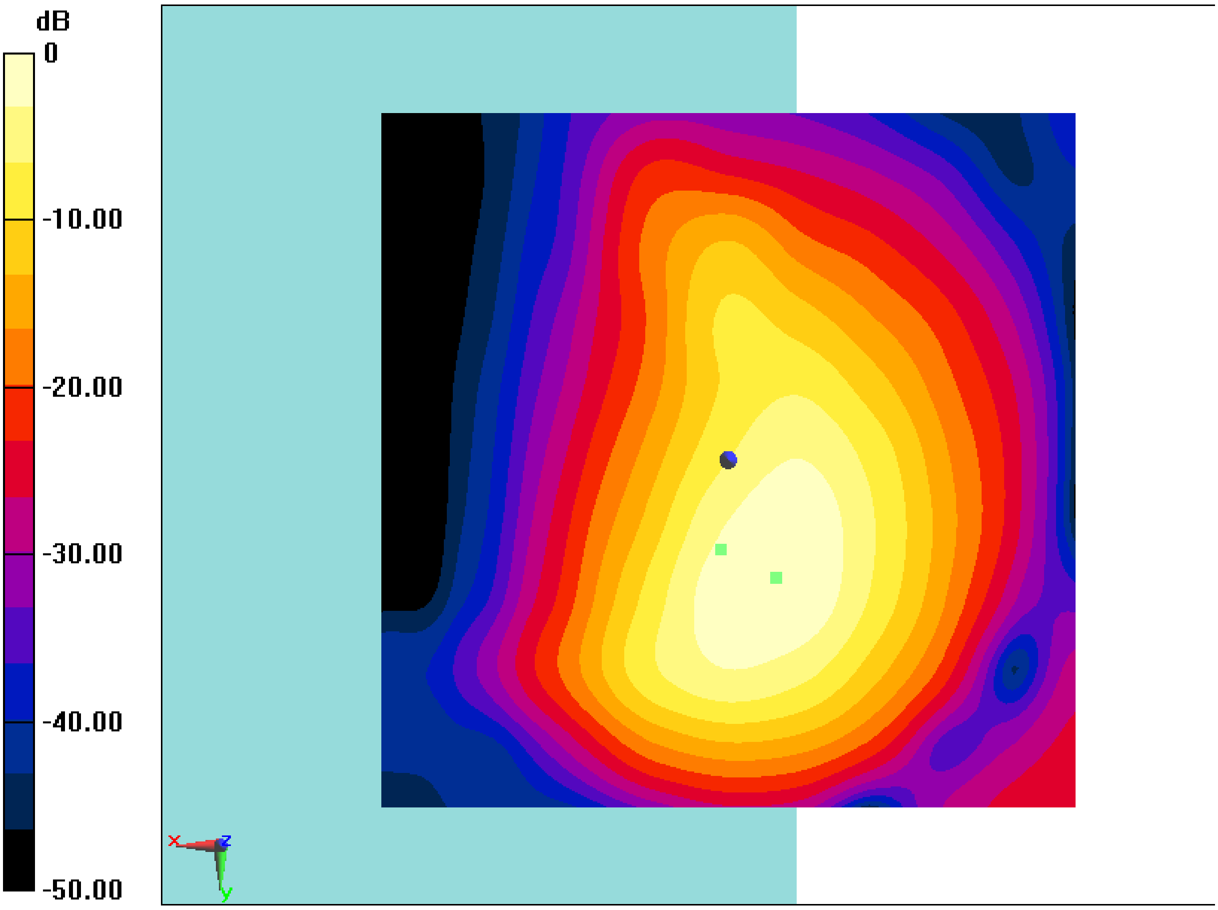
Cursor:
ABM1 = 7.70 dBA/m
BWC Factor = 0.16 dB
Location: 0.5, 6.5, 3.7 mm

T-Coil/LTE B14 10M 16QAM 1RB25 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 46.13 dB

ABM1 comp = 5.75 dBA/m
BWC Factor = 0.16 dB
Location: -3.5, 8.5, 3.7 mm



0 dB = 2.426 A/m = 7.70 dBA/m

Fig B.20 T-Coil LTE B14

T-Coil LTE B30 10M Transverse
Date: 2019-5-3
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: LTE B30; Frequency: 2310 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B30 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

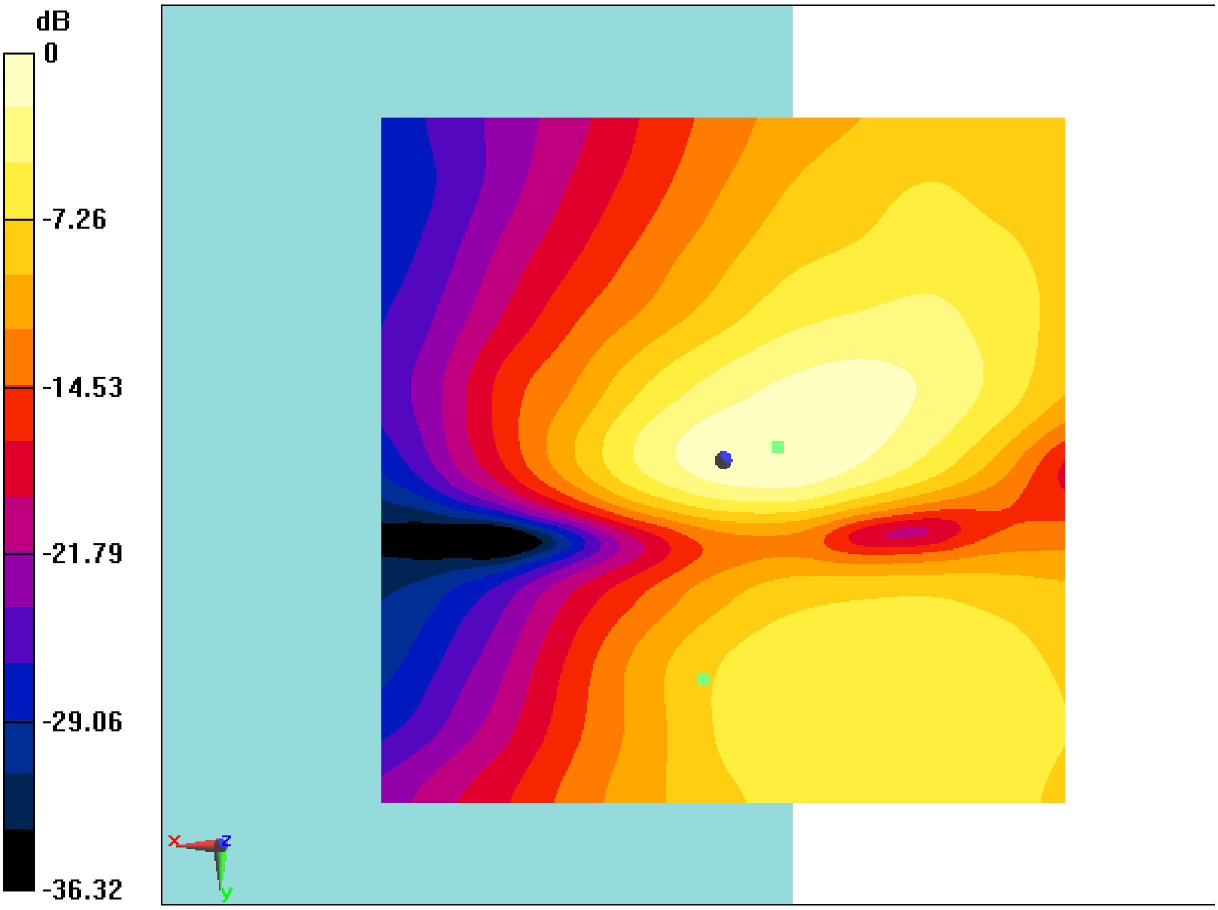
Cursor:
ABM1 = 0.90 dBA/m
BWC Factor = 0.16 dB
Location: 1.5, 16, 3.7 mm

T-Coil/LTE B30 10M 16QAM 1RB25 NB 4.75/y (transversal) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 42.00 dB
ABM1 comp = -3.81 dBA/m

BWC Factor = 0.16 dB
Location: -4, -1, 3.7 mm



0 dB = 1.110 A/m = 0.90 dBA/m

Fig B.21 T-Coil LTE B30

T-Coil LTE B30 5M Perpendicular
Date: 2019-5-3
Electronics: DAE4 Sn1555
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: LTE B30; Frequency: 2310 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

T-Coil/LTE B30 5M 16QAM 1RB12 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated Signal(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

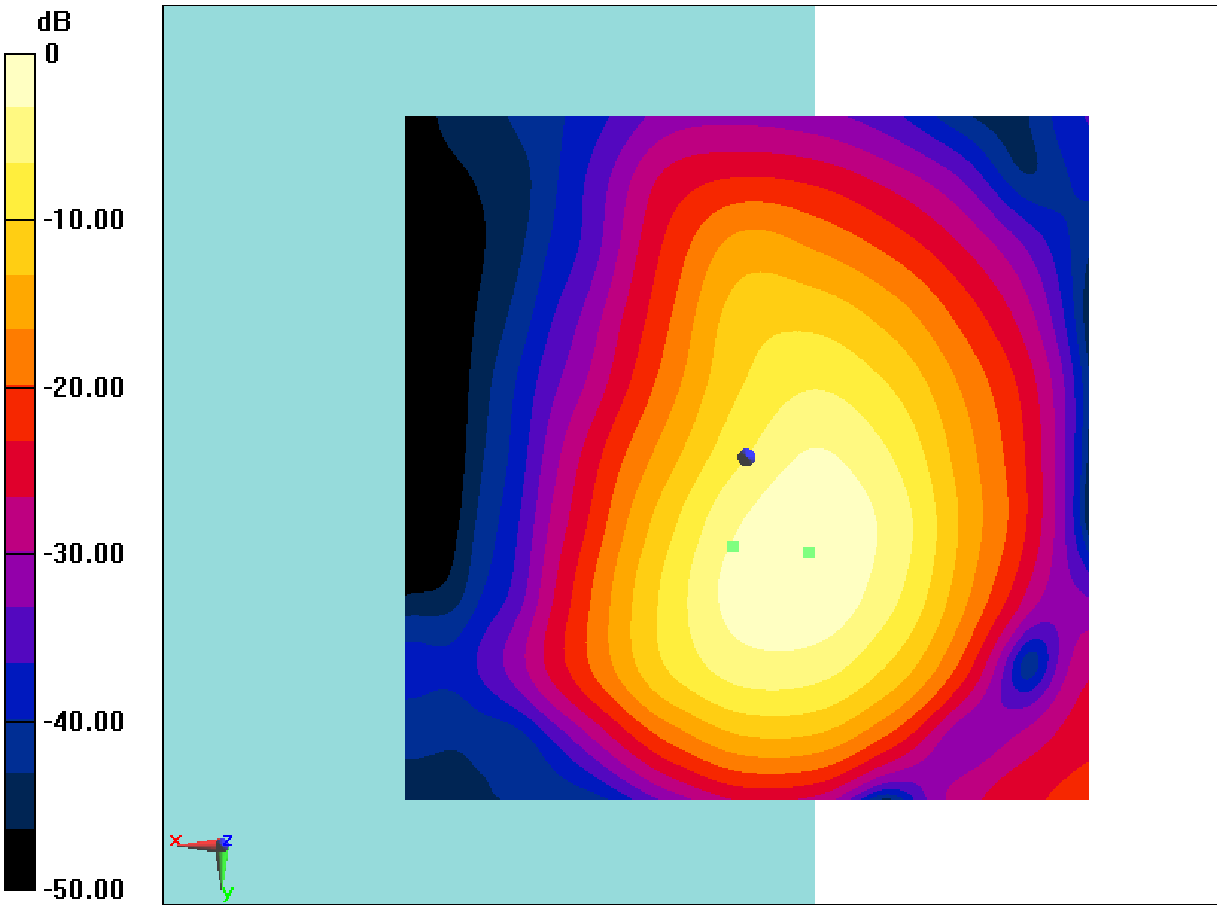
Cursor:
ABM1 = 7.65 dBA/m
BWC Factor = 0.16 dB
Location: 1, 6.5, 3.7 mm

T-Coil/LTE B30 5M 16QAM 1RB12 NB 4.75/z (axial) 4.2mm 50 x 50/ABM

Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.16 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 45.17 dB

ABM1 comp = 4.99 dBA/m
BWC Factor = 0.16 dB
Location: -4.5, 7, 3.7 mm



0 dB = 2.412 A/m = 7.65 dBA/m

Fig B.22 T-Coil LTE B30

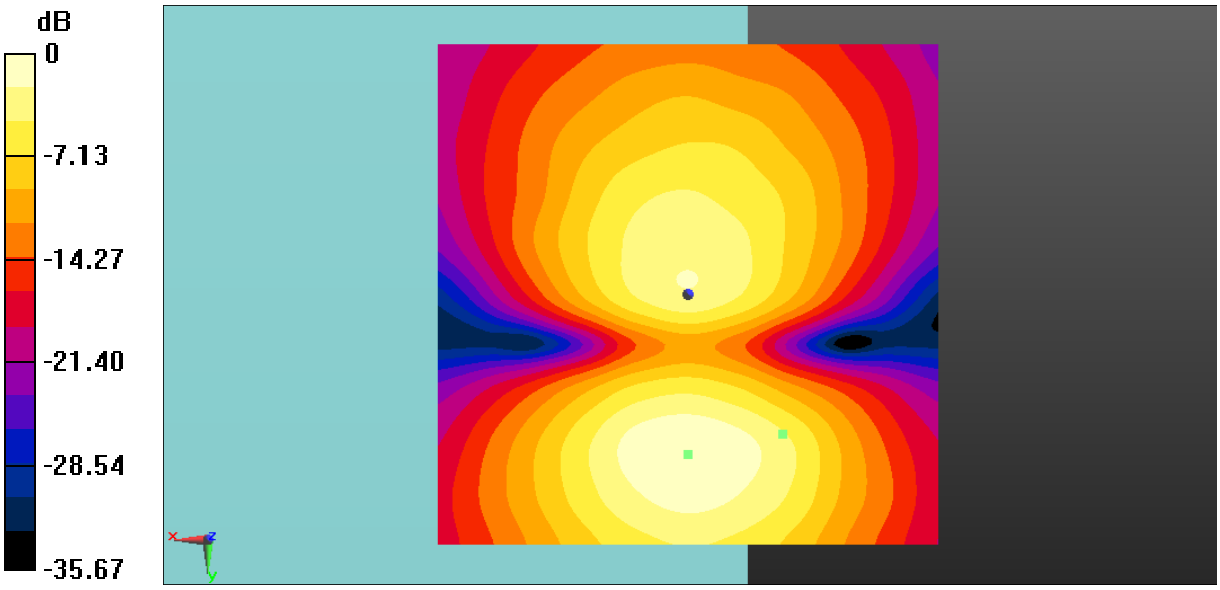
T-Coil WiFi-2.4G 11n Transverse
Date: 2020-1-11
Electronics: DAE4 Sn1331
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5°C
Communication System: WiFi-2.4G; Frequency: 2437 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.17 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 1.04 dBA/m
BWC Factor = 0.17 dB
Location: 0, 16, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.17 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 41.75 dB
ABM1 comp = -3.43 dBA/m
BWC Factor = 0.17 dB
Location: -9.5, 14, 3.7 mm



0 dB = 1.127 A/m = 1.04 dBA/m

Fig B.23 T-Coil WiFi-2.4G

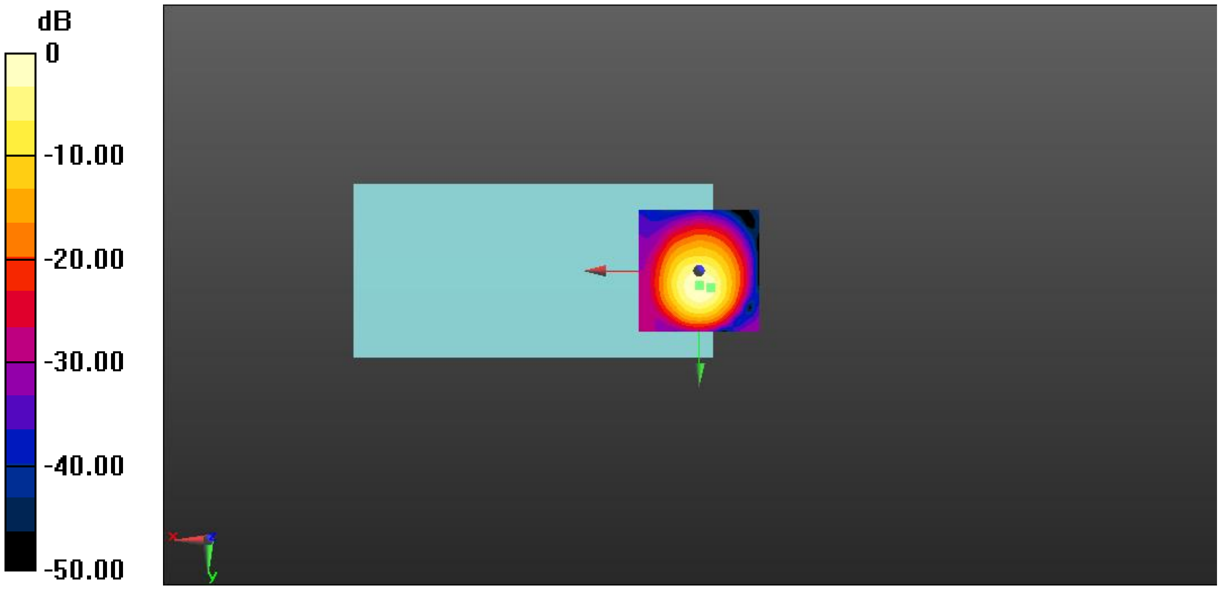
T-Coil WiFi-2.4G 11n Perpendicular
Date: 2020-1-11
Electronics: DAE4 Sn1331
Medium: Air
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature:22.5ºC
Communication System: WiFi-2.4G; Frequency: 2437 MHz; Duty Cycle: 1:1
Probe: AM1DV2 - 1064;

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.17 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1 = 8.37 dBA/m
BWC Factor = 0.17 dB
Location: 0, 6, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav
Output Gain: 100
Measure Window Start: 300ms
Measure Window Length: 1000ms
BWC applied: 0.17 dB
Device Reference Point: 0, 0, -6.3 mm

Cursor:
ABM1/ABM2 = 44.56 dB
ABM1 comp = 6.42 dBA/m
BWC Factor = 0.17 dB
Location: -5, 7, 3.7 mm



0 dB = 2.620 A/m = 8.37 dBA/m

Fig B.24 T-Coil WiFi-2.4G

ANNEX C FREQUENCY REPONSE CURVES

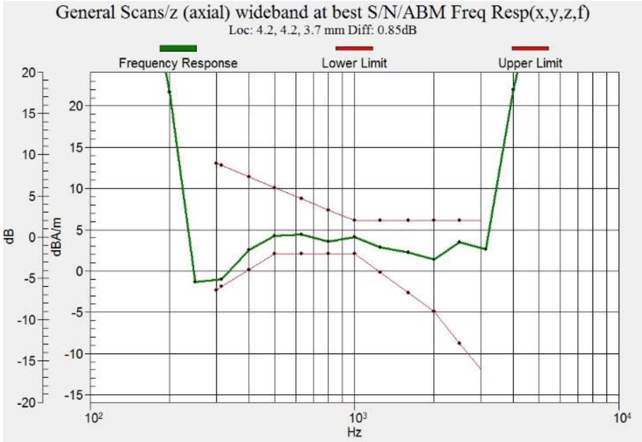


Figure C.1 Frequency Response of GSM 850

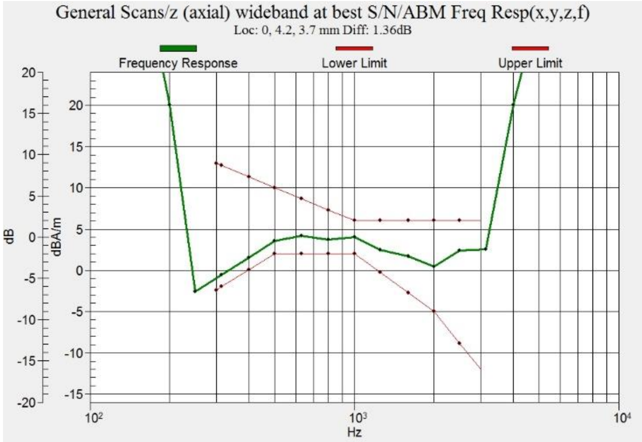


Figure C.2 Frequency Response of GSM 1900

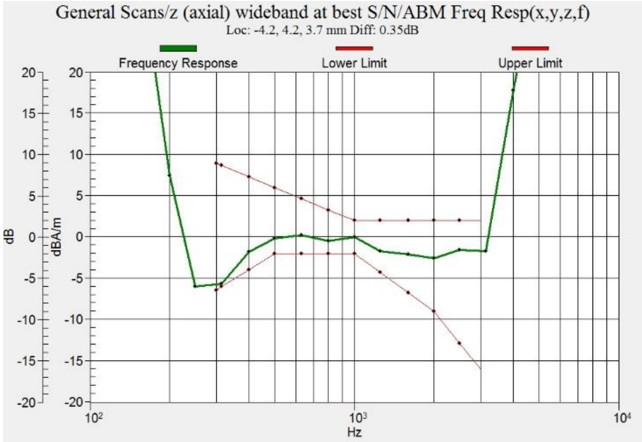


Figure C.3 Frequency Response of WCDMA 850

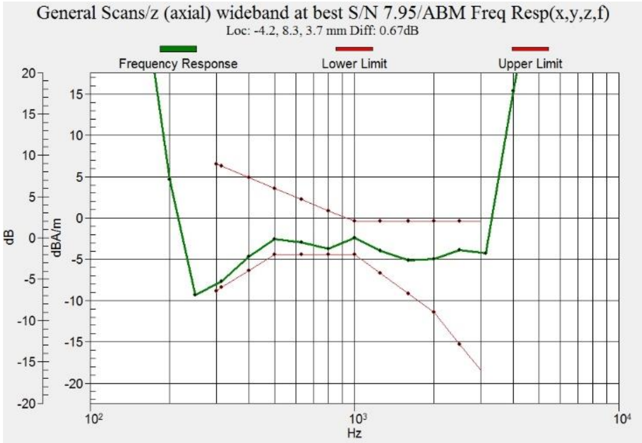


Figure C.4 Frequency Response of WCDMA 1900

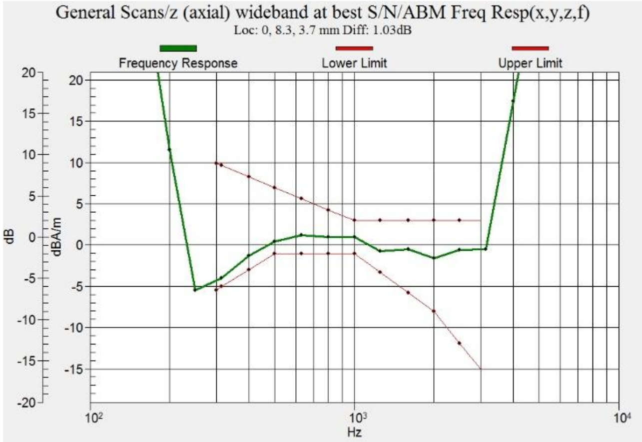


Figure C.5 Frequency Response of WCDMA 1700

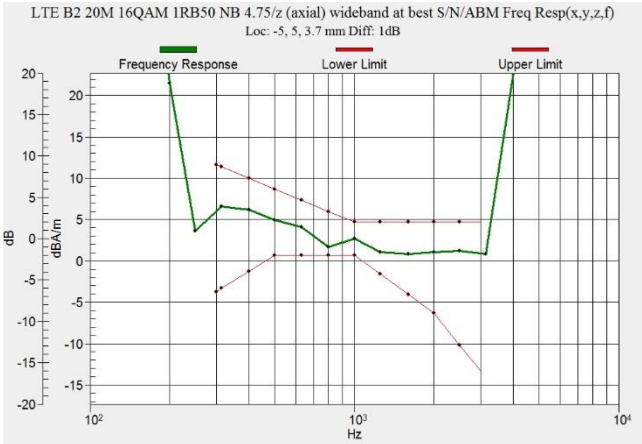


Figure C.6 Frequency Response of LTE B2

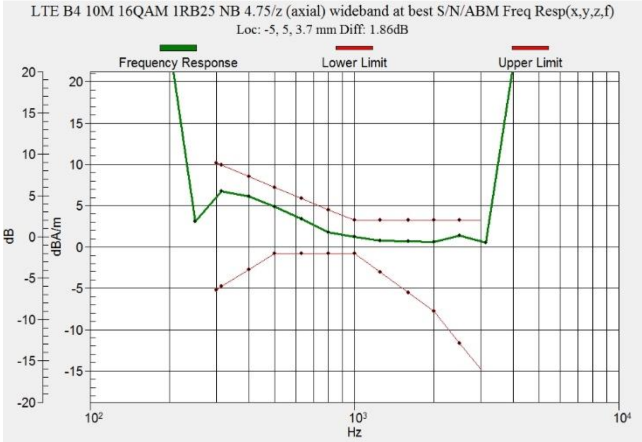


Figure C.7 Frequency Response of LTE B4

Figure C.8 Frequency Response of LTE B5

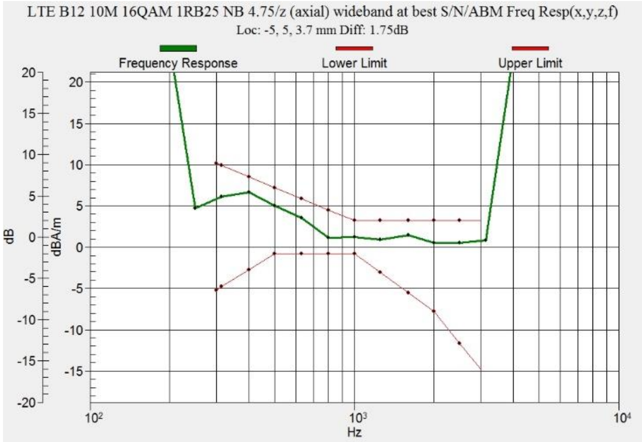


Figure C.9 Frequency Response of LTE B12

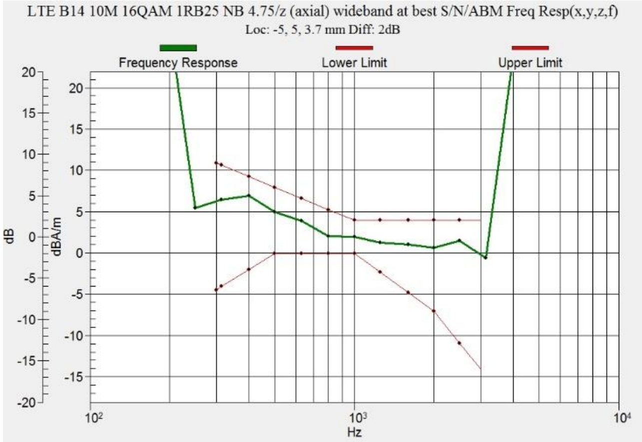


Figure C.10 Frequency Response of LTE B14

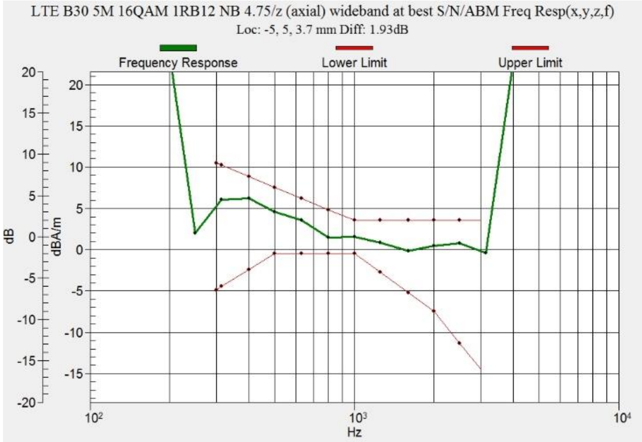


Figure C.11 Frequency Response of LTE B30

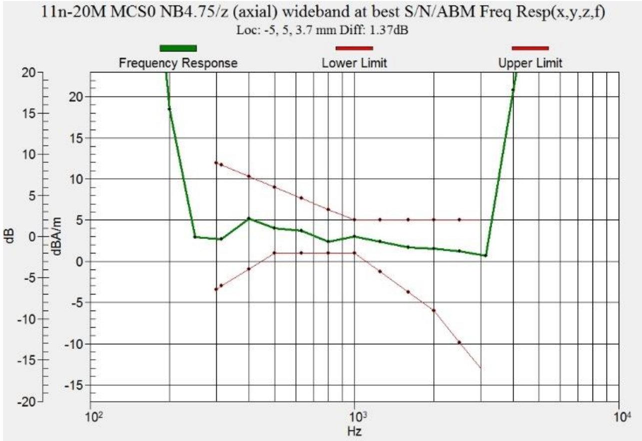


Figure C.12 Frequency Response of WiFi 2.4G