



HAC TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-Z6750M
Product 5G NR Multi-Mode Mobile Phone
Model Z6750M
Report No. R2008A0549-H2V3
Issue Date November 3, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **ANSI C63.19-2011**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Version	Revision description	Issue Date
Rev.0	/	October 26, 2020
Rev.1	Update description in chapter 9.	October 28, 2020
Rev.2	Update the Type about NR	October 30, 2020
Rev.3	Increase the description about Audio Level and Gain Measurements in chapter 10.	November 3, 2020

Note This revised report (Report No.: R2008A0549-H2V3) supersedes and replaces the previously issued report (Report No.: R2008A0549-H2V2). Please discard or destroy the previously issued report and dispose of it accordingly.

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd**). The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.2 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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1.3 Laboratory Environment

Temperature	Min. = 18°C, Max. = 28 °C
Relative humidity	Min. = 0%, Max. = 80%
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.	

2 Statement of Compliance

Table 2.1: T-Coil signal quality categories of each tested Mode

Band	Category
LTE Band 2	T4
LTE Band 4	T4
LTE Band 5	T4
LTE Band 12	T4
LTE Band 13	T4
LTE Band 66	T4
EN-DC_5A_n2	T4
EN-DC_2A_n5	T4
EN-DC_2A_n66	T4
WIFI2.4G 802.11b	T4
WIFI2.4G 802.11g	T4
WIFI2.4G 802.11n	T4
WIFI5G 802.11a (U-NII-1)	T4
WIFI5G 802.11a (U-NII-3)	T4
The Total T-Coil rating is T4	
Date of Testing: September 11, 2020 ~ September 12, 2020	
Date of Sample Received: August 17, 2020	
Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.	

3 Description of Equipment under Test

Client Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

General Technologies

Device Type:	Portable Device	
EUT Stage	Production Unit	
Model	Z6750M	
IMEI:	865633050021924	
Hardware Version	Z6750MHW1.0	
Software Version	Z6750MV1.0.0B01	
Antenna Type	Internal Antenna	
Power Class:	LTE FDD Band 2/4/5/12/13/66: 3 NR Band n2/n5/n66: 3	
Power Level	LTE FDD Band 2/4/5/12/13/66: max power NR Band n2/n5/n66: max power	
Test Modulation:	(LTE) QPSK, 16QAM; (NR) CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM; DFT-s OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	
Operating Frequency Range(s):	Mode	Tx (MHz)
	LTE FDD 2	1850 ~ 1910
	LTE FDD 4	1710 ~ 1755
	LTE FDD 5	824 ~ 849
	LTE FDD 12	699 ~ 716
	LTE FDD 13	777 ~ 787
	LTE FDD 66	1710 ~ 1780
	NR Band n2	1850 ~ 1910
	NR Band n5	824 ~ 849
	NR Band n66	1710 ~ 1780
	Wi-Fi 2.4G	2412 ~ 2462
	Wi-Fi 5G U-NII-1	5150 ~ 5250
	Wi-Fi 5G U-NII-3	5725 ~ 5850
BT	2402 ~ 2480	
Accessory Equipment		
Battery	Manufacturer: COSMX Model: Li3939T44P8h756547	



Adapter 1	Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD Model: STC-A5930A1-Z
Adapter 2	Manufacturer: Jiangsu Chenyang Electron Co., Ltd. Model: STC-A5930A1-Z
USB Cable 1	Manufacturer: kingpower-tech Model: USB-TC30-W-100-M
USB Cable 2	Manufacturer: Luxshare Precision industry Co., Ltd. Model: USB-TC30-W-100-M
Note: The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.	



Air-Interface	Band (MHz)	Type Transport	ANSI C63.19 tested	Simultaneous Transmissions	Name of Voice Service	Power Reduction
LTE	1900 (B2)	VD	Yes	Yes BT or Wi-Fi	VoLTE Google Duo	No
	1700 (B4)					
	850 (B5)					
	700 (B12)					
	780 (B13)					
	1700 (B66)					
5G NR ENDC	1900 (n2)	VD	Yes	Yes BT or Wi-Fi	Google Duo	No
	850 (n5)					
	1700 (n66)					
Wi-Fi	2450	VD	Yes	Yes LTE, NR	VoWiFi Google Duo	No
	5200 (U-NII-1)					
	5800 (U-NII-3)					
Bluetooth (BT)	2450	DT	No	Yes LTE, NR	N/A	No

VO= legacy Cellular Voice Service from Table 7.1 in 7.4.2.1 of ANSI C63.19-2011

VD= IP voice service over digital transport.

DT= Digital Transport only (no voice)

Notes:

1. Reference level in accordance with 7.4.2.1 of ANSI C63.19-2011 and July 2012 C63 VoLTE Interpretation.
2. Reference level is -20dBm0 in accordance with FCC KDB 285076 D02.
3. NR was evaluated using an interim procedure outlined in Section 7.II.5.



4 Test Specification and Operational Conditions

4.1 Test Specification

The tests documented in this report were performed in accordance with the following:

FCC CFR47 Part 20.19

ANSI C63.19-2011

KDB 285076 D01 HAC Guidance v05

KDB 285076 D02 T-Coil Testing v03

KDB 285076 D03 HAC FAQ v01r03

5 Test Information

5.1 Operational Conditions during Test

5.1.1 General Description of Test Procedures

The phone was tested in all normal configurations for the ear use. The EUT is mounted in the device holder equivalent as for classic dosimeter measurements. The acoustic output of the EUT shall coincide with the center point of the area formed by the dielectric wire and the middle bar of the arch's top frame. The EUT shall be moved vertically upwards until it touches the frame. The fine adjustment is possible by sliding the complete EUT holder on the yellow base plate of the Test Arch phantom. During the test, the EUT is selected on T-Coil mode, the LCD backlight is turned off and volume is adjusted to maximum level.

A communication link is set up with a System Simulator (SS) by RF cable, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to Ch Middle respectively in the case of Band. T-Coil configurations is measured using System Simulator (SS) of CMU200/ CMW 500, at the same time the EUT shall be operated at its maximum RF output power setting.

5.2 T-Coil Measurements System Configuration

5.2.1 T-coil Measurement Set-up

These measurements are performed using the DASY5 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 Core computer, near-field probe, probe alignment sensor. The robot is a six-axis industrial robot performing precise movements. Cell controller systems contain the power supply, robot controller, teach pendant (Joystick) and remote control, and are used to drive the robot motors. 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.

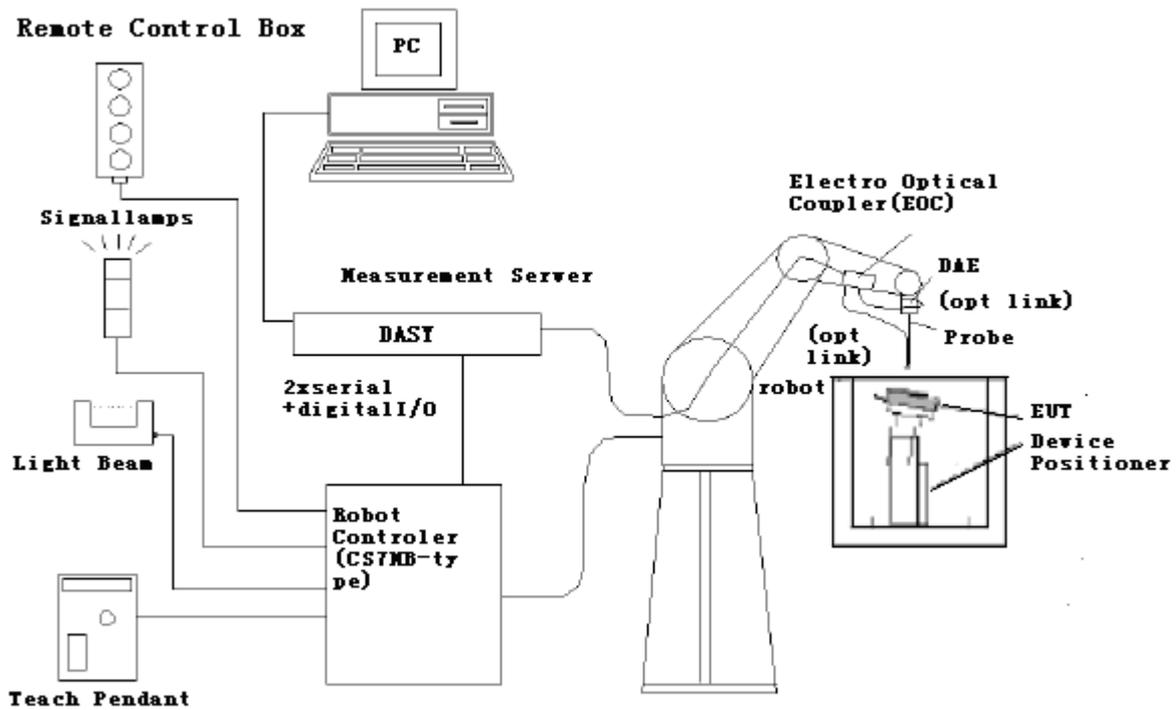


Figure 1 T-Coil Test Measurement Set-up

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.

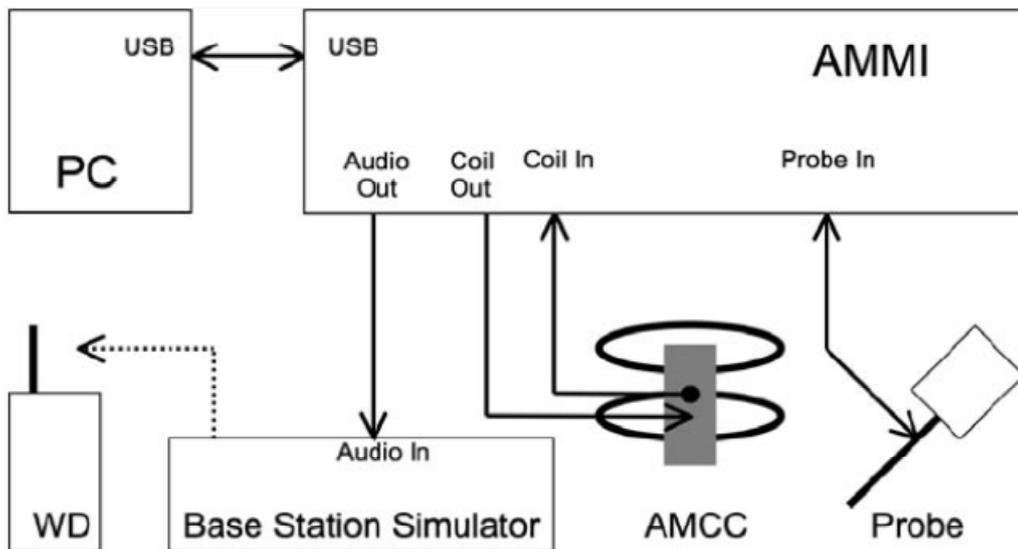


Figure 2 T-Coil Test Measurement Set-up

5.2.2 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 - 20 kHz (RF sensitivity <-100 dB, fully RF shielded)
sensitivity	<-50 dB A/m @ 1 kHz
pre-amplifier	40 dB, symmetric
dimensions	tip diameter / length: 6 / 290 mm, sensor according to ANSI-C63.19



Figure 3 AM1D Probe

5.2.3 Audio Magnetic Measurement Instrument (AMMI)

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.



Figure 4 AMMI front panel

Port description:

Audio Out	BNC, audio signal to the base station simulator, for >500Ohm load
Coil Out	BNC, test and calibration signal to the AMCC (top connector), for 50Ohm load
Coil In	XLR, monitor signal from the AMCC BNO connector, 600 Ohm
Probe In	XLR, probe signal and phantom supply to the probe Lemo connector



Figure 5 AMMI rear side

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

5.2.4 Helmholtz Calibration Coil (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 100hm permits monitoring the current with a scale of 1:10

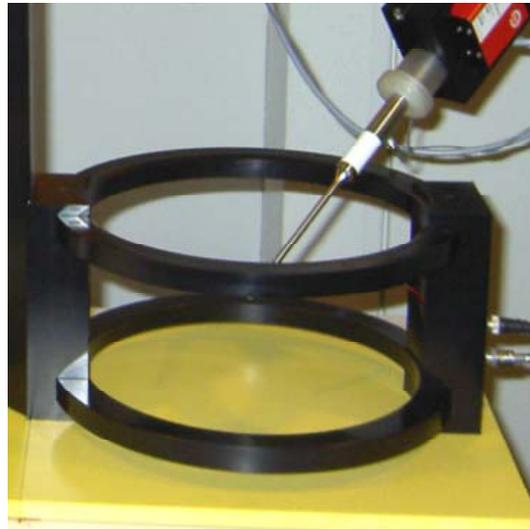


Figure 6 AMCC

Port description:

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

Specification:

Dimensions	370 x 370 x 196 mm, according to ANSI-C63.19
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5.2.5 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 Device reference point is set for the EUT at 6.3 mm, the Grid reference point is on the upper surface at the origin of the coordinates, and the “user point \Height Check 0.5 mm” is 0.5mm above the center, allowing verication of the gap of 0.5mm while the probe is positioned there.

The Phone Positioner supports accurate and reliable positioning of any phone with effect on near field $\leq \pm 0.5 \text{ dB}$.



Figure 7 T-coil Phantom & Device Holder

5.3 T-Coil measurement points and reference plane

The following figure illustrates the standard probe orientations. Position 1 is the perpendicular orientation of the probe coil; orientation 2 is the transverse orientation. The space between the measurement positions is not fixed. It is recommended that a scan of the WD be performed 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 EUT 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 EUT and shall be located in the same half of the phone as the EUT receiver. In a EUT 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.
- 7) The actual location of the measurement point shall be noted in test reports and designated as the measurement reference point.

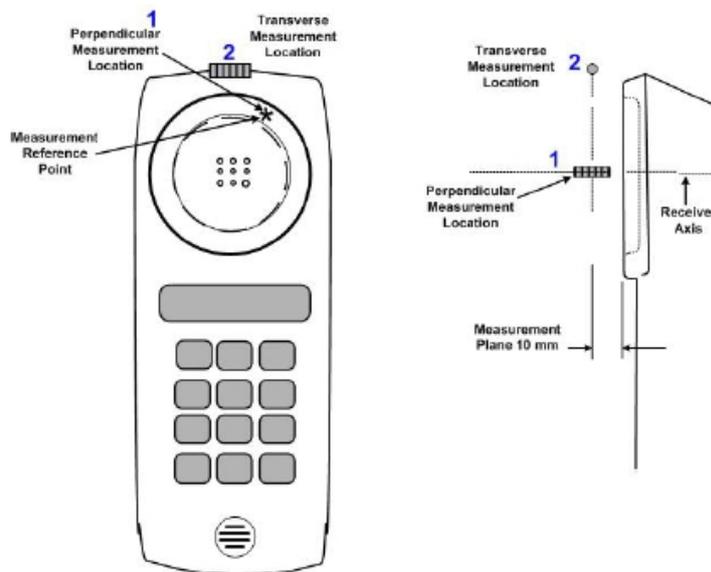


Figure 8 Axis and planes for EUT audio frequency magnetic field measurements

5.4 T-Coil Test Procedures

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 of C63.19 per 8.3.2.
- 4) The EUT was positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.
- 5) The EUT 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 EUT audio output was positioned tangent (as physically possible) to the measurement plane.
- 6) The EUT'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 EUT 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 axial,radial transverse and radial longitudinal orientation, and the frequency response was measured in axial axis.

10) Corrected for the frequency response after the EUT 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.

6 T-Coil Performance Requirements

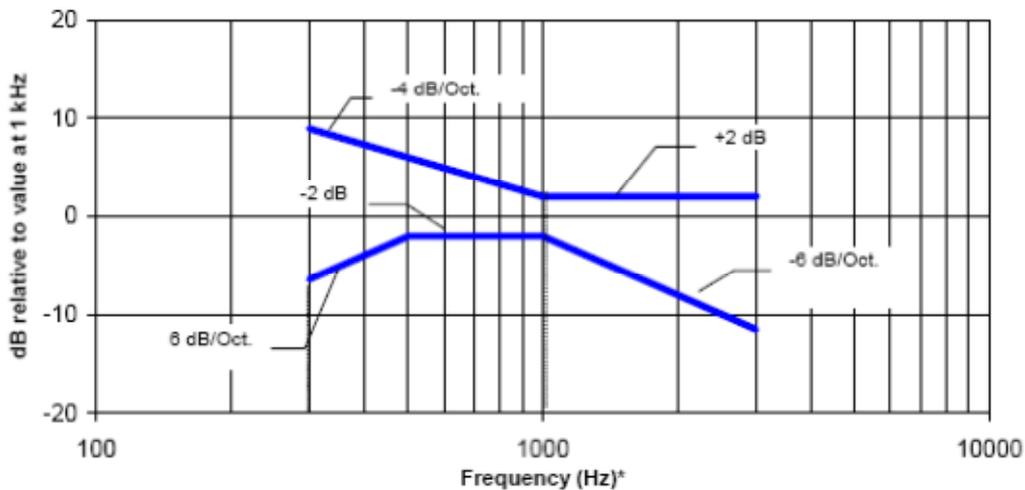
In order to be rated for T-Coil use, a EUT shall meet the requirements for signal level and signal quality contained in this part.

6.1 T-Coil coupling field intensity

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

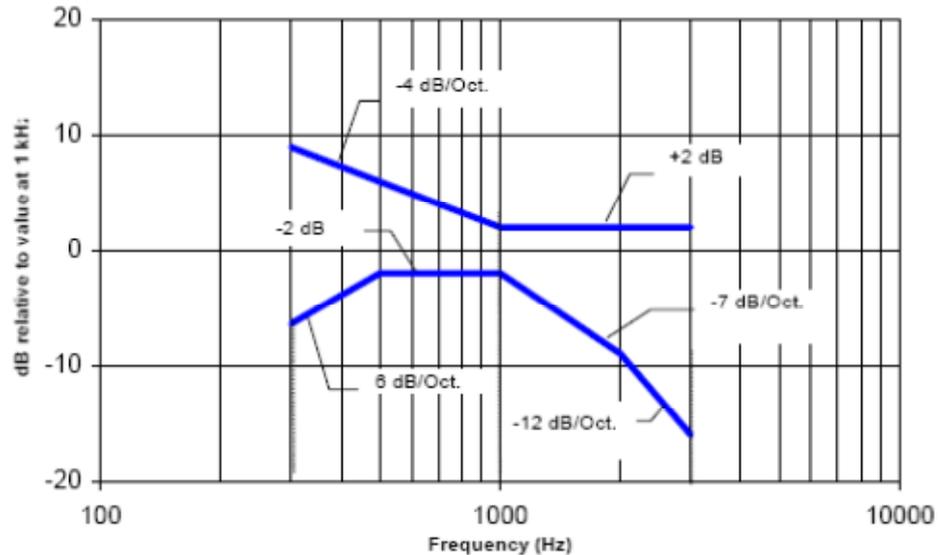
6.2 Frequency response

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. The following figures 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 9 Magnetic field frequency response for EUTs with a field ≤ -15 dB (A/m) at 1 kHz



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

Figure 10 Magnetic field frequency response for EUTs with a field that exceeds -15 dB(A/m) at 1 kHz

6.3 Signal quality

This part provides the signal quality requirement for the intended T-Coil signal from a EUT. Only the RF immunity of the hearing aid is measured in T-Coil mode. It is assumed that a hearing aid can have no immunity to an interference signal in the audio band, which is the intended reception band for this mode. So, the only criteria that can be measured is the RF immunity in T-Coil mode. This is measured using the same procedure as for the audio coupling mode and at the same levels.

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

Table 1: T-Coil signal quality categories

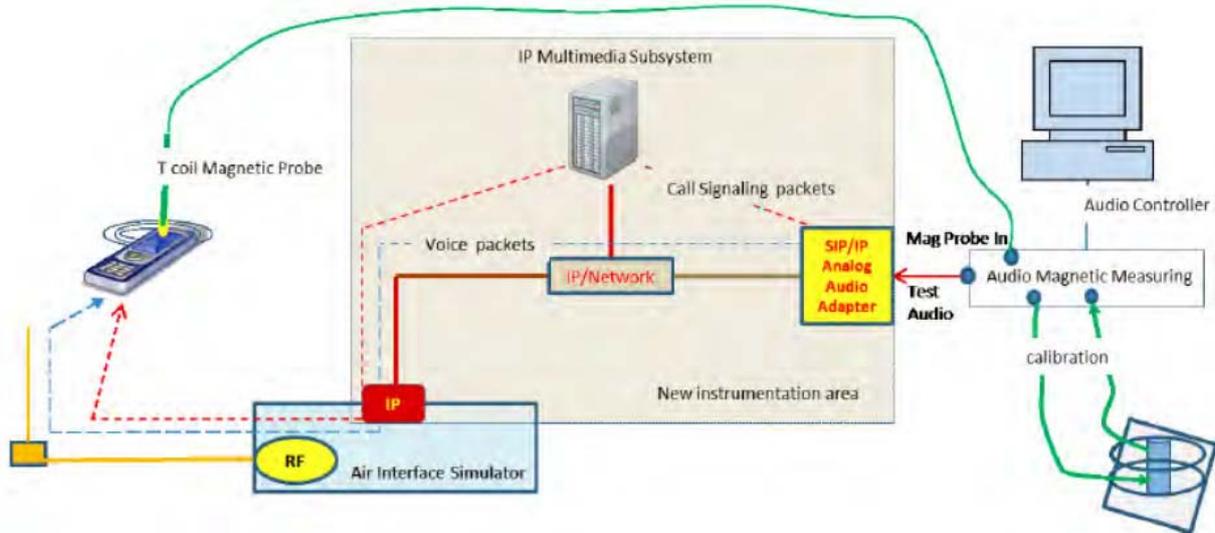
Category	Telephone parameters WD signal quality [(signal + noise) – to – noise ratio in decibels]
Category T1	0 dB to 10 dB
Category T2	10 dB to 20 dB
Category T3	20 dB to 30 dB
Category T4	> 30 dB

7 T-Coil testing for VoLTE

I. Test setup for VoLTE over IMS T-coil Testing

1. Test setup

The general test setup used for VoLTE over IMS is shown below. The call box used when performing VoLTE over IMS T-coil measurement is a CMW500. The Data Application Unit (DAU) of the CMW500 was used to simulate the IP Multimedia Subsystem (IMS) server.



2. Audio level setting

According to the July 2012 interpretations by the C63 Committee regarding the appropriate audio levels to be used for VoLTE over IMS T-coil testing, -16dBm0 shall be used for the normal speech input level. The CMW500 base station simulator was manually configured to ensure that the settings for speech input and full scale levels resulted in the -16dBm0 speech input level to the DUT for the VoLTE over IMS connection.

II. DUT configuration for VoLTE over IMS T-coil Testing

1. Radio configuration investigation

An investigation was performed to determine the modulation and RB configuration to be used for testing. QPSK, 1RB, 0RB offset was used for the testing as the worst-case configuration.

Radio Configuration Investigation

VOLTE over IMS SNNR by Radio Configuration								
Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
1880	18900	20	QPSK	1	0	4.02	-48.85	52.87
1880	18900	20	QPSK	1	50	4.16	-48.95	53.11
1880	18900	20	QPSK	1	99	4.2	-49.03	53.23
1880	18900	20	QPSK	50	0	3.98	-49.22	53.2



1880	18900	20	QPSK	50	25	4.11	-49.3	53.41
1880	18900	20	QPSK	50	50	4.09	-48.98	53.07
1880	18900	20	QPSK	100	0	3.86	-49.29	53.15
1880	18900	20	16QAM	1	0	3.92	-49.06	52.98
1880	18900	20	16QAM	1	50	3.88	-49.22	53.1
1880	18900	20	16QAM	1	99	4.06	-49.32	53.38
1880	18900	20	16QAM	50	0	4.13	-49.3	53.43
1880	18900	20	16QAM	50	25	3.97	-49.32	53.29
1880	18900	20	16QAM	50	50	3.77	-49.4	53.17
1880	18900	20	16QAM	100	0	4.12	-49.46	53.58

2.Codec investigation

An investigation was performed to determine the audio codec to be used for testing. The WB AMR 6.60kbps setting was used for the audio codec on the CMW500 for VoLTE over IMS T-coil testing.

AMR Codec Investigation - VoLTE over IMS							
Codec Setting	WB AMR 23.85kbps	WB AMR 6.60 kbps	NB AMR 12.2 kbps	NB AMR 4.75 kbps	Orientation	Band /BW	Channel
ABM1 (dBA/m)	-1.37	0.64	4.05	4.17	z (Axial):	Band2/ 20MHz	18900
ABM2 (dBA/m)	-49.04	-48.68	-48.44	-49.09			
Frequency Response	pass	pass	pass	pass			
Signal Quality (dB)	47.67	49.32	52.49	53.26			

EVS Codec Investigation - VoLTE over IMS							
Codec Setting	WB AMR 23.85kbps	WB AMR 6.60 kbps	NB AMR 12.2 kbps	NB AMR 4.75 kbps	Orientation	Band /BW	Channel
ABM1 (dBA/m)	-1.42	-0.72	3.66	3.81	z (Axial):	Band2/ 20MHz	18900
ABM2 (dBA/m)	-50.28	-49.9	-47.63	-47.95			
Frequency Response	pass	pass	pass	pass			
Signal Quality (dB)	48.86	49.18	51.29	51.76			

3.Air Interface Investigation

The worst case band for each probe orientation is additionally tested on all bandwidth combination. LTE B2 at 20MHz is the worst case for the Axial and Radial probe orientation.

8 T-Coil testing for VoWIFI

I. Test setup for VoWIFI over IMS T-coil Testing

1. Test setup

The general test setup used for VoWIFI over IMS, or CMRS WIFI calling, is shown below. The call box used when performing VoWIFI over IMS T-coil measurement is a CMW500. The Data Application Unit (DAU) of the CMW500 was used to simulate the IP Multimedia Subsystem (IMS) server.

2. Audio level setting

According to the KDB285076 D02, regarding the appropriate audio levels to be used for WIFI over IMS T-coil testing, -20dBm0 shall be used for the normal speech input level. The CMW500 base station simulator was manually configured to ensure that the settings for speech input and full scale levels resulted in the -20dBm0 speech input level to the DUT for the VoWIFI over IMS connection.

II. DUT configuration for VoWIFI over IMS T-coil Testing

1. Radio configuration investigation

Investigate the lowest and highest data rates and modulation to determine worst radio configuration to be used for testing by SNR comparison.

802.11b Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11b	6	1	1.19	-37.02	38.21
802.11b	6	11	1.63	-39.16	40.79
802.11g Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11g	6	6	0.86	-43.33	44.19
802.11g	6	54	1.23	-43.96	45.19
802.11n HT20 Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11n HT20	6	MCS0	-1.21	-47.03	45.82
802.11n HT20	6	MCS7	-1.03	-47.65	46.62
802.11n HT40 Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11n HT40	6	MCS0	-1.28	-46.68	45.4
802.11n HT40	6	MCS7	-0.98	-47.25	46.27



802.11a Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11a	36	6	-5.13	-46.11	40.98
802.11a	36	54	-4.01	-46.85	42.84
802.11n HT20 Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11n HT20	36	MCS0	-2.33	-47.91	45.58
802.11n HT20	36	MCS7	-1.67	-47.72	46.05
802.11n HT40 Radio configuration investigation					
Mode	Channel	Data Rate [Mbps]	ABM1 [dB(A/m)]	ABM2 [dB(A/m)]	Signal Quality [dB]
802.11n HT40	38	MCS0	-2.13	-47.66	45.53
802.11n HT40	38	MCS7	-1.89	-47.39	45.5

2. Codec investigation

For a voice service/air interface, investigate the variations of codec configurations (WB, NB bit rate) and document the parameters (ABM1, ABM2, S+N/N, frequency response) for that voice service. It is only necessary to document this for one channel/band; the following worst investigation codec would be remarked to be used for the testing for the handset.

AMR Codec Investigation - VoWiFi over IMS								
Codec Setting	WB AMR 23.85kbps	WB AMR 6.60 kbps	NB AMR 12.2 kbps	NB AMR 4.75 kbps	Orientation	Band	Standard	Channel
ABM1 (dBA/m)	4.31	4.68	1.19	1.83	z (Axial):	2.4GHz	802.11b	6
ABM2 (dBA/m)	-35.5	-36.72	-37.02	-38.24				
Frequency Response	PASS	PASS	PASS	PASS				
Signal Quality (dB)	39.81	41.4	38.21	40.07				

EVS Codec Investigation - VoWiFi over IMS								
Codec Setting	WB AMR 23.85kbps	WB AMR 6.60 kbps	NB AMR 12.2 kbps	NB AMR 4.75 kbps	Orientation	Band	Standard	Channel
ABM1 (dBA/m)	4.16	4.55	1.72	2.09	z (Axial):	2.4GHz	802.11b	6
ABM2 (dBA/m)	-35.81	-36.29	-37.85	-38.66				
Frequency Response	PASS	PASS	PASS	PASS				
Signal Quality (dB)	39.97	40.84	39.57	40.75				

3. Air Interface Investigation

a. Use the worst-case codec test and document a limited set of bands/channel/bandwidths. Observe the effect of changing the band and bandwidth to ensure that there are no unexpected variations. Using the knowledge of the observed variations, it is necessary to report only a set band/channel/bandwidth for each orientation for a voice service/air interface and the following worst configure would be remarked to be used for the testing for the handset.

b. Select WLAN 2.4GHz and WLAN 5GHz one frequency band to do measurement at the worst SNR position was additionally performed with varying the BWs/Modulations/data rate to verify the variation to find out worst configuration , the observed variation is very little to be within 1.5 dB which is much less than the margin from the rating threshold.

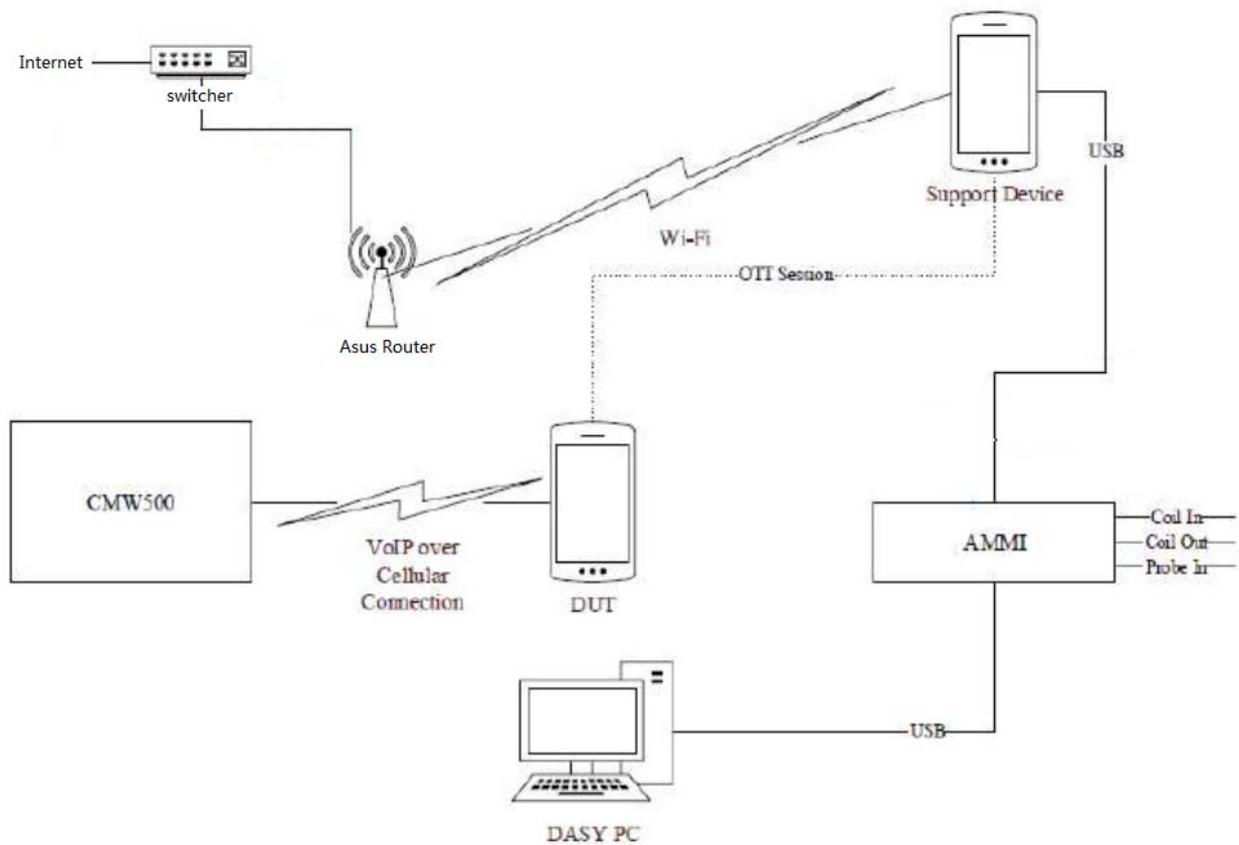
c. According to the ANSI C63.19 2011 section 7.3.2, test middle channel of each frequency band for HAC testing for each orientation to determine worst HAC T-Coil rating.

9 T-Coil testing for OTT

This device supports VoIP via a preinstalled application that uses the Google Duo service, using OPUS as its only codec. VoIP capabilities require HAC assessment when voice calls are supported over the cellular data connection via preinstalled VoIP applications and the assessment is subject to Pre-Approval Guidance procedures.

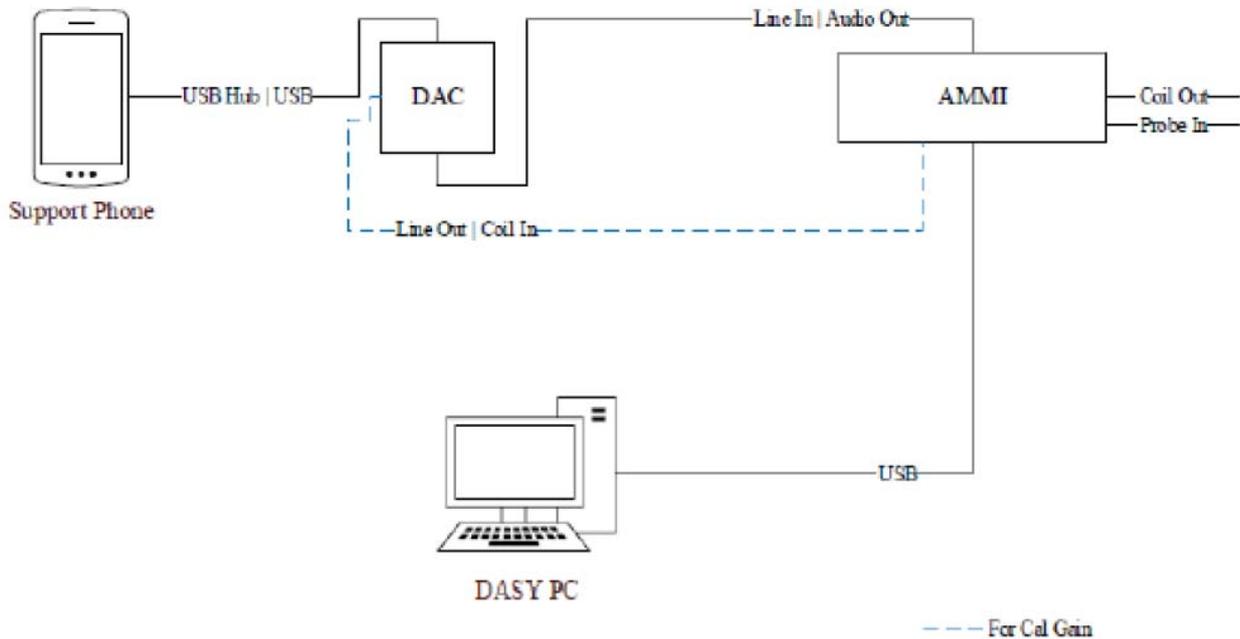
The equipment is set up as shown below with a support device used to originate the call using the IP transport. The support device connects to the cloud-based Google Duo service via Wi-Fi access point and router, or RJ45. The DUT connects to the VoIP service via a cellular/unlicensed air interface to the call box and an Ethernet connection from call box to Internet. The various codec bit rate and air interface configurations are evaluated to determine the worst-case configuration

Test Setup configuration for OTT calls



For the OTT call, the calibrated audio card within the CMW500 cannot be used so the AMMI is connected to an external Digital-Analog Converter (DAC) and the DAC is connected to the Support Device via USB. The test signal is sent from the DASY PC to the AMMI, from the AMMI to the DAC, from the DAC to the Support Device, and, via the VoIP call, to the DUT.

As this test set up uses an external DAC between the AMMI's audio output and support device, the appropriate gain factor for the OTT call needs be determined. This is done by connecting the DAC between the AMMI Audio output and Coil input as shown below.



Using the metering function on the DAC, the DAC gain is adjusted until the volume reaches 0 dBFS (3.14 dBm0 based on TIA/EIA 810-A). SPEAG's "TN-LK-05042018-C-T-Coil_Levels" document (ANNEX E) steps E through H are then followed to determine the adjusted gain values so that the reference level is set to 23.14dB below full scale, i.e. at -20dBm0. A verification of the DAC's output is performed prior to testing.



Codec Investigation - OTT VoIP(LTE)					
Codec Setting	75kbps	6kbps	Orientation	Band	Channel
ABM1 (dBA/m)	5.31	5.79	z (Axial):	LTE Band 2	18900
ABM2 (dBA/m)	53.99	50.47			
Frequency Response	PASS	PASS			
Signal Quality (dB)	-48.68	-44.68			

Codec Investigation - OTT VoIP(WIFI)						
Codec Setting	75kbps	6kbps	Orientation	Band	Standard	Channel
ABM1 (dBA/m)	6.52	5.28	z (Axial):	2.4GHz	802.11b	6
ABM2 (dBA/m)	38.84	37.66				
Frequency Response	PASS	PASS				
Signal Quality (dB)	-32.32	-32.38				

10 Audio Level and Gain Measurements

10.1 VOLTE

Signal Type	Audio Level [dBm0]	Gain [dB]	Gain [linear]
Voice 1 kHz	-16	27.86	24.72
Voice 300 - 3 kHz	-16	34.10	50.70

10.2 VOWi-Fi

Signal Type	Audio Level [dBm0]	Gain [dB]	Gain [linear]
Voice 1 kHz	-20	23.71	15.33
Voice 300 - 3 kHz	-20	31.85	39.13

10.3 Over the Top(OTT)

For LTE and Wi-Fi the linear gain levels listed below were used. The results below are based on a reference input level of -20 dBm0.

To calibrate the DAC, three. Way audio files (sine wave, 1 kHz voice, and 300 to 3 kHz voice) are sent from the DASY5 PC to the AMMI, then to the DAC. The Helmholtz resonator measures the field strength, which represents the AMMI to DAC input sensitivity. After determining the input sensitivity, the adjusted linear gain values can then be calculated.

Signal Type	Audio Level [dBm0]	Gain [dB]	Gain [linear]
Voice 1 kHz	-20	29.27	29.07
Voice 300 - 3 kHz	-20	37.14	71.94



11 Summary Test Results

Air interface investigation for LTE B2										
Mode	Orientation	Bandwidth (MHz)	Channel	ABM1 [dB (A/m)]	ABM2 [dB (A/m)]	Ambient Noise [dB (A/m)]	Frequency Response Variation (dB)	Signal Quality (dB)	C63.19-201 1 Rating	Plot No.
LTE Band 2	z (Axial):	20	18900	4.02	-48.85	-58.49	1.62	52.87	T4	12
		15	18900	4.26	-48.92	-58.49	1.58	53.18	T4	-
		10	18900	4.83	-48.49	-58.49	1.71	53.32	T4	-
		5	18900	5.11	-48.33	-58.49	1.43	53.44	T4	-
		3	18900	5.37	-48.44	-58.49	1.56	53.81	T4	-
		1.4	18900	5.22	-48.43	-58.49	1.67	53.65	T4	-
	y (Radial):	20	18900	0.01	-42.48	-58.73	/	42.49	T4	11
		15	18900	0.37	-43.26	-58.73	/	43.63	T4	-
		10	18900	0.76	-43.41	-58.73	/	44.17	T4	-
		5	18900	1.09	-43.59	-58.73	/	44.68	T4	-
		3	18900	1.23	-44.06	-58.73	/	45.29	T4	-
		1.4	18900	1.58	-43.95	-58.73	/	45.53	T4	-

Result For LTE & Wi-Fi (NB)

Band	Channel /Frequency (MHz)	Probe Orientation	ABM1 [dB (A/m)]	ABM2 [dB (A/m)]	Ambient Noise [dB (A/m)]	ABM SNR (dB)	Freq. Resp. Diff(dB)	Frequency Response	T-Rating	Plot No.
LTE FDD B2 Voice NB AMR Codec: 12.20kbit/s	18900/1880 (QPSK_20M_1RB_0offset)	y (Radial):	0.01	-42.48	-58.49	42.49	/	/	T4	1
		z (Axial):	4.02	-48.85	-58.97	52.87	1.62	Pass	T4	2
LTE FDD B4 Voice NB AMR Codec: 12.20kbit/s	20175/1732.5 (QPSK_20M_1RB_0offset)	y (Radial):	0.92	-42.10	-58.49	43.02	/	/	T4	3
		z (Axial):	2.71	-49.95	-58.97	52.66	1.94	Pass	T4	4
LTE FDD B5 Voice NB AMR Codec: 12.20kbit/s	20525/836.5 (QPSK_10M_1RB_0offset)	y (Radial):	1.03	-43.70	-58.49	44.73	/	/	T4	5
		z (Axial):	2.81	-50.83	-58.97	53.64	1.73	Pass	T4	6
LTE FDD B12 Voice NB AMR Codec: 12.20kbit/s	23095/707.5 (QPSK_10M_1RB_0offset)	y (Radial):	-6.87	-47.71	-58.49	40.84	/	/	T4	7
		z (Axial):	0.91	-50.64	-58.97	51.55	2.00	Pass	T4	8
LTE FDD B13 Voice NB AMR Codec: 12.20kbit/s	23230/782 (QPSK_10M_1RB_0offset)	y (Radial):	-1.28	-42.80	-58.49	41.52	/	/	T4	9
		z (Axial):	0.95	-50.26	-58.97	51.21	1.99	Pass	T4	10
LTE FDD B66 Voice NB AMR Codec: 12.20kbit/s	132322/1745 (QPSK_20M_1RB_0offset)	y (Radial):	-1.23	-41.71	-58.49	40.48	/	/	T4	11
		z (Axial):	0.93	-50.09	-58.97	51.02	1.98	Pass	T4	12



WIFI2.4G: 802.11b Voice NB AMR Codec: 12.20kbit/s	6/2437 (BW:20M_Rate:11M)	y (Radial):	-1.96	-43.31	-58.49	41.35	/	/	T4	13
		z (Axial):	1.19	-37.02	-58.97	38.21	0.80	Pass	T4	14
WIFI2.4G: 802.11g Voice NB AMR Codec: 12.20kbit/s	6/2437 (BW:20M_Rate:6M)	y (Radial):	2.26	-41.28	-58.49	43.54	/	/	T4	15
		z (Axial):	0.86	-43.33	-58.97	44.19	0.94	Pass	T4	16
WIFI2.4G: 802.11n Voice NB AMR Codec: 12.20kbit/s	6/2437 (BW:20M_Rate:MCS0)	y (Radial):	-5.13	-48.63	-58.49	43.50	/	/	T4	17
		z (Axial):	-1.21	-47.03	-58.97	45.82	2.00	Pass	T4	18
WIFI5G: 802.11a (U-NII-1) Voice NB AMR Codec: 12.20kbit/s	44/5220 (BW:20M_Rate:6M)	y (Radial):	-5.13	-48.43	-58.49	40.98	/	/	T4	19
		z (Axial):	-1.88	-46.11	-58.97	46.55	1.35	Pass	T4	20
WIFI5G: 802.11a (U-NII-3) Voice NB AMR Codec: 12.20kbit/s	157/5785 (BW:20M_Rate:6M)	y (Radial):	-1.13	-42.63	-58.49	41.50	/	/	T4	21
		z (Axial):	1.40	-46.90	-58.97	48.30	1.80	Pass	T4	22

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

Result For LTE & Wi-Fi (WB)

Band	Channel /Frequency (MHz)	Probe Orientation	ABM1 [dB (A/m)]	ABM2 [dB (A/m)]	Ambient Noise [dB (A/m)]	ABM SNR (dB)	Freq. Resp. Diff(dB)	Frequency Response	T-Rating	Plot No.
LTE FDD B2 Voice WB AMR Codec: 23.85kbit/s	18900/1880 (QPSK_20M_1RB_0offset)	y (Radial):	-2.84	-42.01	-58.49	39.17	/	/	T4	23
		z (Axial):	-1.37	-49.04	-58.97	47.67	1.89	Pass	T4	24
LTE FDD B4 Voice WB AMR Codec: 23.85kbit/s	20175/1732.5 (QPSK_20M_1RB_0offset)	y (Radial):	-2.83	-42.18	-58.49	39.35	/	/	T4	25
		z (Axial):	-0.95	-50.13	-58.97	49.18	1.73	Pass	T4	26
LTE FDD B5 Voice WB AMR Codec: 23.85kbit/s	20525/836.5 (QPSK_10M_1RB_0offset)	y (Radial):	-1.10	-41.91	-58.49	40.81	/	/	T4	27
		z (Axial):	1.48	-50.74	-58.97	52.22	2.00	Pass	T4	28
LTE FDD B12 Voice WB AMR Codec: 23.85kbit/s	23095/707.5 (QPSK_10M_1RB_0offset)	y (Radial):	-1.47	-41.77	-58.49	40.30	/	/	T4	29
		z (Axial):	1.12	-50.61	-58.97	51.73	1.99	Pass	T4	30
LTE FDD B13 Voice WB AMR Codec: 23.85kbit/s	23230/782 (QPSK_10M_1RB_0offset)	y (Radial):	-1.64	-42.71	-58.49	41.07	/	/	T4	31
		z (Axial):	0.52	-50.17	-58.97	50.69	1.95	Pass	T4	32
LTE FDD B66 Voice NB AMR Codec: 12.20kbit/s	132322/1745 (QPSK_20M_1RB_0offset)	y (Radial):	-1.60	-41.23	-58.49	39.63	/	/	T4	33
		z (Axial):	0.65	-50.06	-58.97	50.71	1.96	Pass	T4	34



WIFI2.4G: 802.11b Voice WB AMR Codec: 23.85kbit/s	6/2437 (BW:20M_Rate:11M)	y (Radial):	2.87	-48.19	-58.49	51.06	/	/	T4	35
		z (Axial):	4.31	-35.50	-58.97	39.81	1.19	Pass	T4	36
WIFI2.4G: 802.11g Voice WB AMR Codec: 23.85kbit/s	6/2437 (BW:20M_Rate:6M)	y (Radial):	0.15	-44.66	-58.49	44.81	/	/	T4	37
		z (Axial):	7.40	-36.67	-58.97	44.07	1.64	Pass	T4	38
WIFI2.4G: 802.11n Voice WB AMR Codec: 23.85kbit/s	6/2437 (BW:20M_Rate:MCS0)	y (Radial):	-0.67	-46.83	-58.49	46.16	/	/	T4	39
		z (Axial):	2.58	-46.99	-58.97	49.57	1.70	Pass	T4	40
WIFI5G: 802.11a (U-NII-1) Voice WB AMR Codec: 23.85kbit/s	44/5220 (BW:20M_Rate:6M)	y (Radial):	-1.72	-46.90	-58.49	45.18	/	/	T4	41
		z (Axial):	3.28	-47.42	-58.97	50.70	1.64	Pass	T4	42
WIFI5G: 802.11a (U-NII-3) Voice WB AMR Codec: 23.85kbit/s	157/5785 (BW:20M_Rate:6M)	y (Radial):	0.83	-42.76	-58.49	43.59	/	/	T4	43
		z (Axial):	3.46	-46.92	-58.97	50.38	1.72	Pass	T4	44

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

Result For LTE & Wi-Fi (OTT VoIP)

Band	Channel /Frequency (MHz)	Probe Orientation	ABM1 [dB (A/m)]	ABM2 [dB (A/m)]	Ambient Noise [dB (A/m)]	ABM SNR (dB)	Freq. Resp. Diff(dB)	Frequency Response	T-Rating	Plot No.
LTE FDD B2 Google Duo 6kbps	18900/1880 (QPSK_20M_Full RB_0offset)	y (Radial):	-3.46	-47.22	-58.49	43.76	/	/	T4	45
		z (Axial):	5.79	-44.68	-58.97	50.47	1.49	Pass	T4	46
LTE FDD B4 Google Duo 6kbps	20175/1732.5 (QPSK_20M_Full RB_0offset)	y (Radial):	1.14	-42.68	-58.49	43.82	/	/	T4	47
		z (Axial):	4.90	-50.27	-58.97	55.17	1.15	Pass	T4	48
LTE FDD B5 Google Duo 6kbps	20525/836.5 (QPSK_10M_Full RB_0offset)	y (Radial):	1.77	-43.11	-58.49	44.88	/	/	T4	49
		z (Axial):	4.76	-50.00	-58.97	54.76	1.21	Pass	T4	50
LTE FDD B12 Google Duo 6kbps	23095/707.5 (QPSK_10M_Full RB_0offset)	y (Radial):	1.87	-43.56	-58.49	45.43	/	/	T4	51
		z (Axial):	4.81	-50.43	-58.97	55.24	1.47	Pass	T4	52
LTE FDD B13 Google Duo 6kbps	23230/782 (QPSK_10M_Full RB_0offset)	y (Radial):	1.73	-42.29	-58.49	44.02	/	/	T4	53
		z (Axial):	4.65	-50.13	-58.97	54.78	1.90	Pass	T4	54
LTE FDD B66 Google Duo 6kbps	132322/1745 (QPSK_20M_Full RB_0offset)	y (Radial):	2.28	-41.90	-58.49	44.18	/	/	T4	55
		z (Axial):	8.36	-42.14	-58.97	50.50	0.80	Pass	T4	56



WIFI2.4G: 802.11b Google Duo 6kbps	6/2437 (BW:20M_Rate:11M)	y (Radial):	-0.53	-46.01	-58.49	45.48	/	/	T4	57
		z (Axial):	5.28	-32.38	-58.97	37.66	1.24	Pass	T4	58
WIFI2.4G: 802.11g Google Duo 6kbps	6/2437 (BW:20M_Rate:6M)	y (Radial):	1.18	-42.97	-58.49	44.15	/	/	T4	59
		z (Axial):	1.64	-50.61	-58.97	52.25	0.86	Pass	T4	60
WIFI2.4G: 802.11n Google Duo 6kbps	6/2437 (BW:200M_Rate:MCS0)	y (Radial):	2.03	-41.98	-58.49	44.01	/	/	T4	61
		z (Axial):	3.66	-48.68	-58.97	52.34	1.10	Pass	T4	62
WIFI5G: 802.11a (U-NII-1) Google Duo 6kbps	44/5220 (BW:20M_Rate:6M)	y (Radial):	1.67	-40.04	-58.49	41.71	/	/	T4	63
		z (Axial):	4.58	-46.04	-58.97	50.62	1.24	Pass	T4	64
WIFI5G: 802.11a (U-NII-3) Google Duo 6kbps	157/5785 (BW:20M_Rate:6M)	y (Radial):	-1.61	-41.58	-58.49	39.97	/	/	T4	65
		z (Axial):	7.84	-41.25	-58.97	49.09	1.42	Pass	T4	66

Note:

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

Result For EN-DC

An investigation was performed to determine the waveform, modulation, and RB configuration to be used for testing. Due to equipment limitations, the worst-case ABM1 from OTT VoIP was used with the ABM2 measured for each NR radio configuration. DFT-s OFDM QPSK_20M_Full RB_5KHz was determined to be the worst-case configuration for the handset and will be used for full testing.

Frequency Response measurements were not possible due to equipment limitations

Band	Channel /Frequency (MHz)	Probe Orientation	ABM1LTE (dB A/m)	ABM2LTE (dB A/m)	ABM2NR (dB A/m)	ABM SNR _{NR} (dB)	ABM SNR _{NR-3dB} (dB)	Freq. Resp. Diff (dB)	Frequency Response	T-Rating
EN-DC_5A_n2	376000/1880 (DFT-sOFDM QPSK_20M_Full RB_5KHz)	y (Radial):	1.03	-43.70	-52.32	53.35	50.35	/	/	T4
		z (Axial):	2.81	-50.83	-49.89	52.70	49.70	1.73	Pass	T4
EN-DC_2A_n5	349000/1745 (DFT-sOFDM QPSK_20M_Full RB_5KHz)	y (Radial):	0.01	-42.48	-51.95	51.96	48.96	/	/	T4
		z (Axial):	4.02	-48.85	-48.28	52.30	49.30	1.62	Pass	T4
EN-DC_2A_n66	349000/1745 (DFT-sOFDM QPSK_20M_Full RB_5KHz)	y (Radial):	0.01	-42.48	-51.15	51.16	48.16	/	/	T4
		z (Axial):	4.02	-48.85	-52.30	56.32	53.32	1.62	Pass	T4

Note: 1. The LCD backlight is turn off and volume is adjusted to maximum level during T-Coil testing.

2. Signal strength measurement scan plots are presented in Annex B.



12 Measurement Uncertainty

Measurement uncertainty evaluation template for DUT HAC T-Coil test

Error source	Type	Uncertainty Value a_i (%)	Prob. Dist.	k	ABM1 c_i	ABM2 c_i	Std. Unc. ABM1 (\pm %)	Std. Unc. ABM2 (\pm %)	Degree of freedom V_{eff} or v_i
Probe Sensitivity									
Reference Level	B	3.0	N	1	1	1	3.0	3.0	∞
AMCC Geometry	B	0.4	R	1.732	1	1	0.2	0.2	∞
AMCC Current	B	0.6	R	1.732	1	1	0.3	0.3	∞
Probe Positioning during Calibration	B	0.1	R	1.732	1	1	0.1	0.1	∞
Noise Contribution	B	0.7	R	1.732	0.0143	1	0.0	0.4	∞
Frequency Slope	B	5.9	R	1.732	0.1	1	0.3	3.4	∞
Probe System									
Repeatability / Drift	B	1.0	R	1.732	1	1	0.6	0.6	∞
Linearity / Dynamic Range	B	0.6	R	1.732	1	1	0.3	0.3	∞
Acoustic Noise	B	1.0	R	1.732	0.1	1	0.1	0.6	∞
Probe Angle	B	2.3	R	1.732	1	1	1.3	1.3	∞
Spectral Processing	B	0.9	R	1.732	1	1	0.5	0.5	∞
Integration Time	B	0.6	N	1	1	5	0.6	3.0	∞
Field Distribution	B	0.2	R	1.732	1	1	0.1	0.1	∞
Test Signal									
Ref. Signal Spectral Response	B	0.6	R	1.732	0	1	0.0	0.3	∞
Positioning									
Probe Positioning	B	1.9	R	1.732	1	1	1.1	1.1	∞
Phantom Thickness	B	0.9	R	1.732	1	1	0.5	0.5	∞
EUT Positioning	B	1.9	R	1.732	1	1	1.1	1.1	∞
External Contributions									
RF Interference	B	0.0	R	1.732	1	0.3	0.0	0.0	∞
Test Signal Variation	B	2.0	R	1.732	1	1	1.2	1.2	∞
Combined Std. Uncertainty (ABM Field)							4.0	6.1	
Expanded Std. Uncertainty							8.0	12.2	



13 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Last Cal.	Cal. Due Date
Audio Magnetic 1D Field Probe	SPEAG	AM1DV3	3082	2020-02-27	2021-02-26
DAE	SPEAG	DAE4	1291	2020-02-24	2021-02-23
Universal Radio Communication Tester	R&S	CMU 200	118133	2020-05-17	2021-05-16
Universal Radio Communication Tester	R&S	CMW 500	146734	2020-05-17	2021-05-16
Audio Magnetic Calibration Coil	SPEAG	AMCC	1101	2017-11-22	2020-11-21
TMFS	SPEAG	SE UMS 021 AA	1018	2017-11-22	2020-11-21
Hygrothermograph	Anymetr	NT-311	20150731	2020-05-17	2021-05-16
HAC Phantom	SPEAG	SD HAC P01 BB	1117	2017-11-22	2020-11-21
DAC	Sound Devices	USBPre 2	HB1420183010	/	/
Software for Test	Speag	DASY5	/	/	/

*****END OF REPORT *****

ANNEX A: Test Layout



Picture 1: HAC T-Coil System Layout



ANNEX B: Graph Results

NB

Plot 1 T-Coil LTE Band 2 Y transversal

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

LTE B2 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM

SNR(x,y,z) (13x13x1): Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

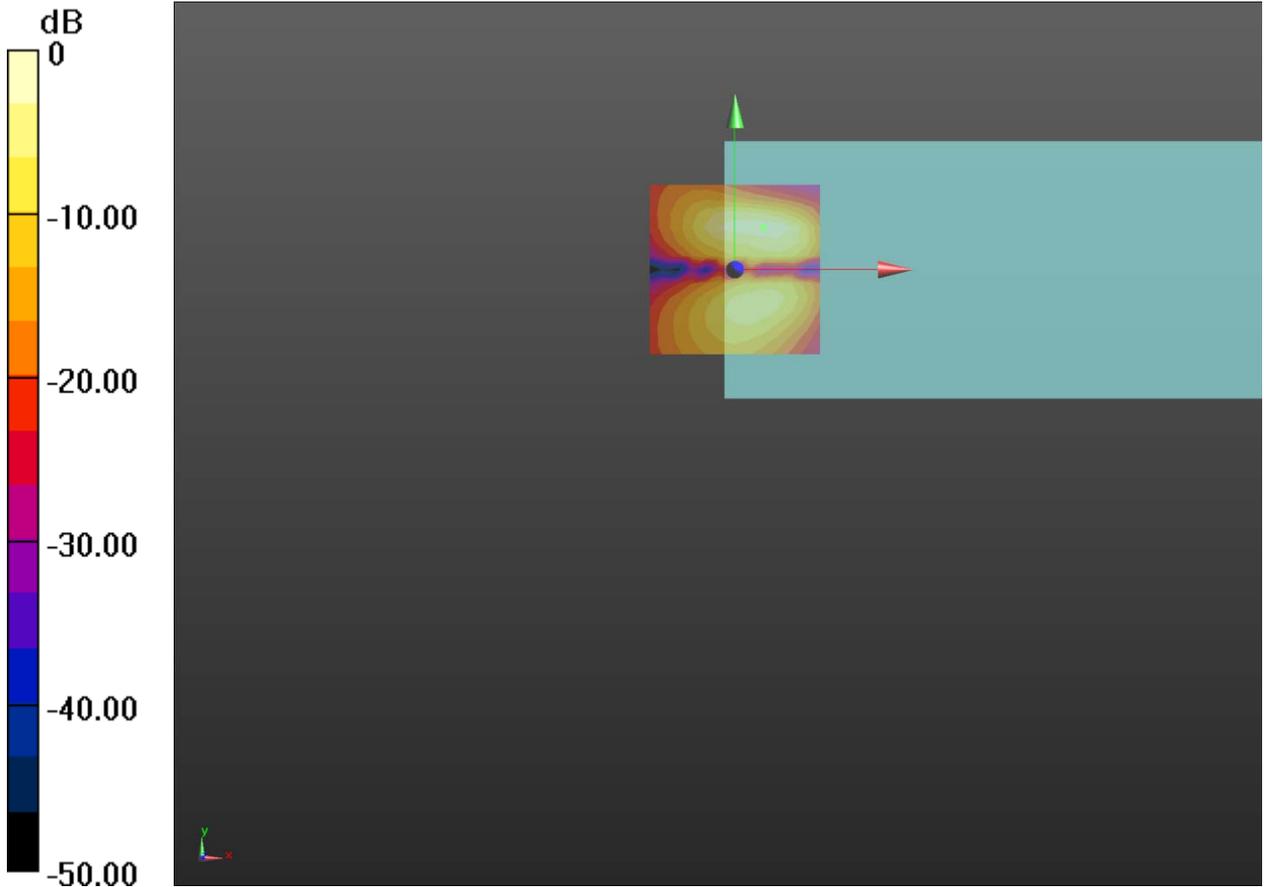
Cursor:

ABM1/ABM2 = 42.49 dB

ABM1 comp = 0.01 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, 12.5, 3.7 mm



0 dB = 133.2 = 42.49 dB

**Plot 2 T-Coil LTE Band 2 Z Axial**

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2020/2/27

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

LTE B2 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.87 dB

ABM1 comp = 4.02 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B2 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

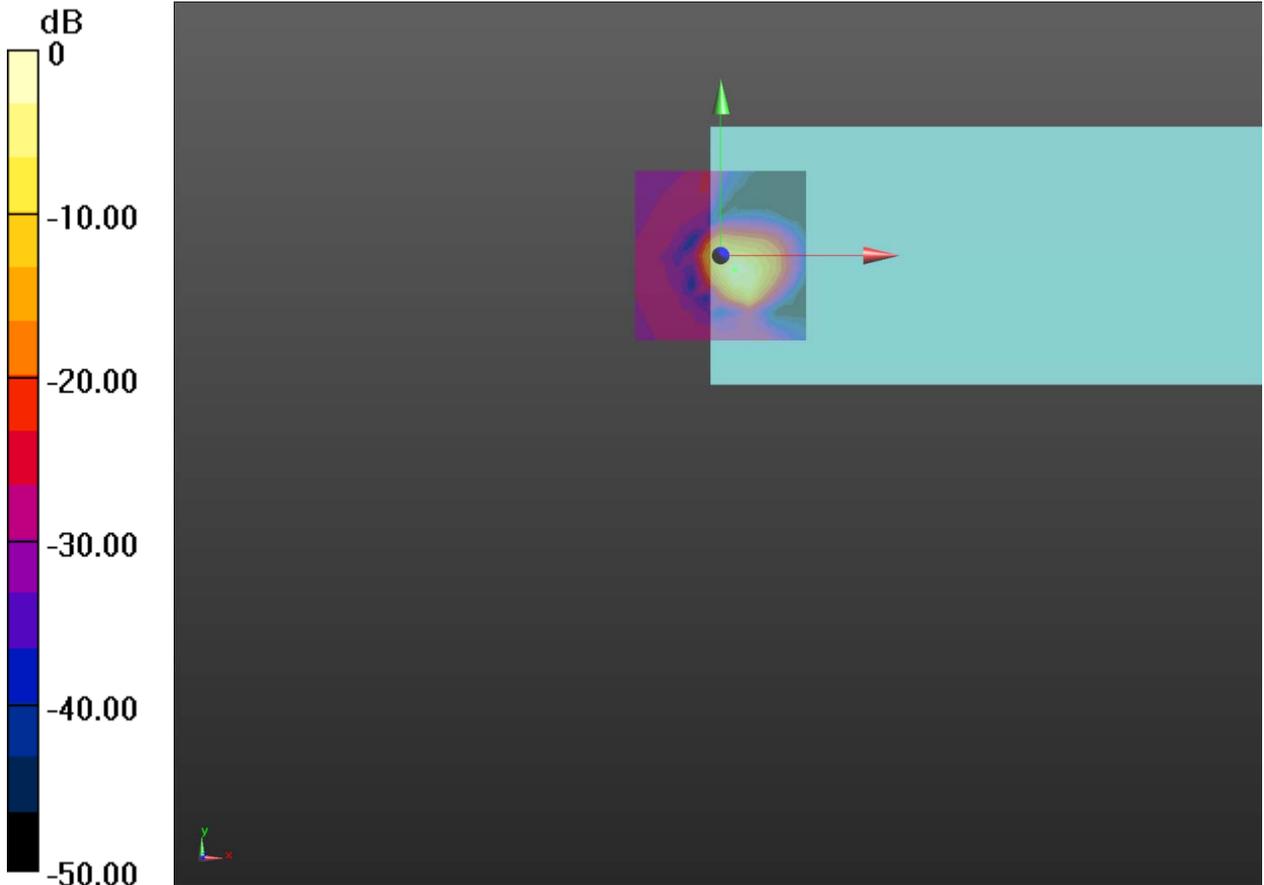
Device Reference Point: 0, 0, -6.3 mm

Cursor:

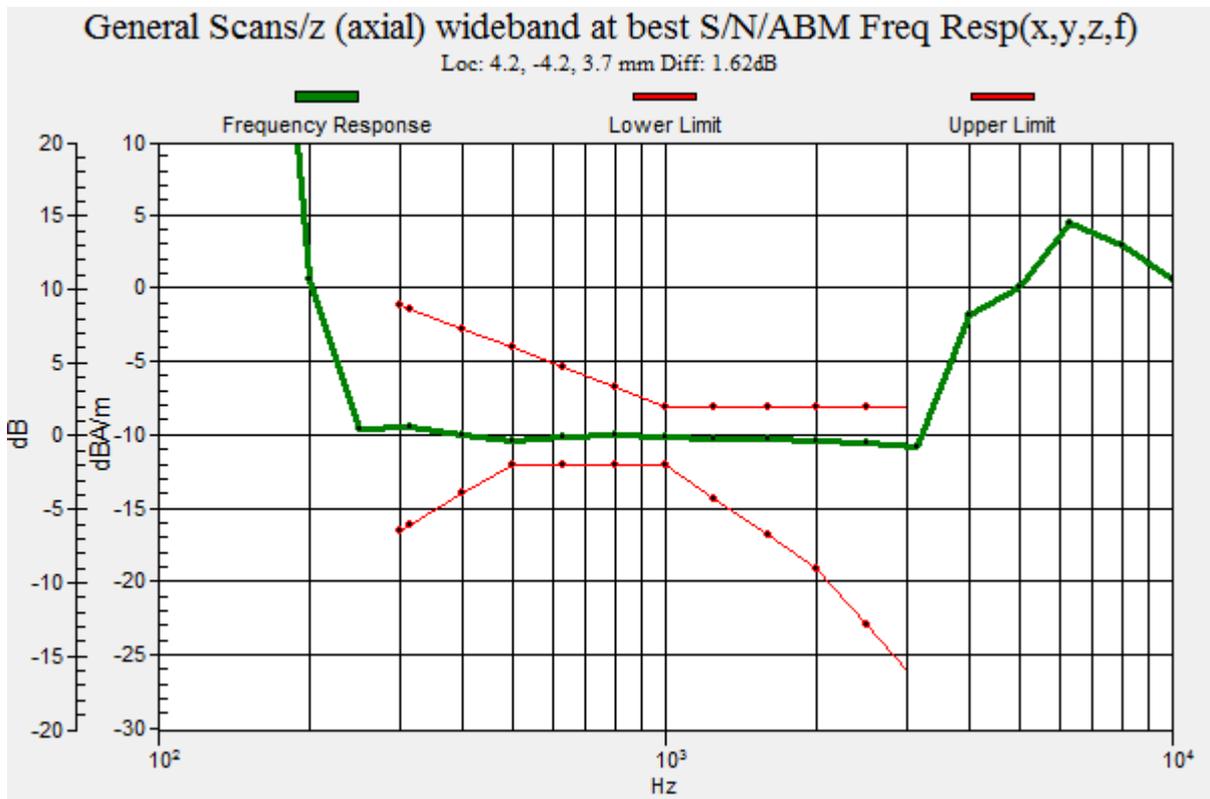
Diff = 1.62 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



0 dB = 439.9 = 52.87 dB



**Plot 3 T-Coil LTE Band 4 Y transversal**

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B4 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

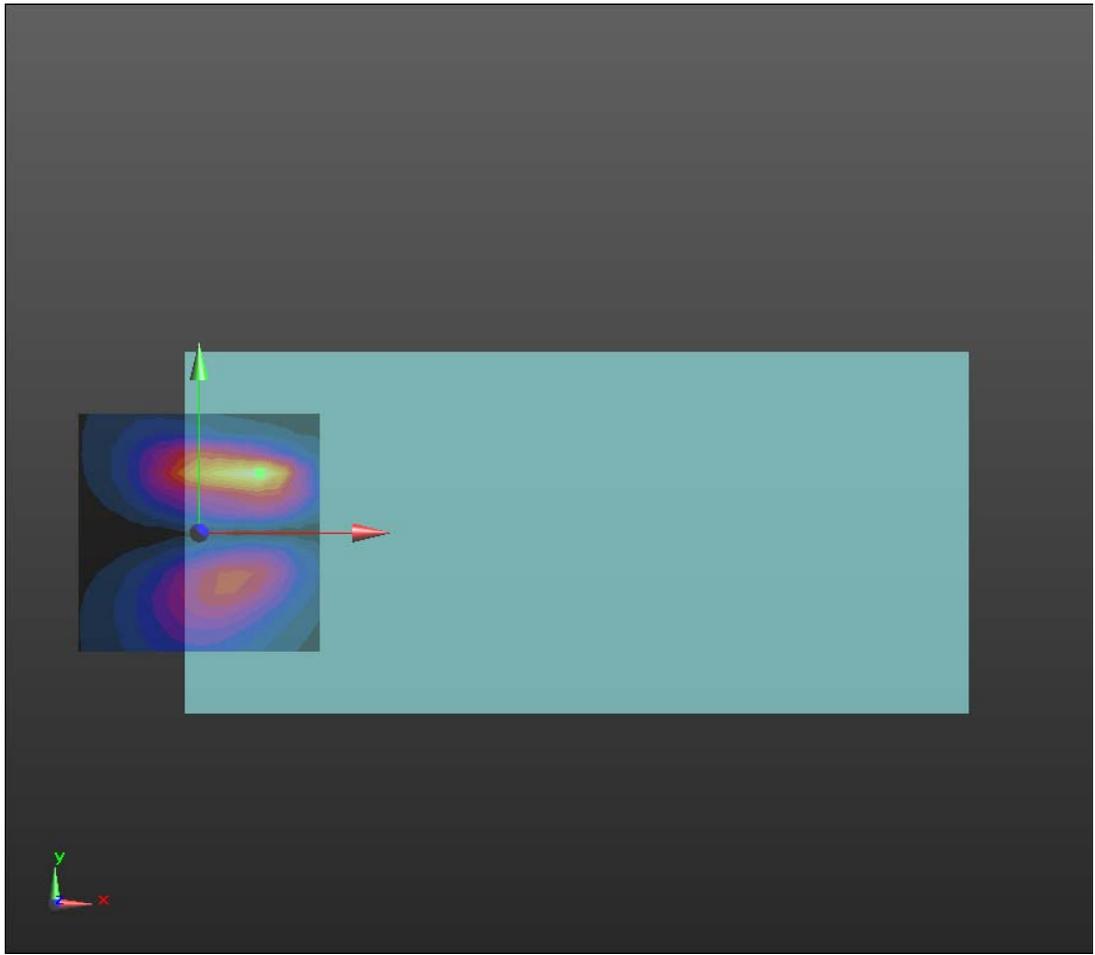
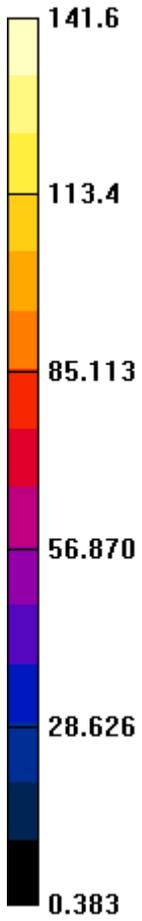
Cursor:

ABM1/ABM2 = 43.02 dB

ABM1 comp = 0.92 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 4 T-Coil LTE Band 4 Z Axial**

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B4 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.66 dB

ABM1 comp = 2.71 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B4 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

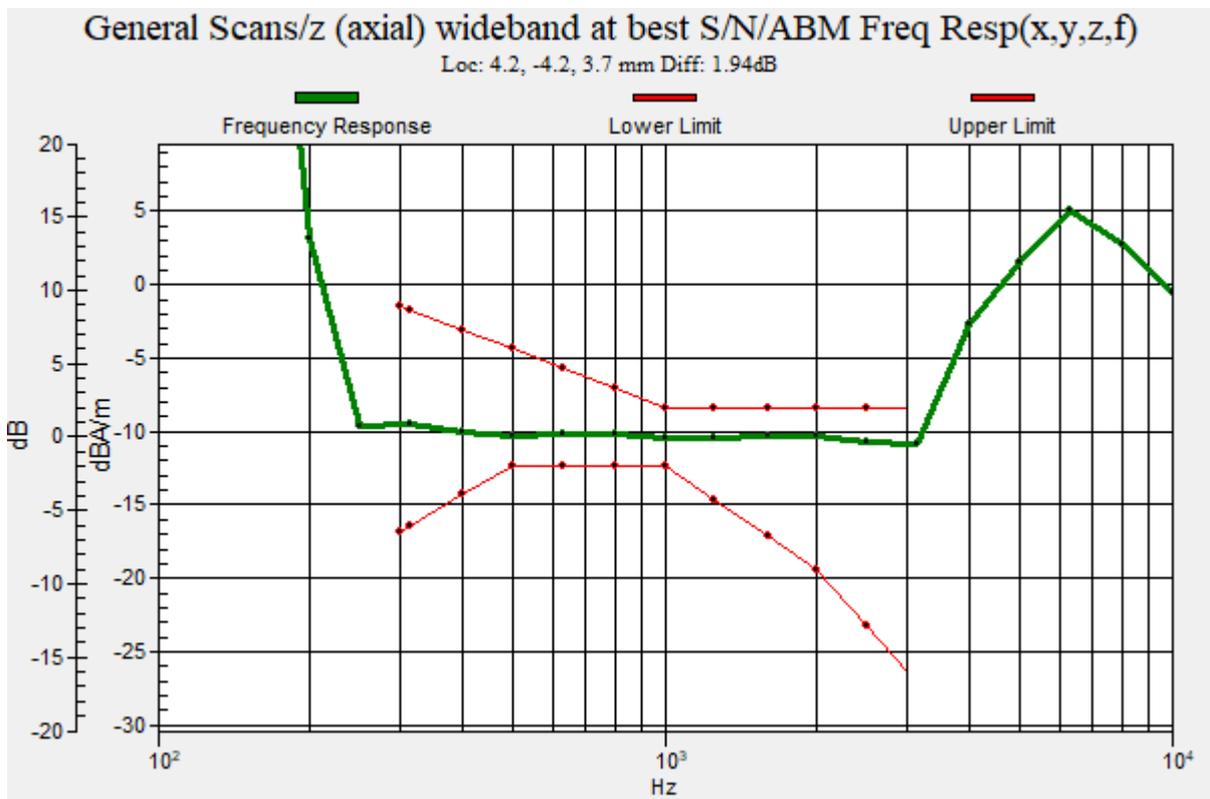
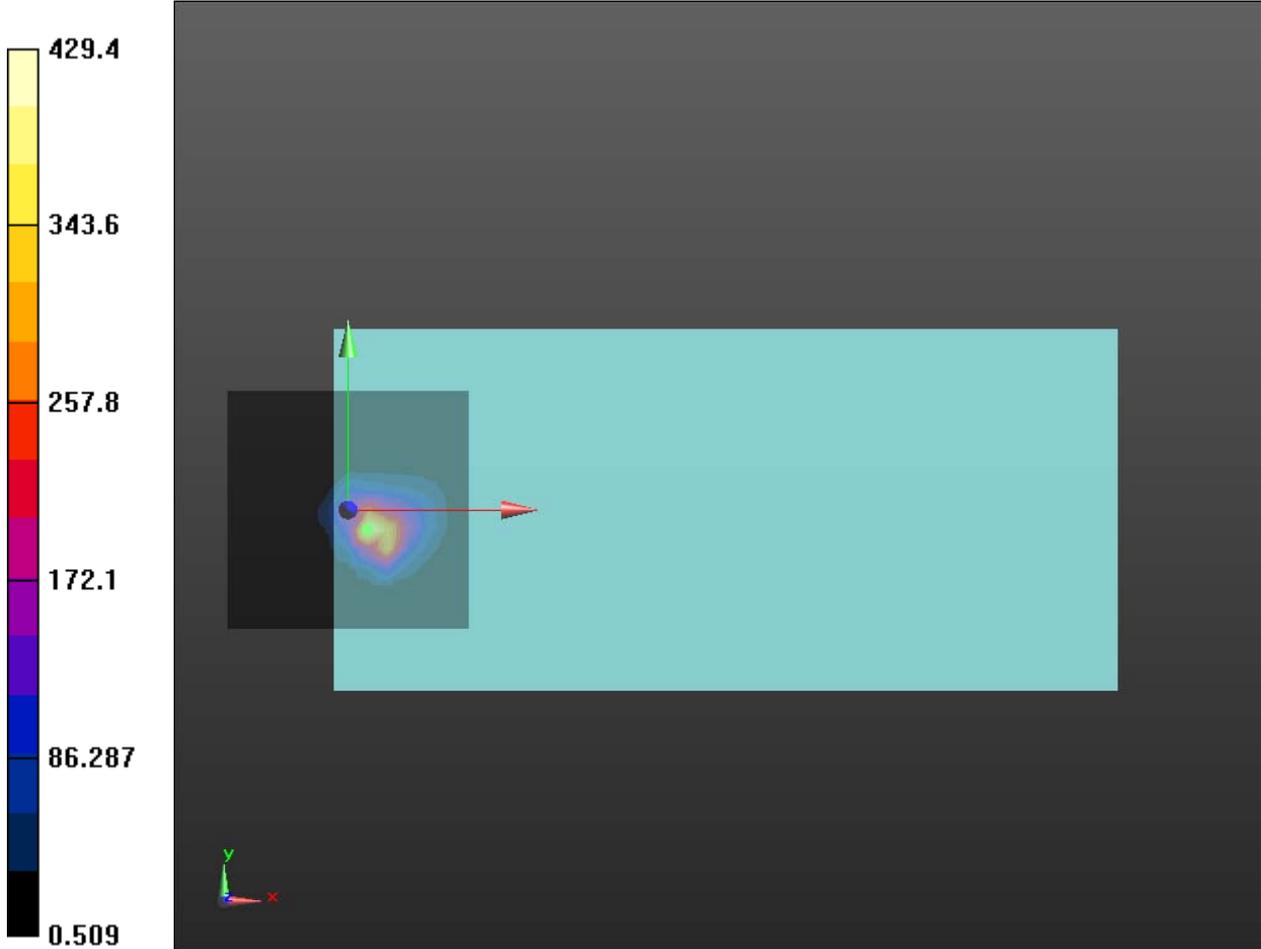
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.94 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 5 T-Coil LTE Band 5 Y transversal**

Date: 8/22/2020

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B5 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

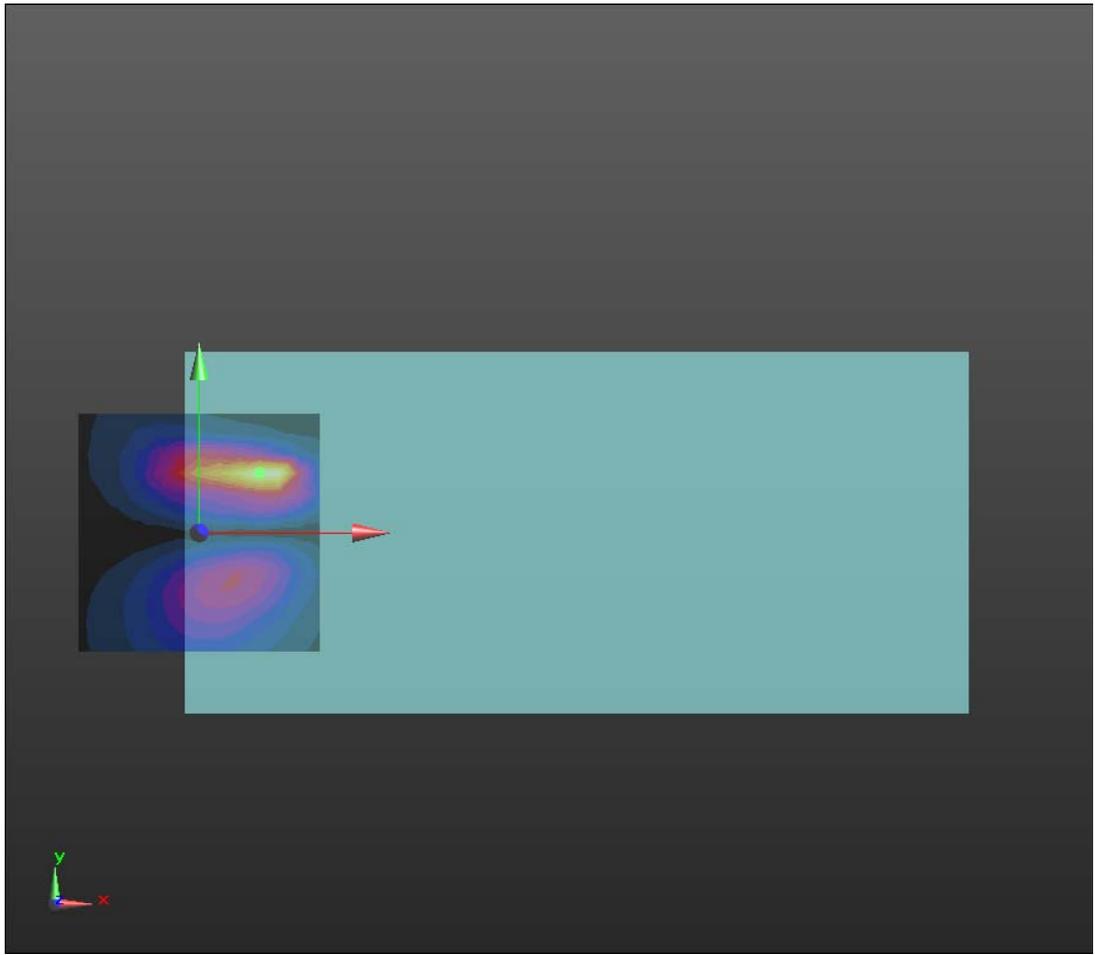
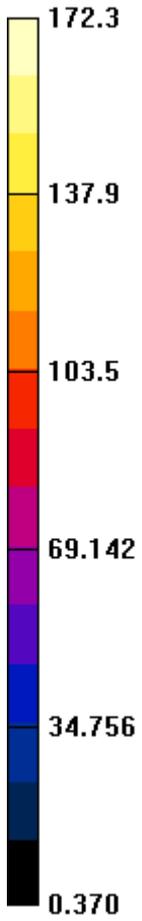
Cursor:

ABM1/ABM2 = 44.73 dB

ABM1 comp = 1.03 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 6 T-Coil LTE Band 5 Z Axial**

Date: 8/22/2020

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B5 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 53.64 dB

ABM1 comp = 2.81 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B5 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

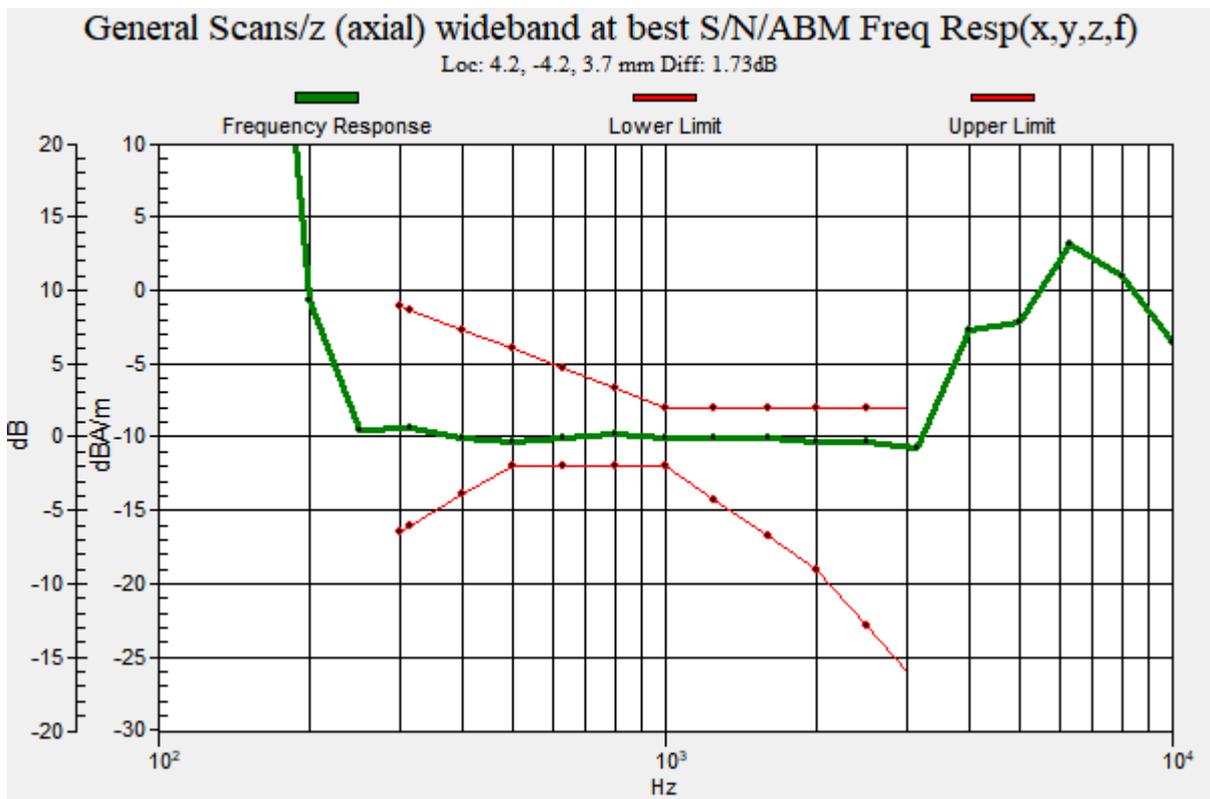
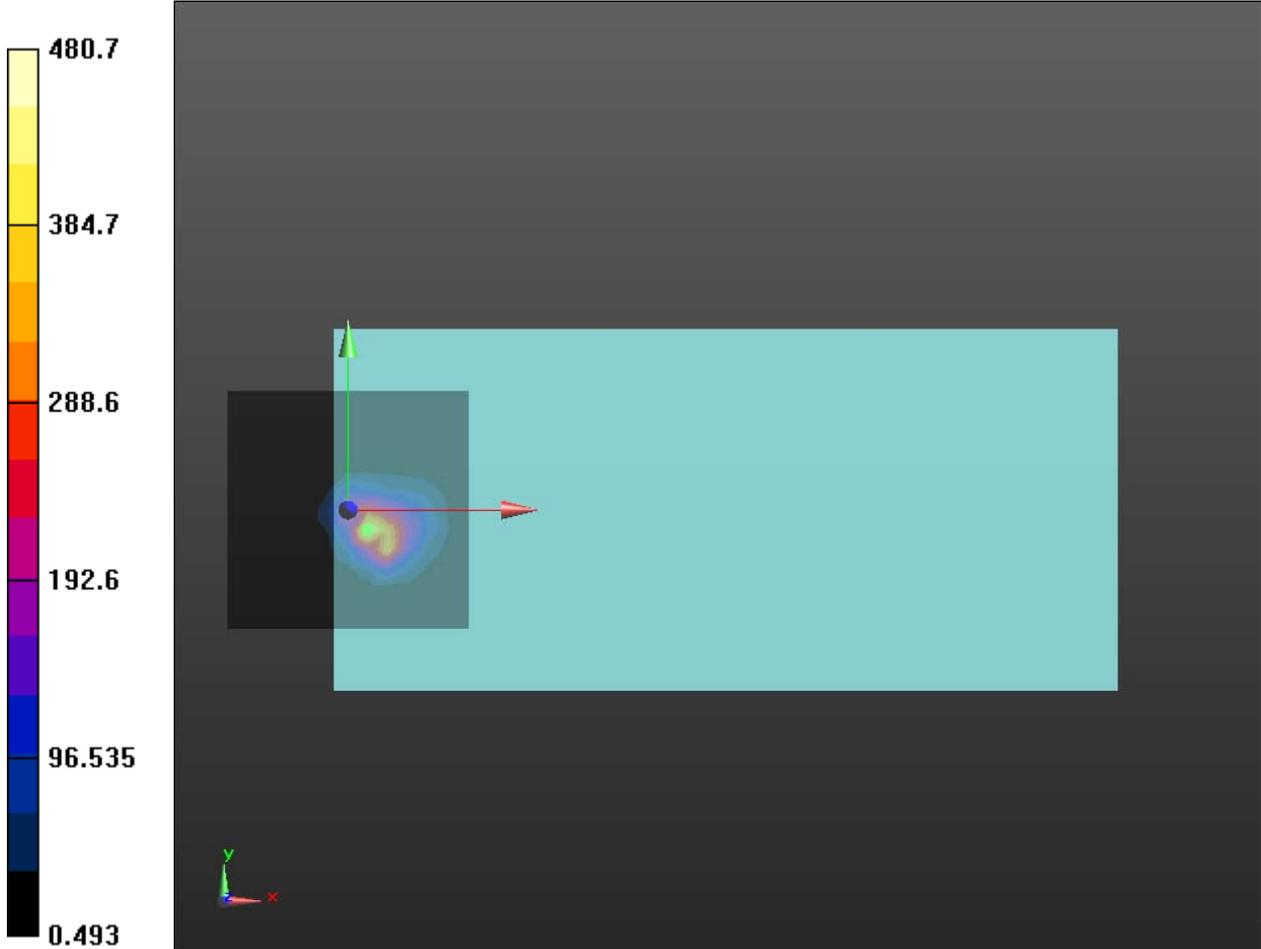
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.73 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 7 T-Coil LTE Band 12 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B12 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

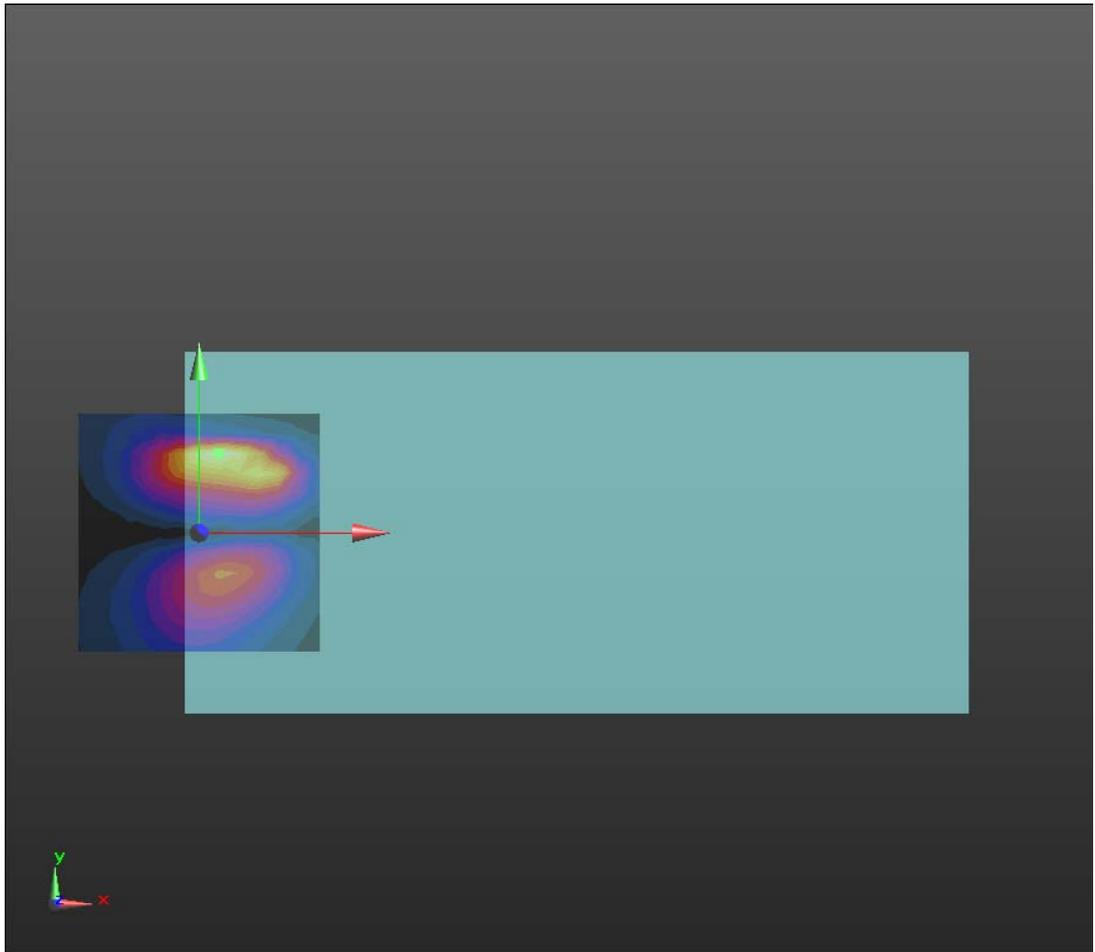
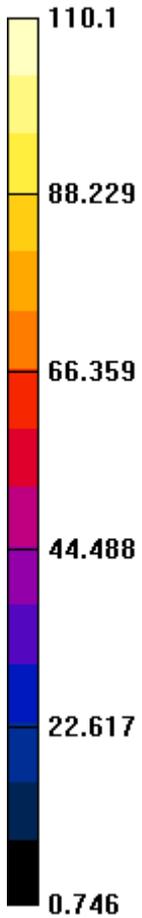
Cursor:

ABM1/ABM2 = 40.84 dB

ABM1 comp = -6.87 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, 16.7, 3.7 mm



**Plot 8 T-Coil LTE Band 12 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B12 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 51.55 dB

ABM1 comp = 0.91 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B12 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

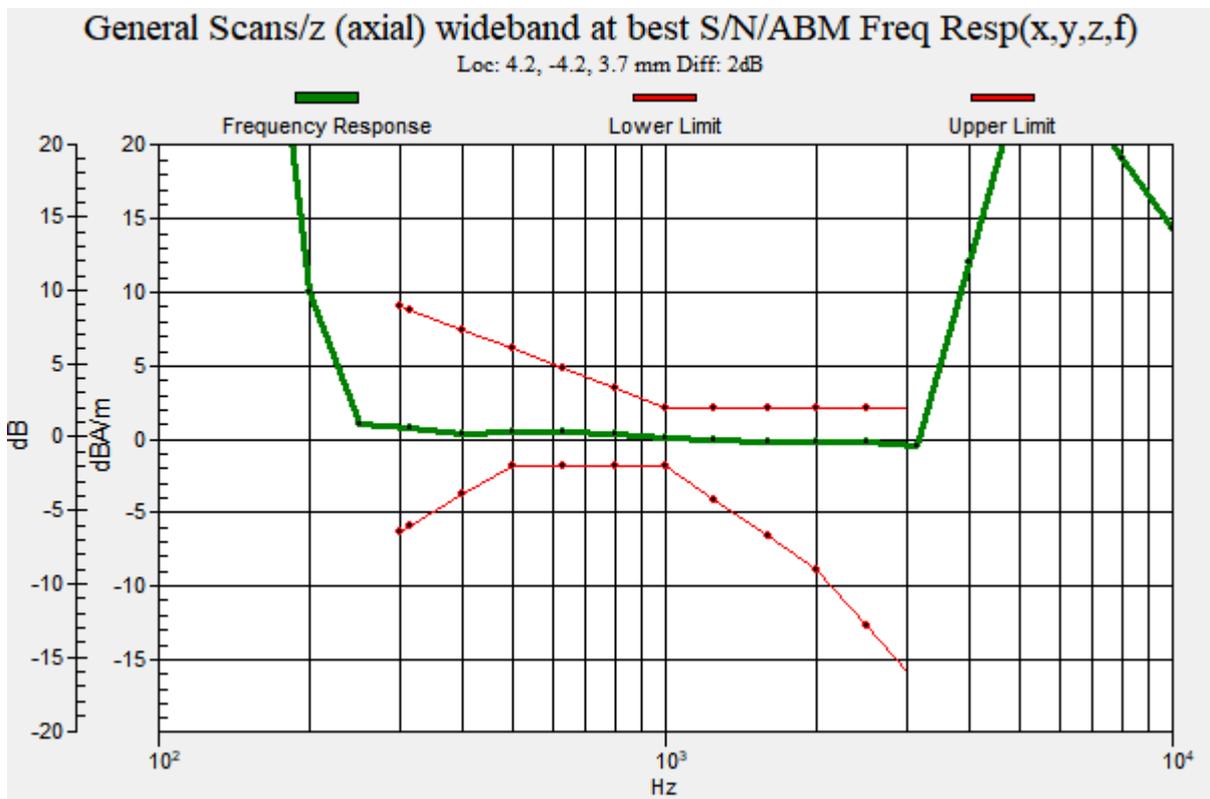
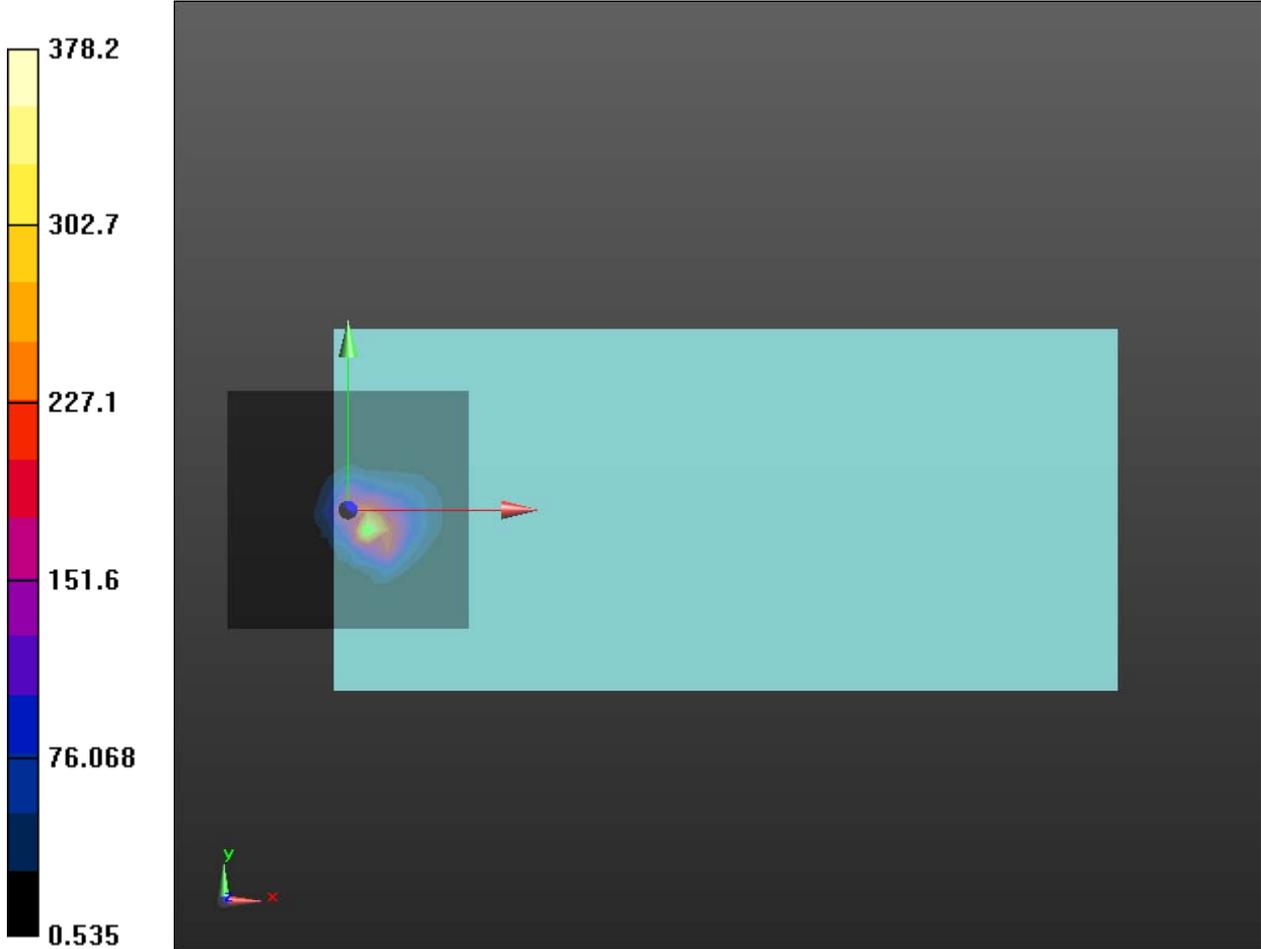
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 2.00 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 9 T-Coil LTE Band 13 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

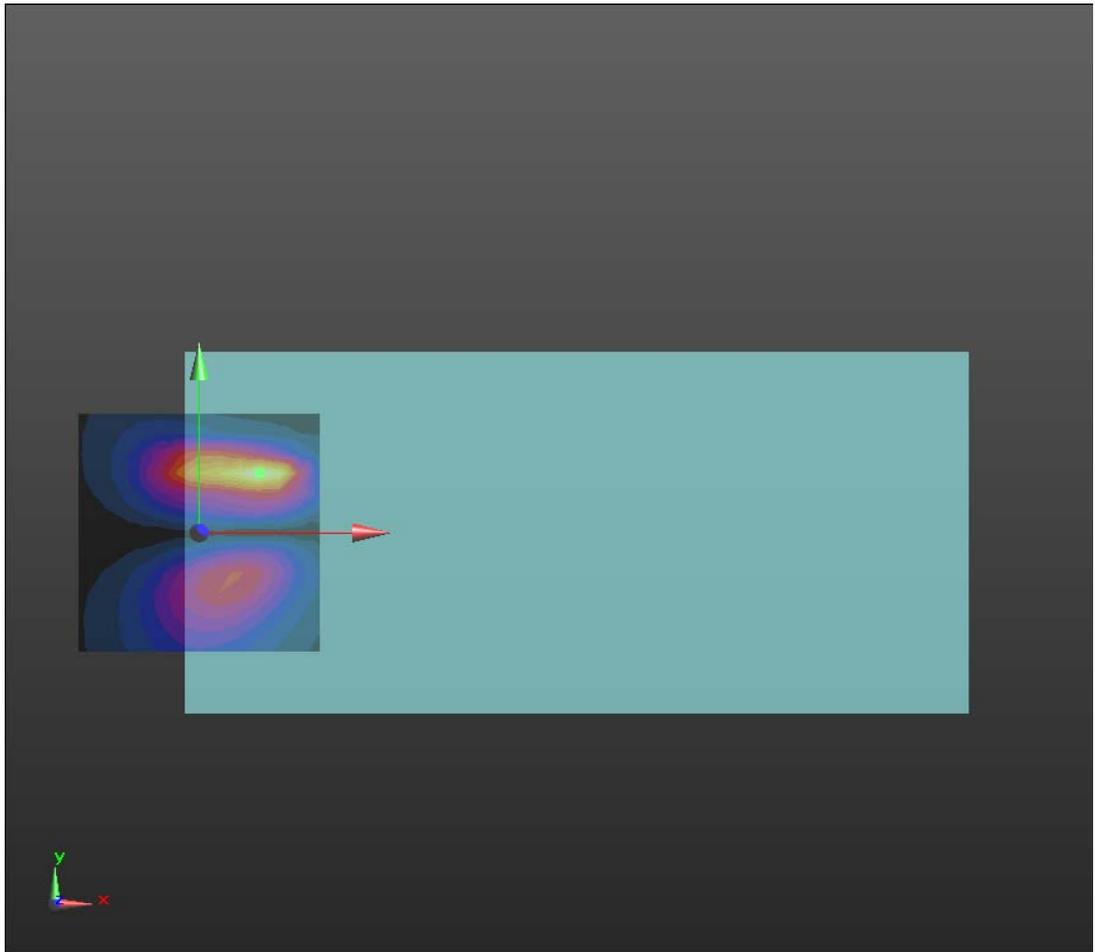
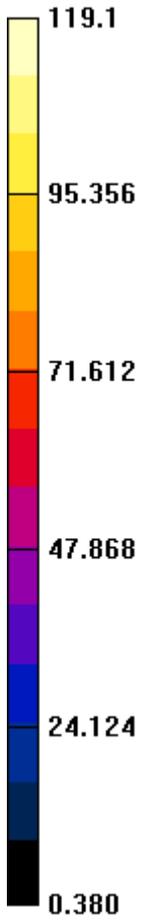
Cursor:

ABM1/ABM2 = 41.52 dB

ABM1 comp = -1.28 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 10 T-Coil LTE Band 13 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 51.21 dB

ABM1 comp = 0.95 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B13 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

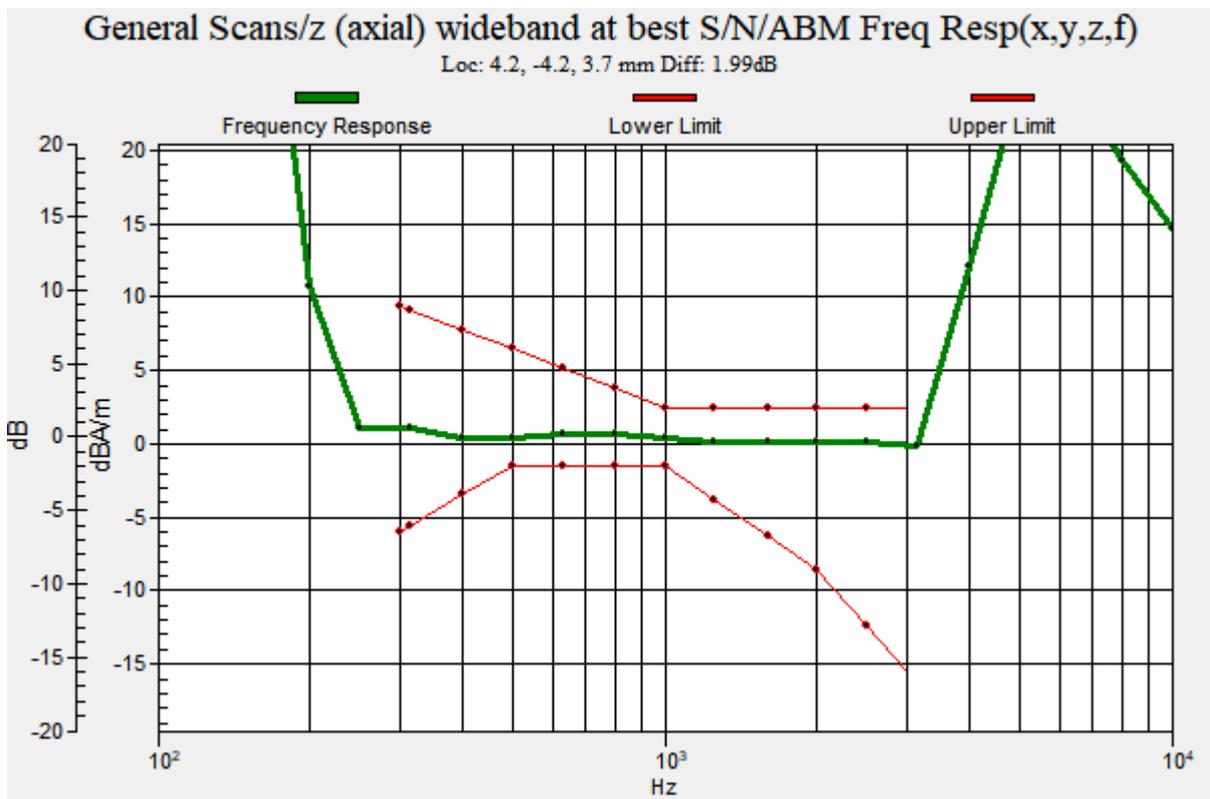
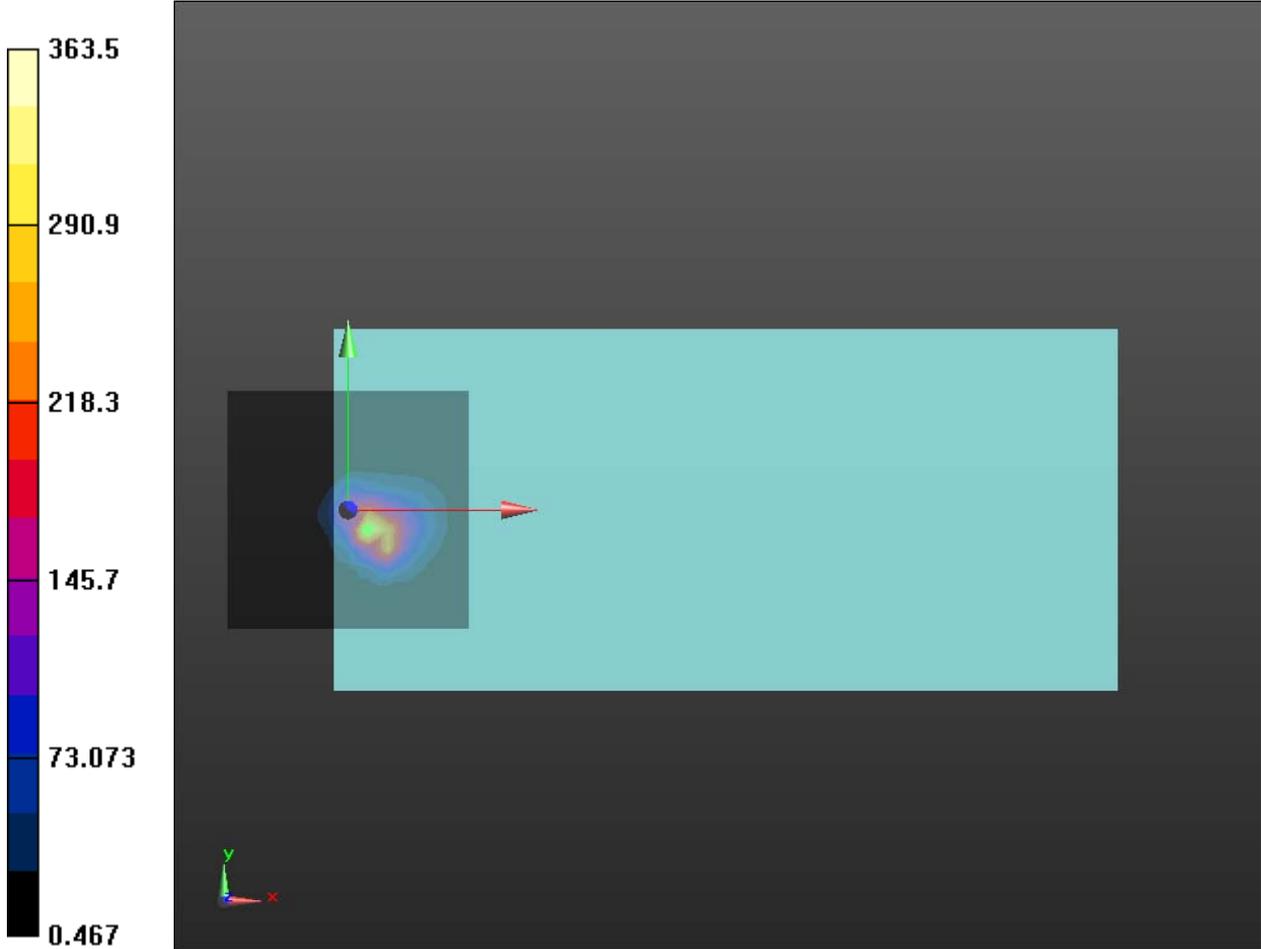
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.99 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 11 T-Coil LTE Band 66 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

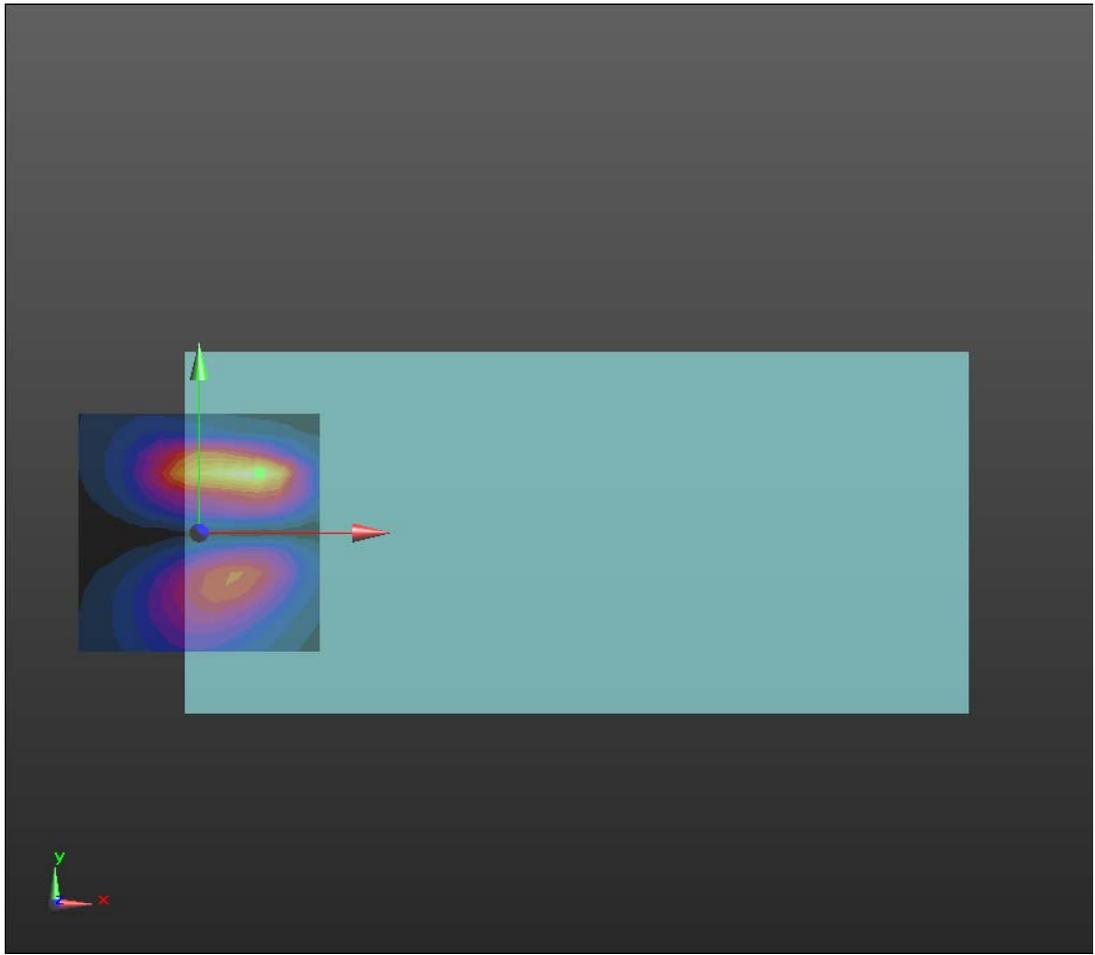
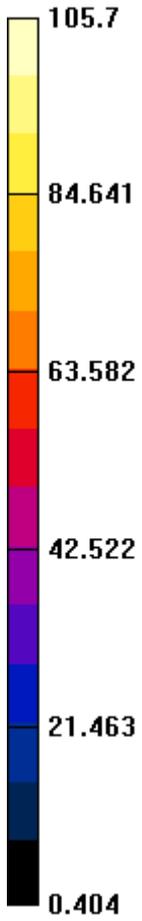
Cursor:

ABM1/ABM2 = 40.48 dB

ABM1 comp = -1.23 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 12 T-Coil LTE Band 66 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 51.02 dB

ABM1 comp = 0.93 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B13 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

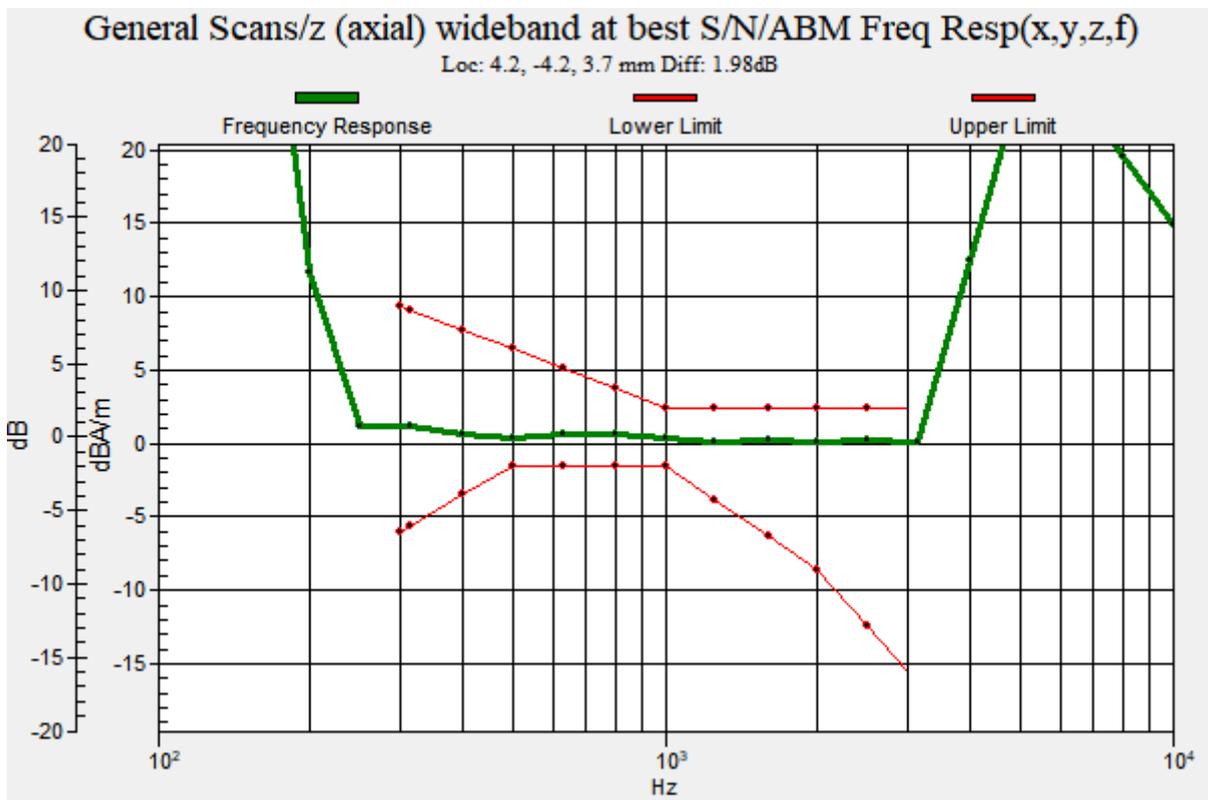
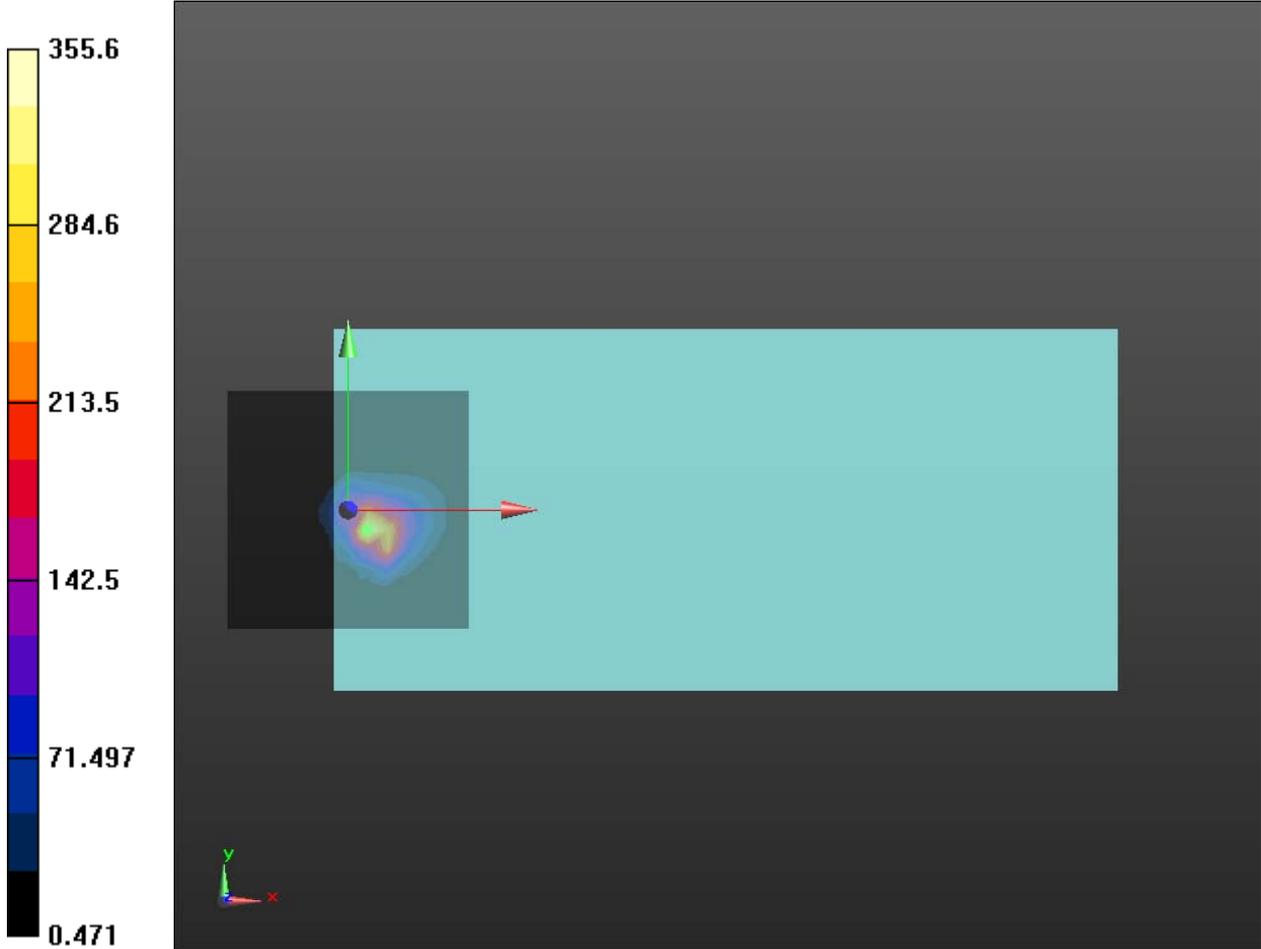
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.98 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 13 T-Coil WIFI 2.4G: 802.11b Y transversal**

Date: 9/1/2020

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11b HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

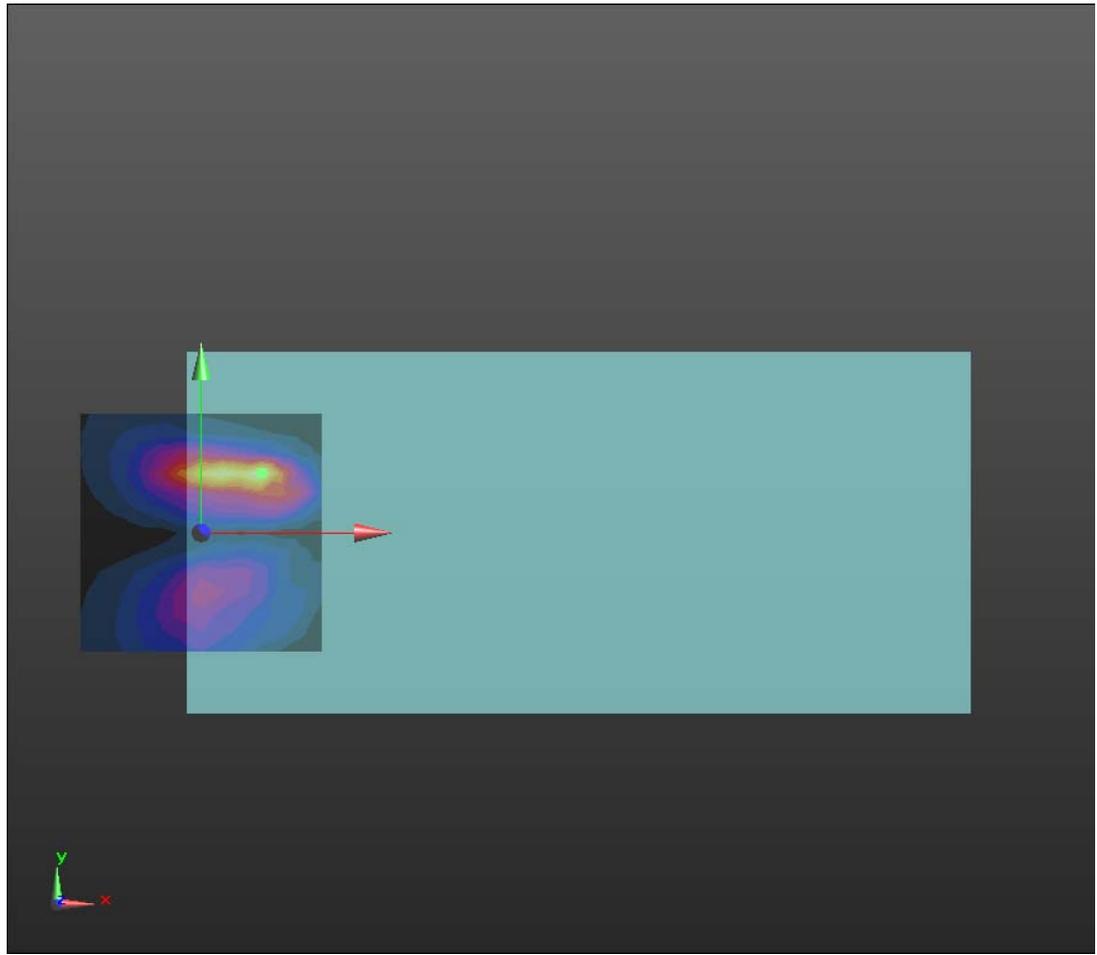
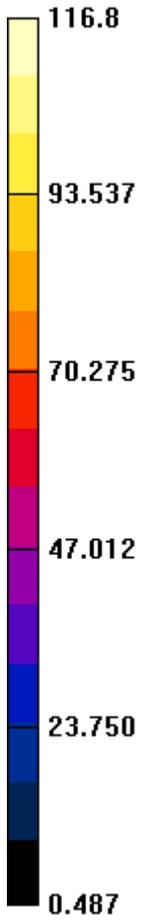
Cursor:

ABM1/ABM2 = 41.35 dB

ABM1 comp = -1.96 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 14 T-Coil WIFI 2.4G: 802.11b Z Axial**

Date: 9/1/2020

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11b HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 38.21 dB

ABM1 comp = 1.19 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11b HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

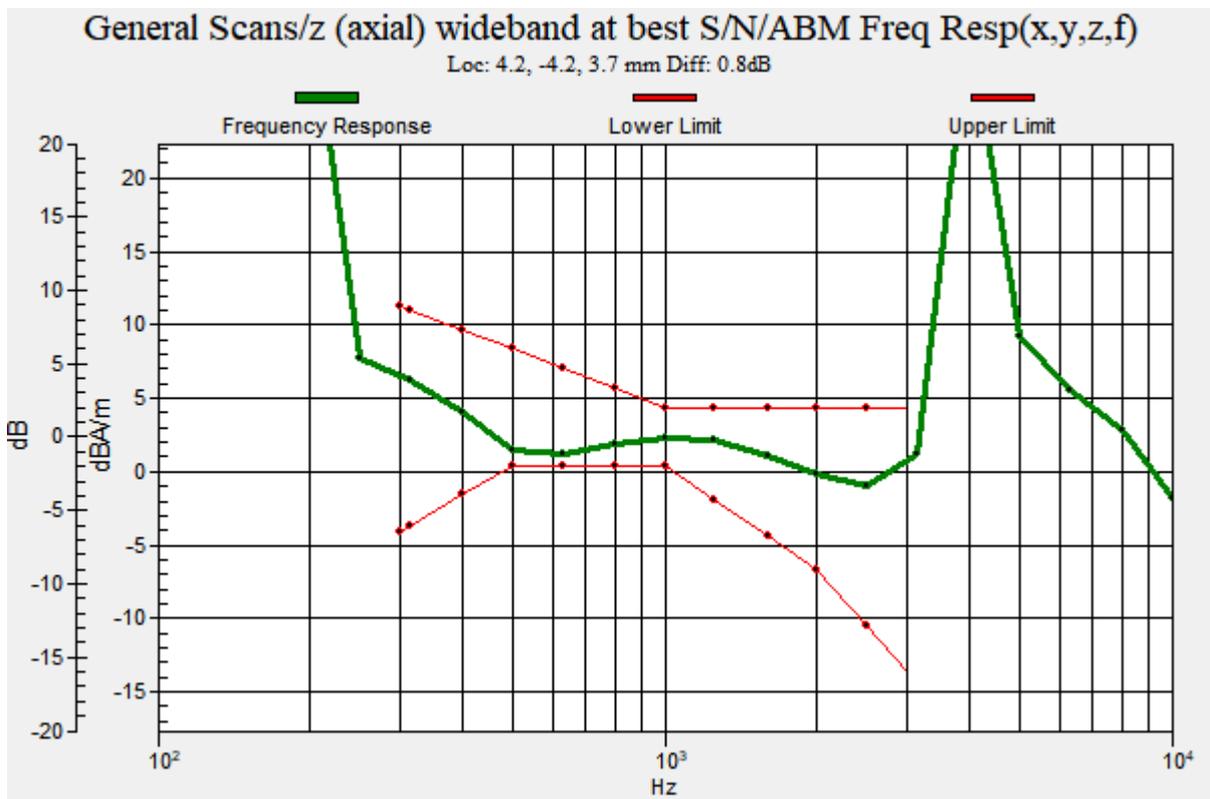
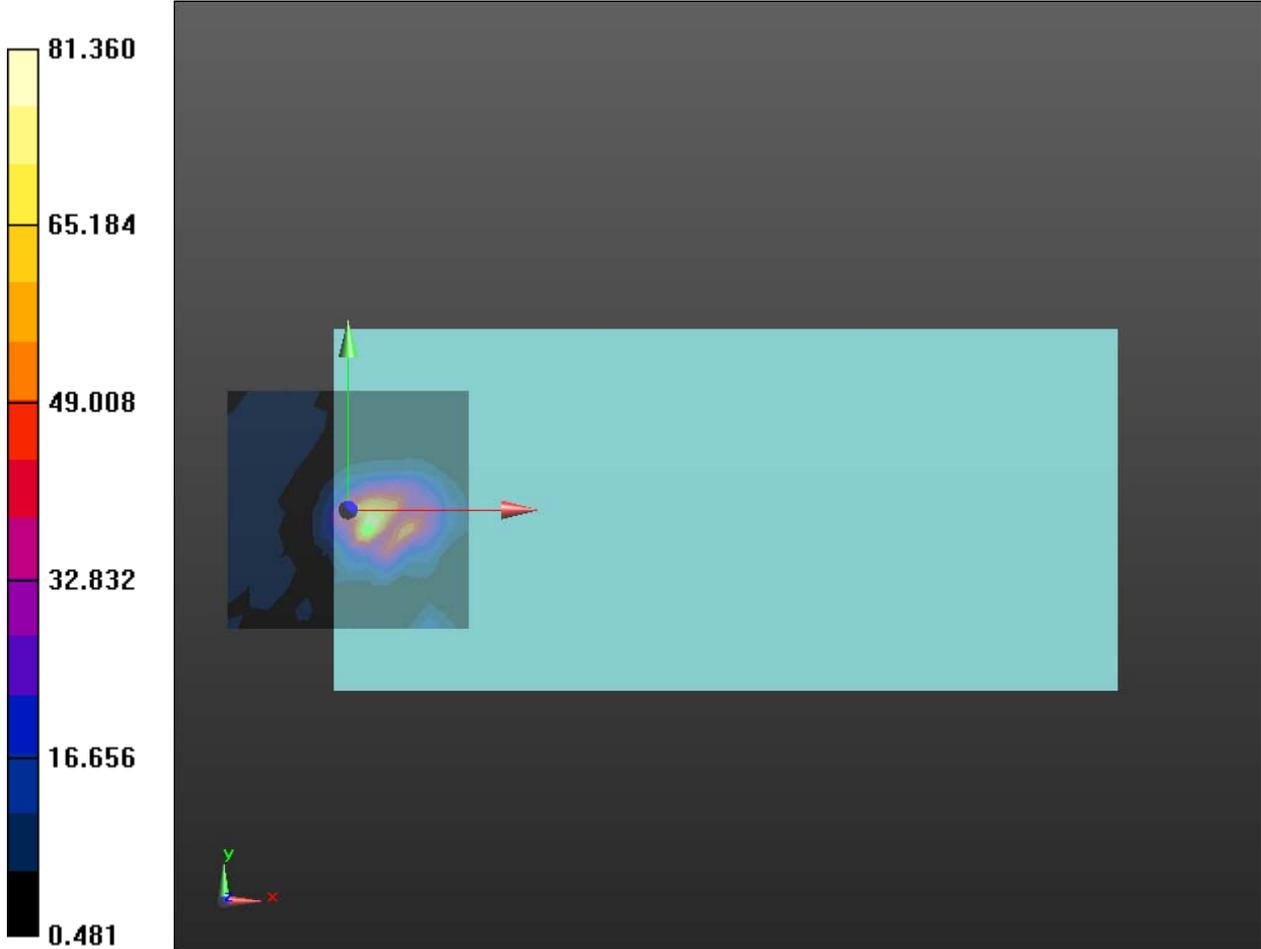
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 0.80 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 15 T-Coil WIFI 2.4G: 802.11g Y transversal**

Date: 8/29/2020

Communication System: UID 0, 802.11g (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11g HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

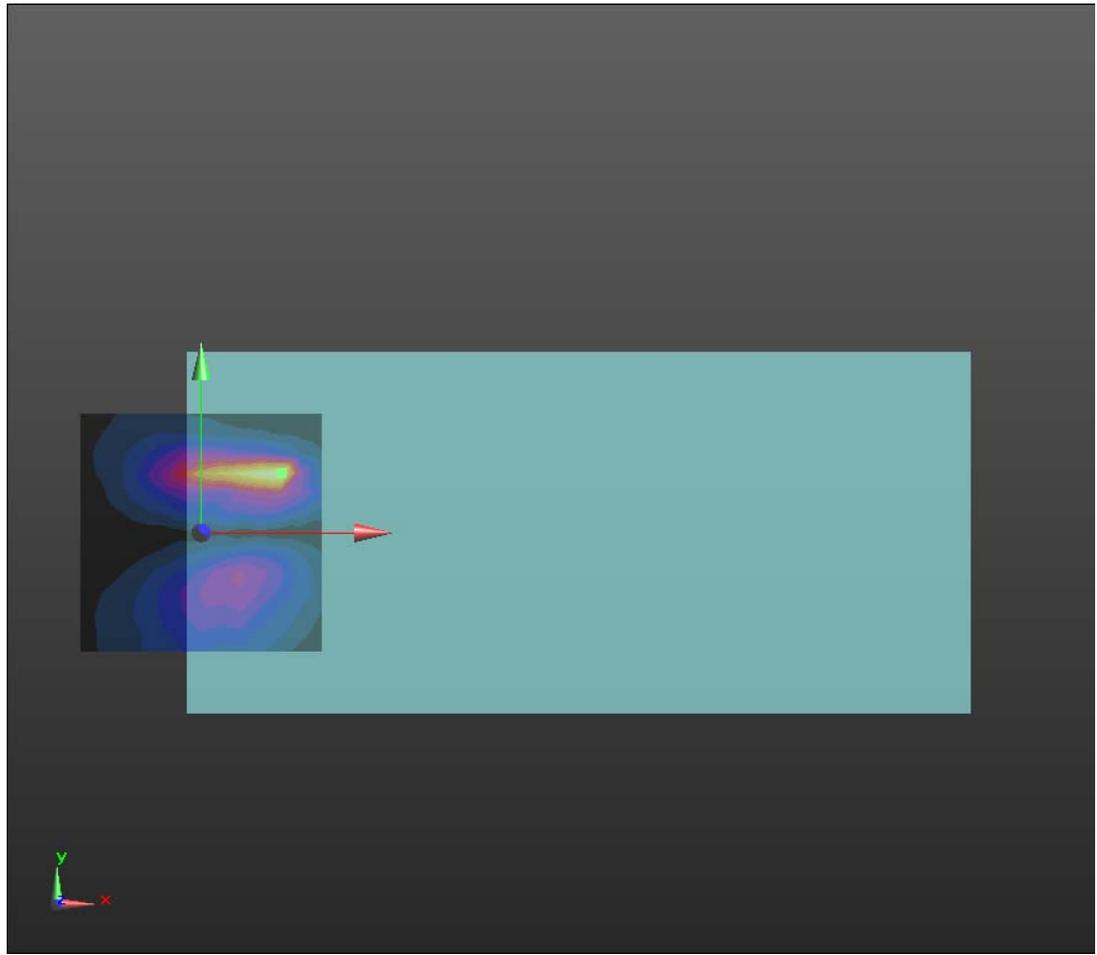
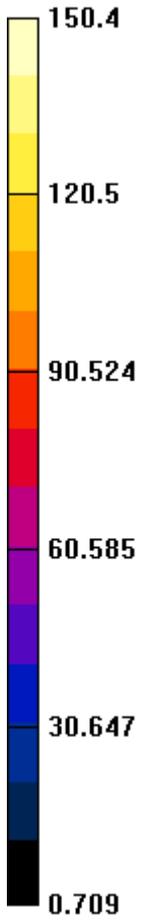
Cursor:

ABM1/ABM2 = 43.54 dB

ABM1 comp = -2.26 dBA/m

BWC Factor = 0.17 dB

Location: 16.7, 12.5, 3.7 mm



**Plot 16 T-Coil WIFI 2.4G: 802.11g Z Axial**

Date: 8/29/2020

Communication System: UID 0, 802.11g (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11g HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 44.19 dB

ABM1 comp = 0.86 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11g HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

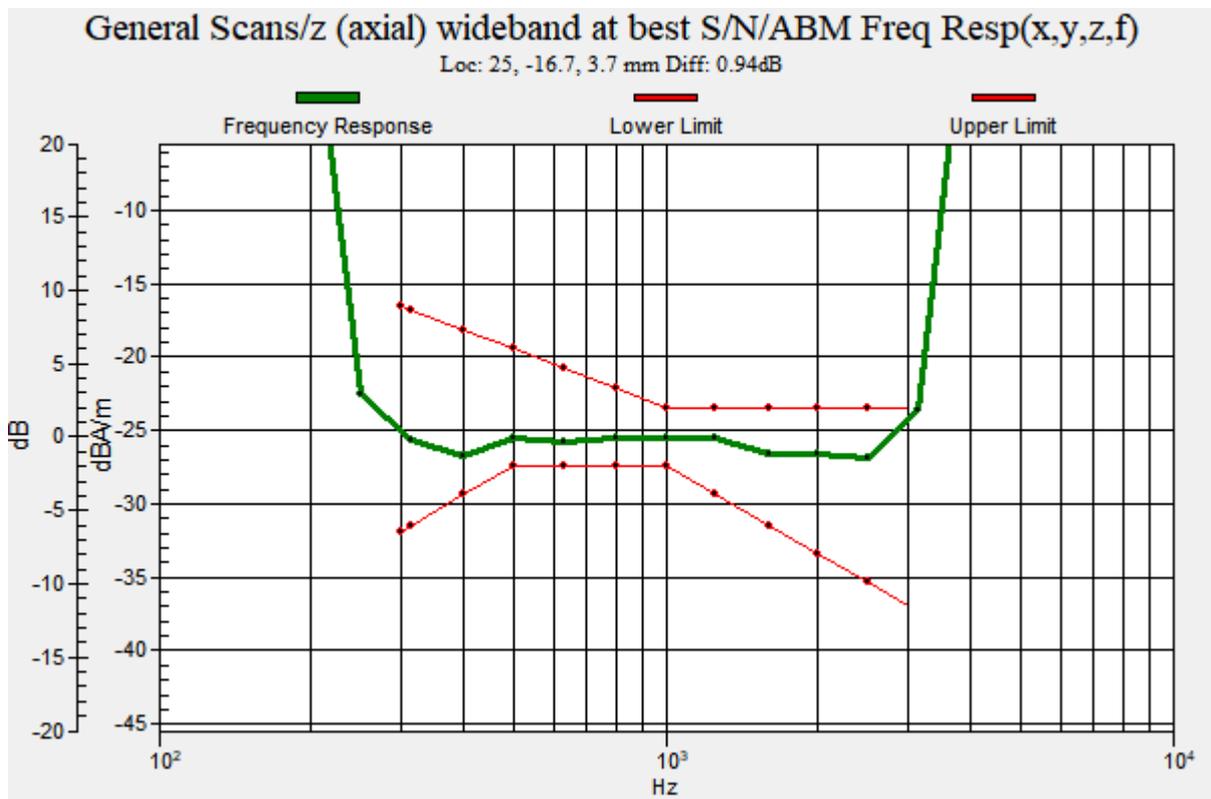
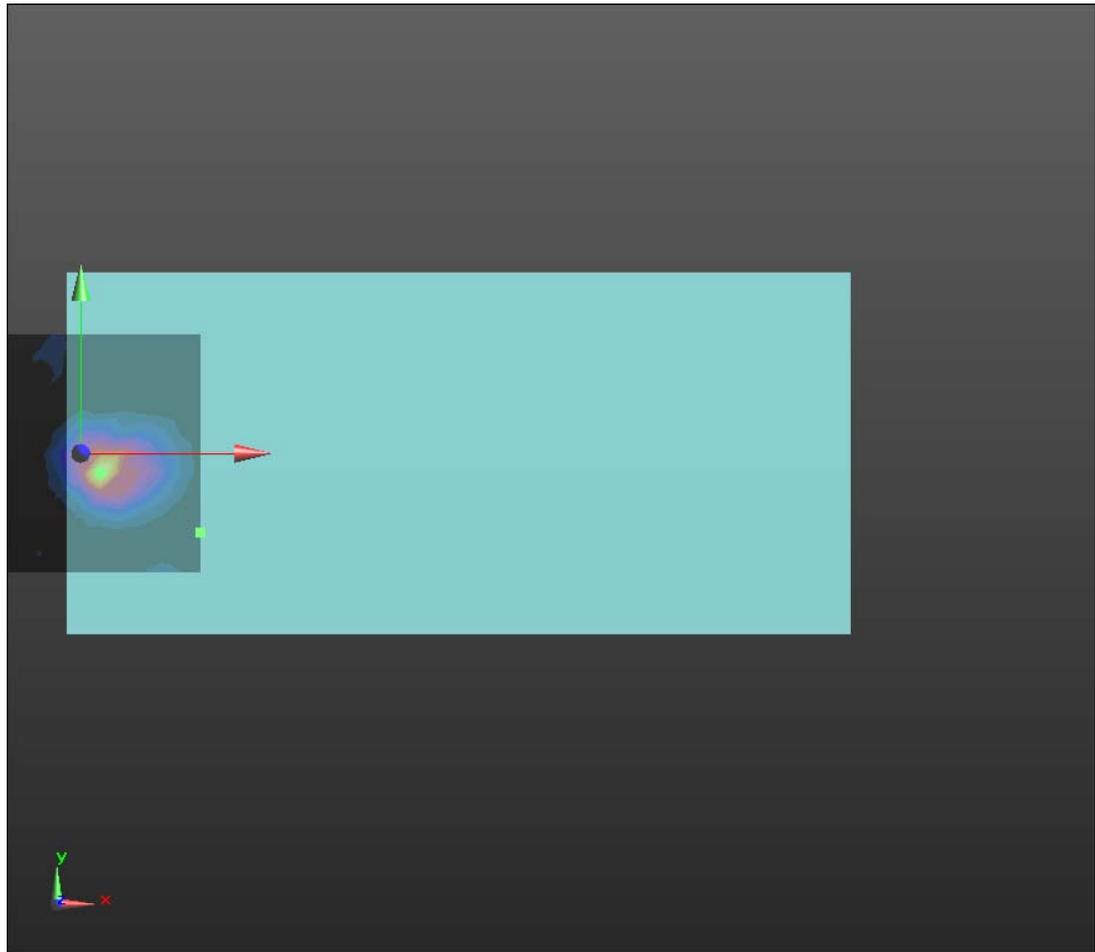
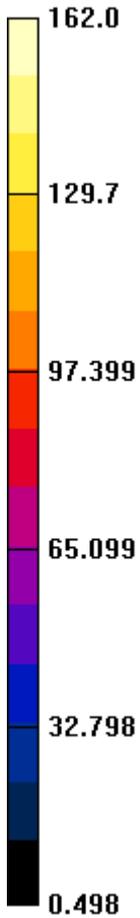
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 0.94 dB

BWC Factor = 10.81 dB

Location: 25, -16.7, 3.7 mm



**Plot 17 T-Coil WIFI 2.4G: 802.11n Y transversal**

Date: 9/11/2020

Communication System: UID 0, 802.11n (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11n HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

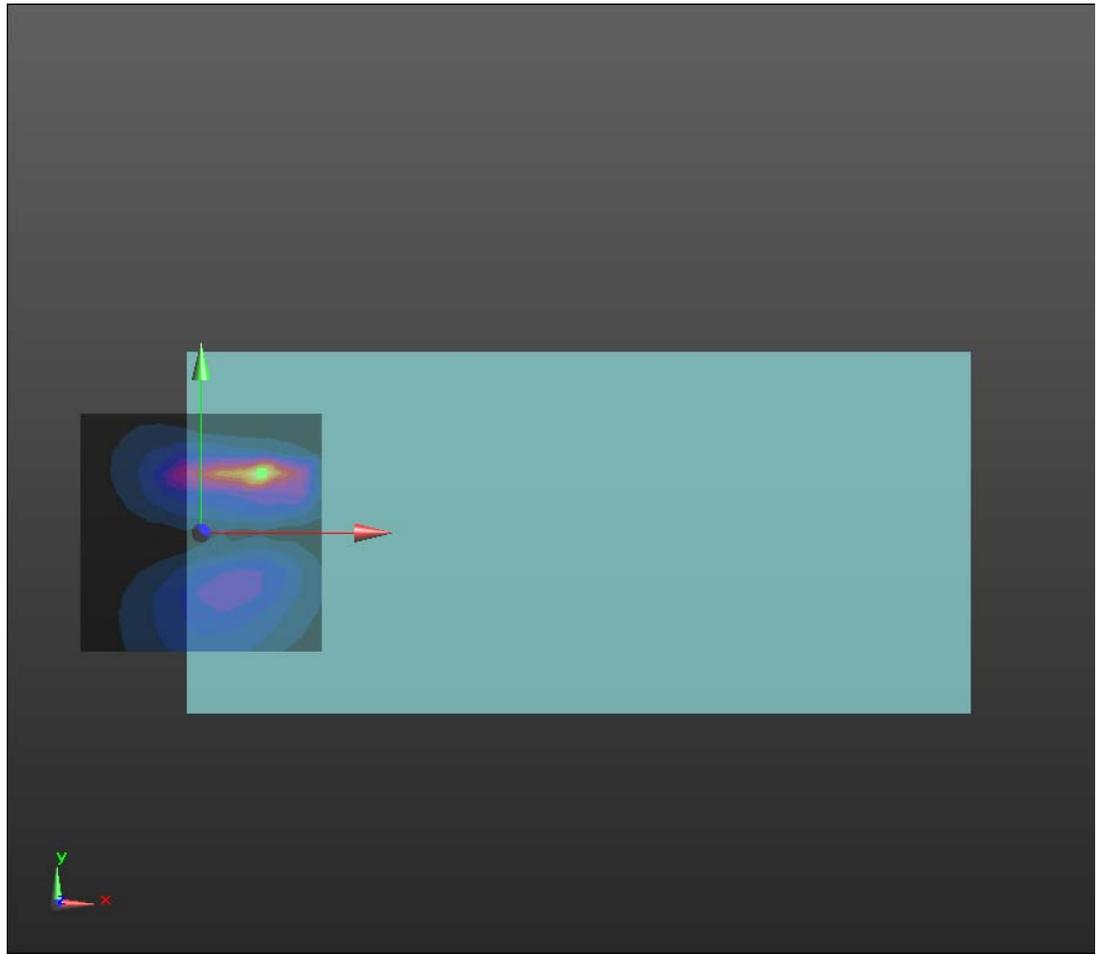
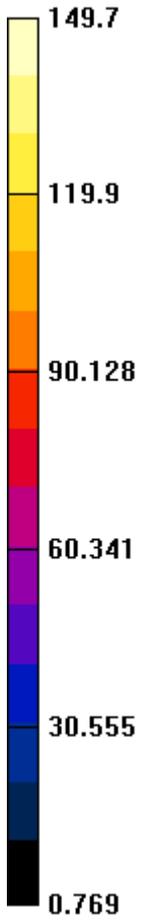
Cursor:

ABM1/ABM2 = 43.50 dB

ABM1 comp = -5.13 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 18 T-Coil WIFI 2.4G: 802.11n Z Axial**

Date: 9/11/2020

Communication System: UID 0, 802.11n (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11n HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 45.82 dB

ABM1 comp = -1.21 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11n HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

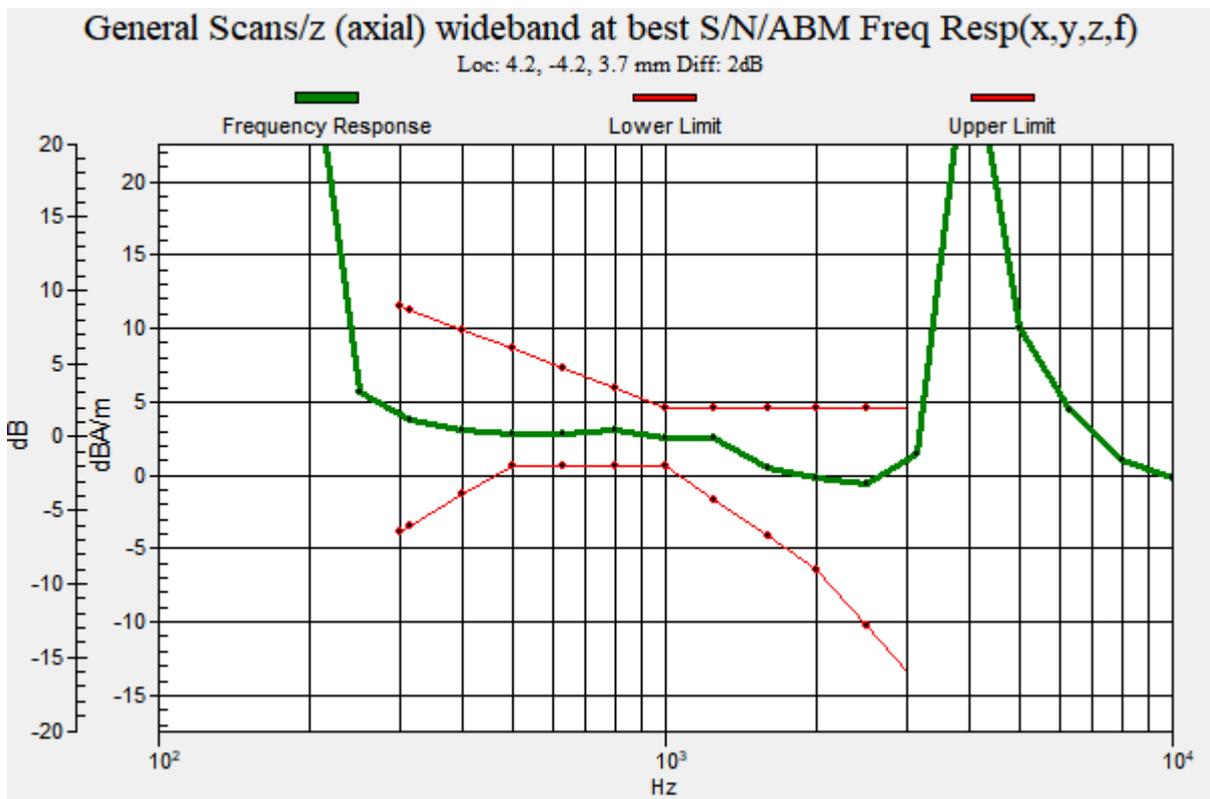
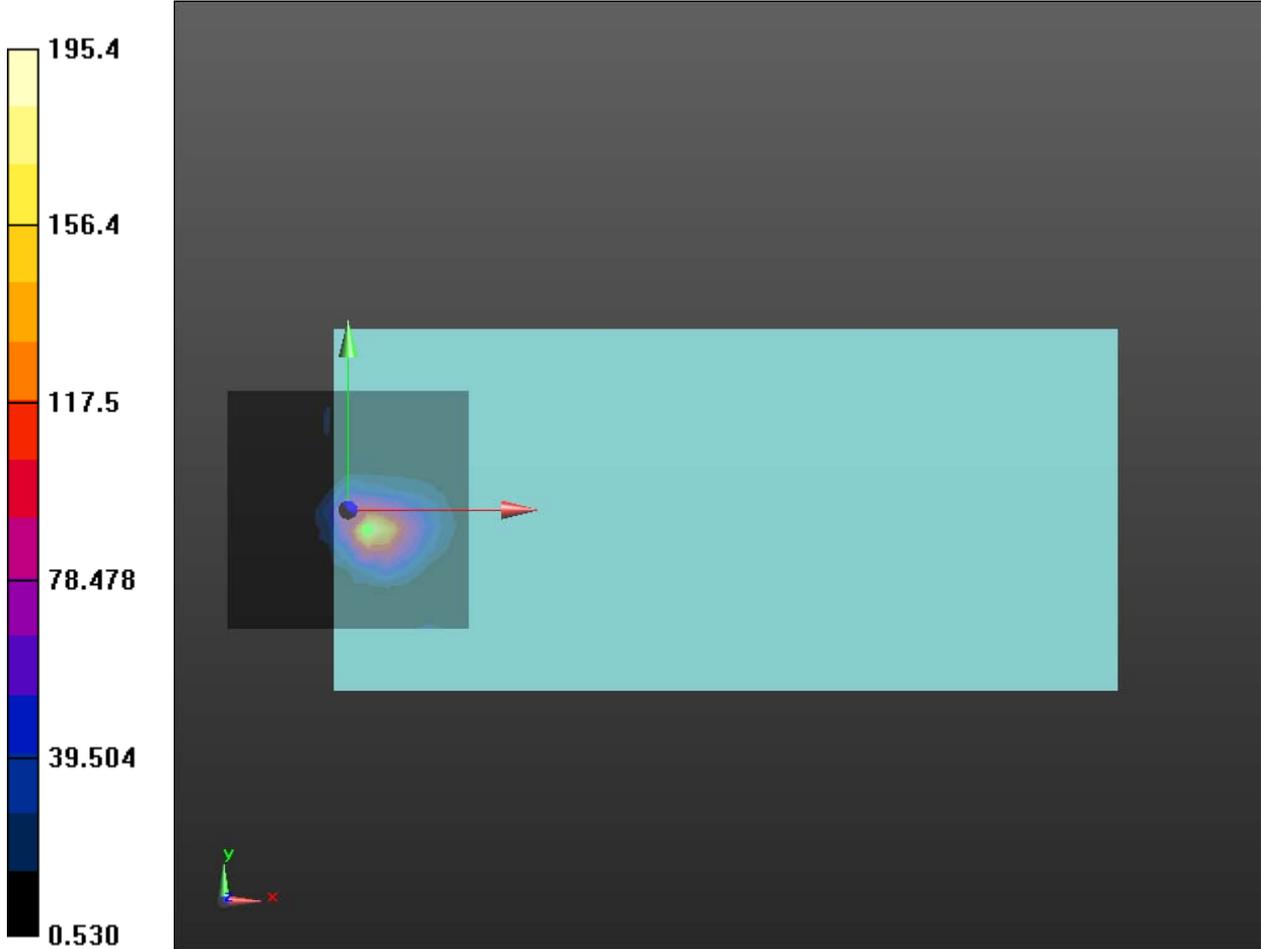
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 2.00 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 19 T-Coil WIFI 5G: 802.11a (U-NII-1) Y transversal**

Date: 9/8/2020

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

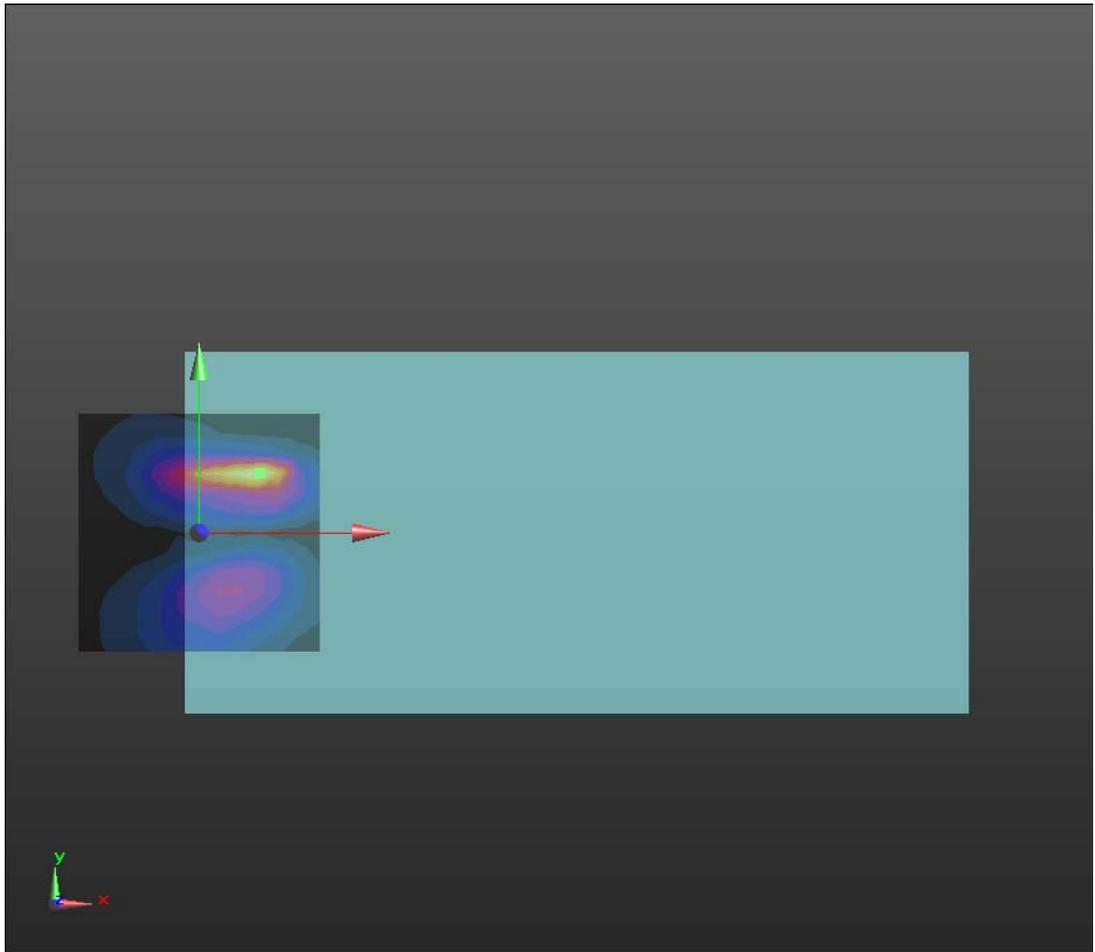
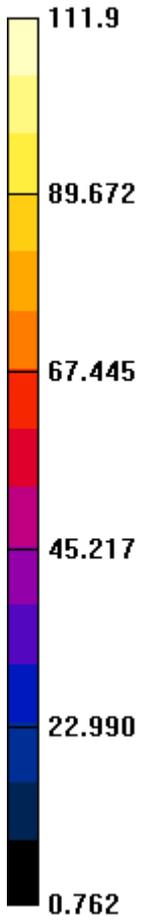
Cursor:

ABM1/ABM2 = 40.98 dB

ABM1 comp = -5.13 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 20 T-Coil WIFI 5G: 802.11a (U-NII-1) Z Axial**

Date: 9/8/2020

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 46.55 dB

ABM1 comp = -1.88 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

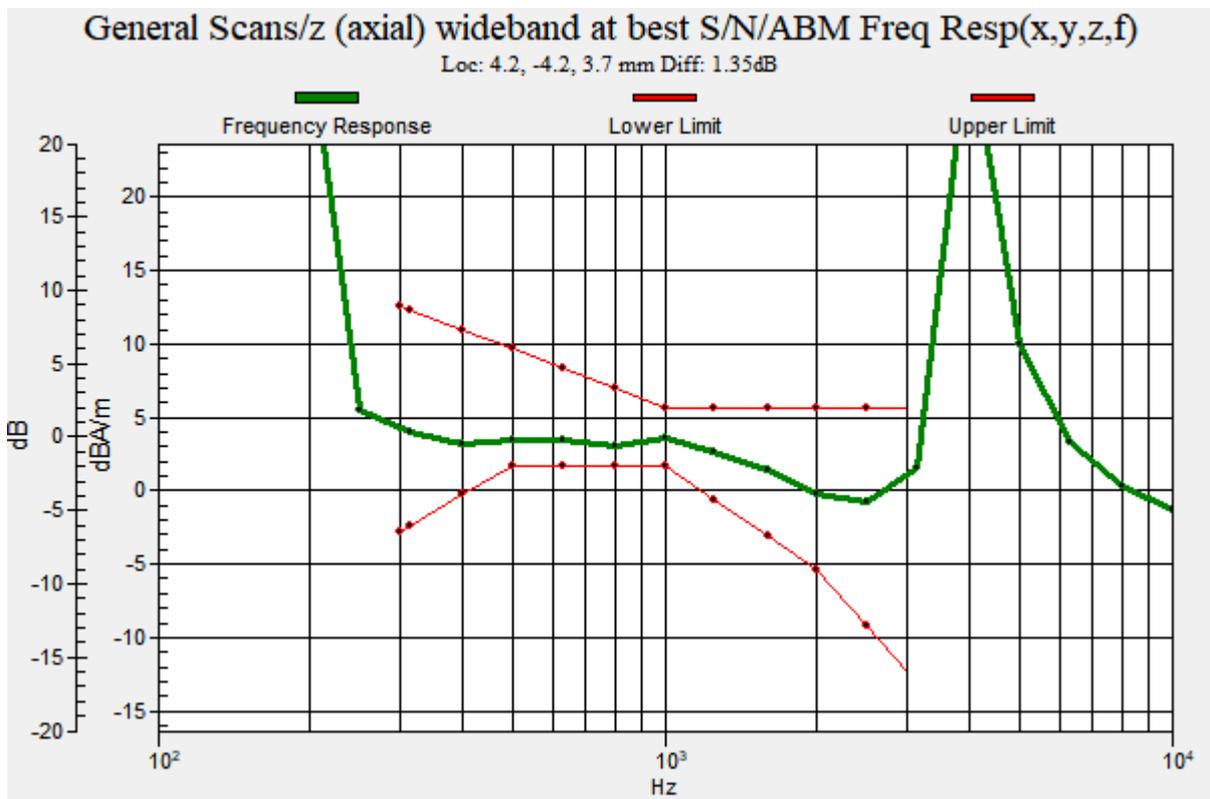
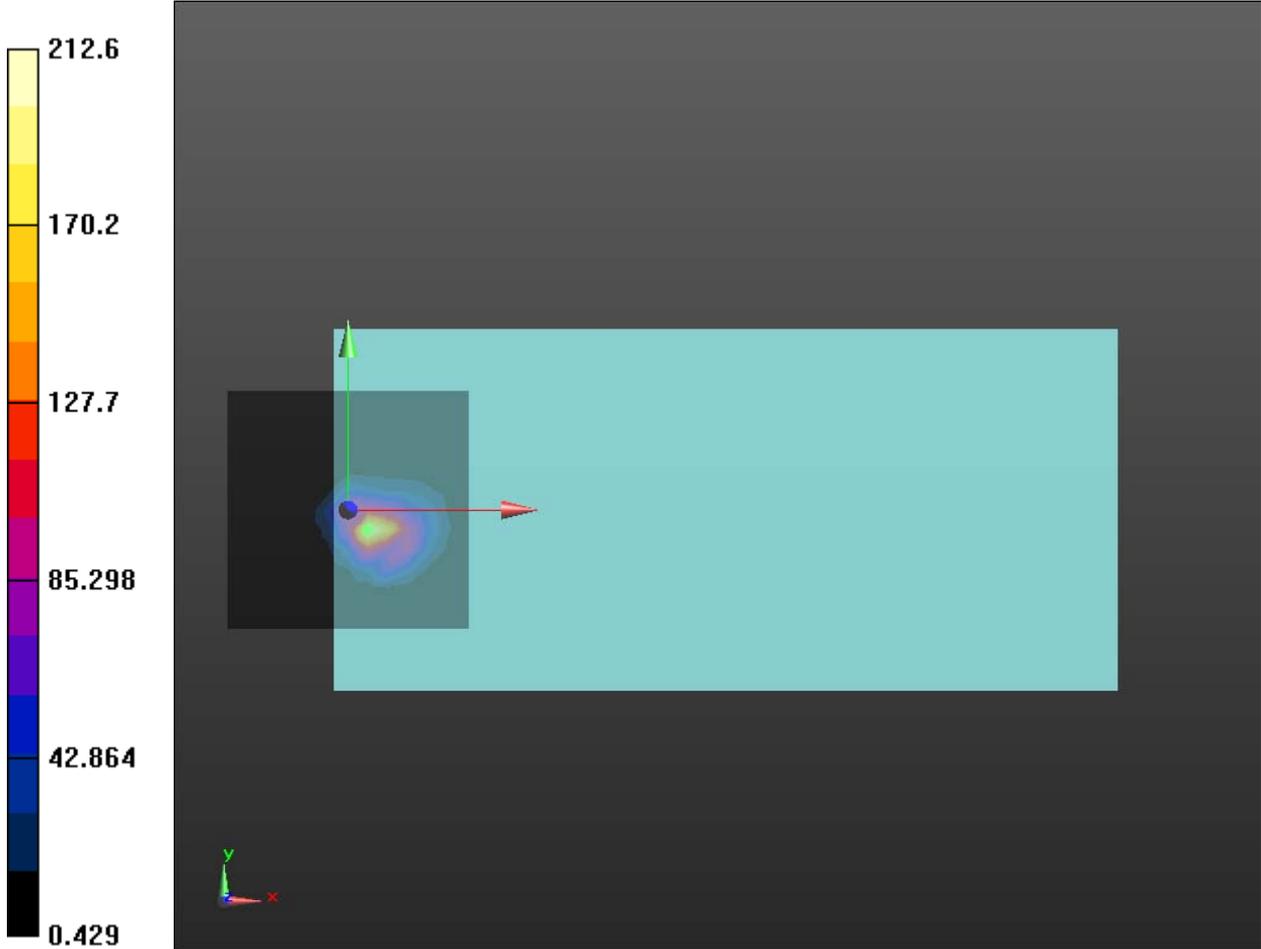
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.35 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 21 T-Coil WIFI 5G: 802.11a (U-NII-3) Y transversal**

Date: 9/3/2020

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

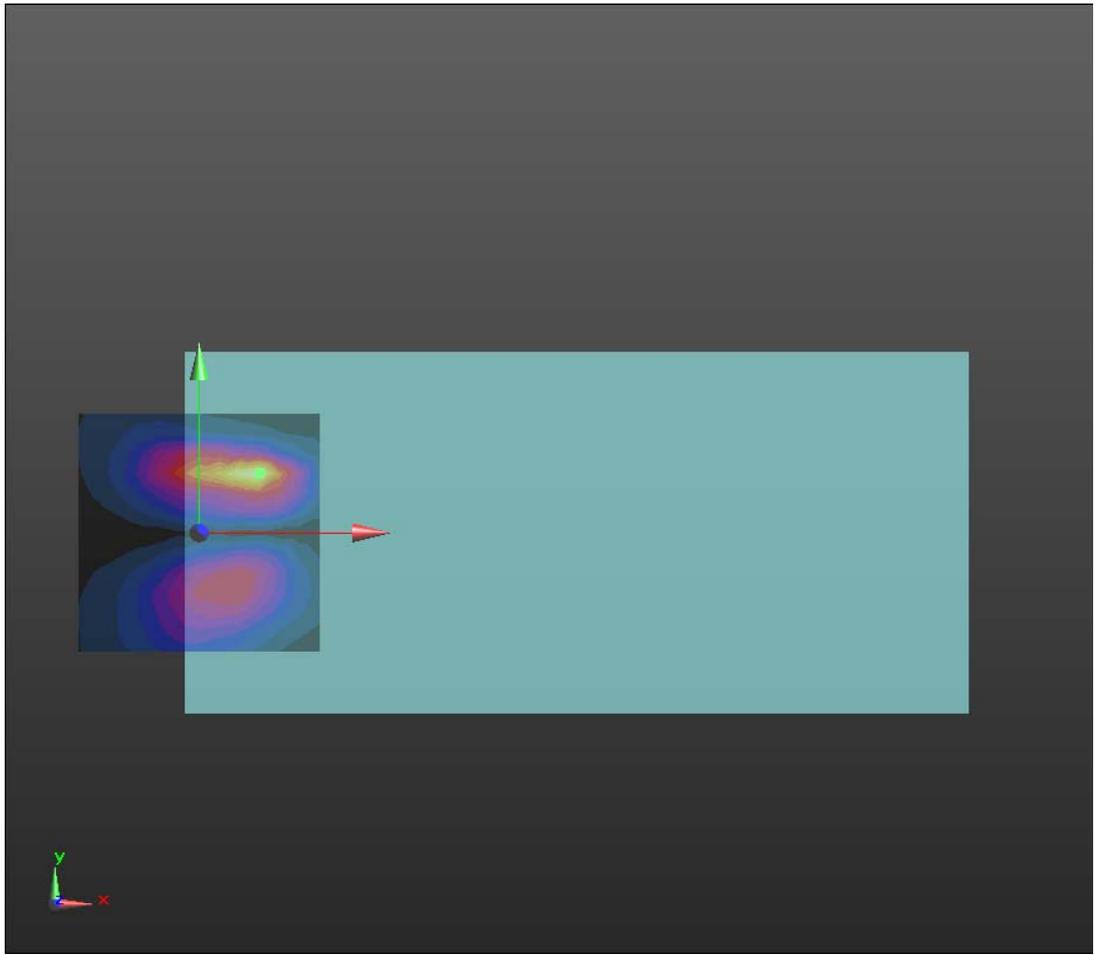
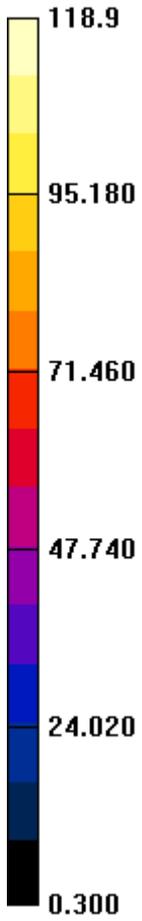
Cursor:

ABM1/ABM2 = 41.50 dB

ABM1 comp = -1.13 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 22 T-Coil WIFI 5G: 802.11a (U-NII-3) Z Axial**

Date: 9/3/2020

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 48.30 dB

ABM1 comp = 1.40 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

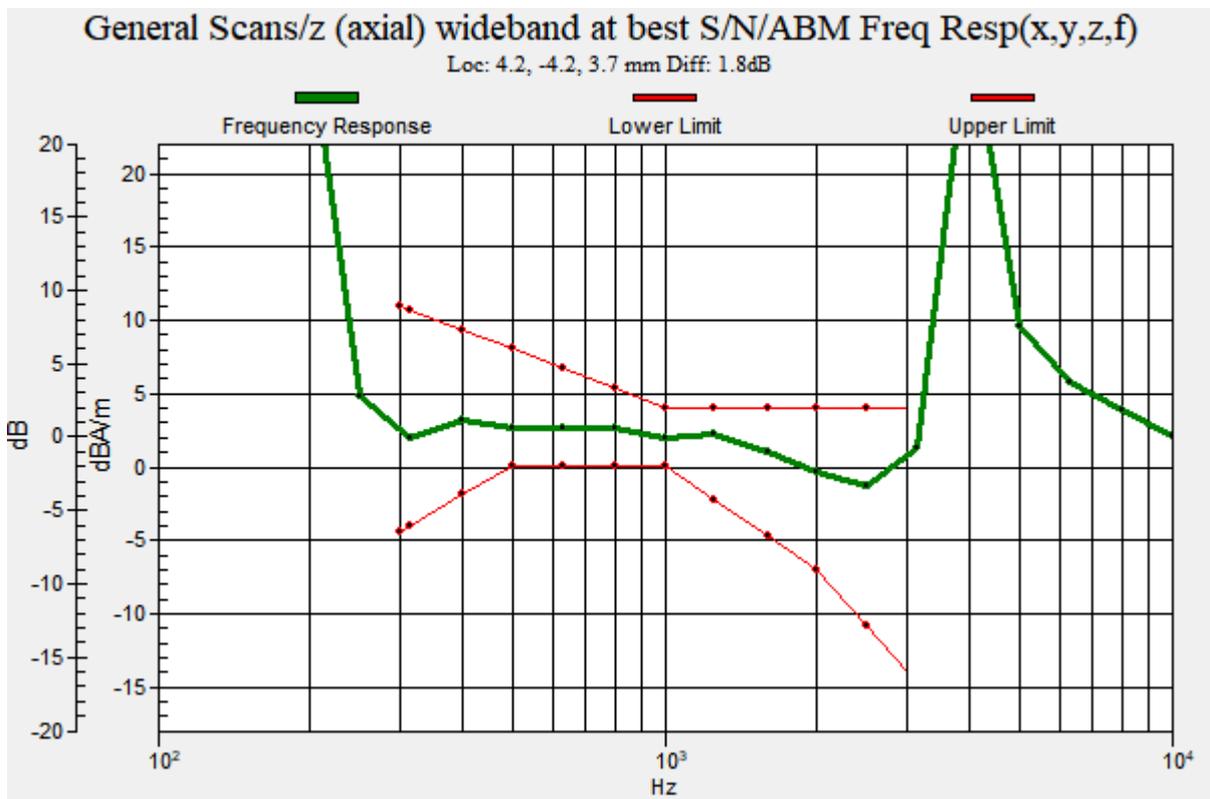
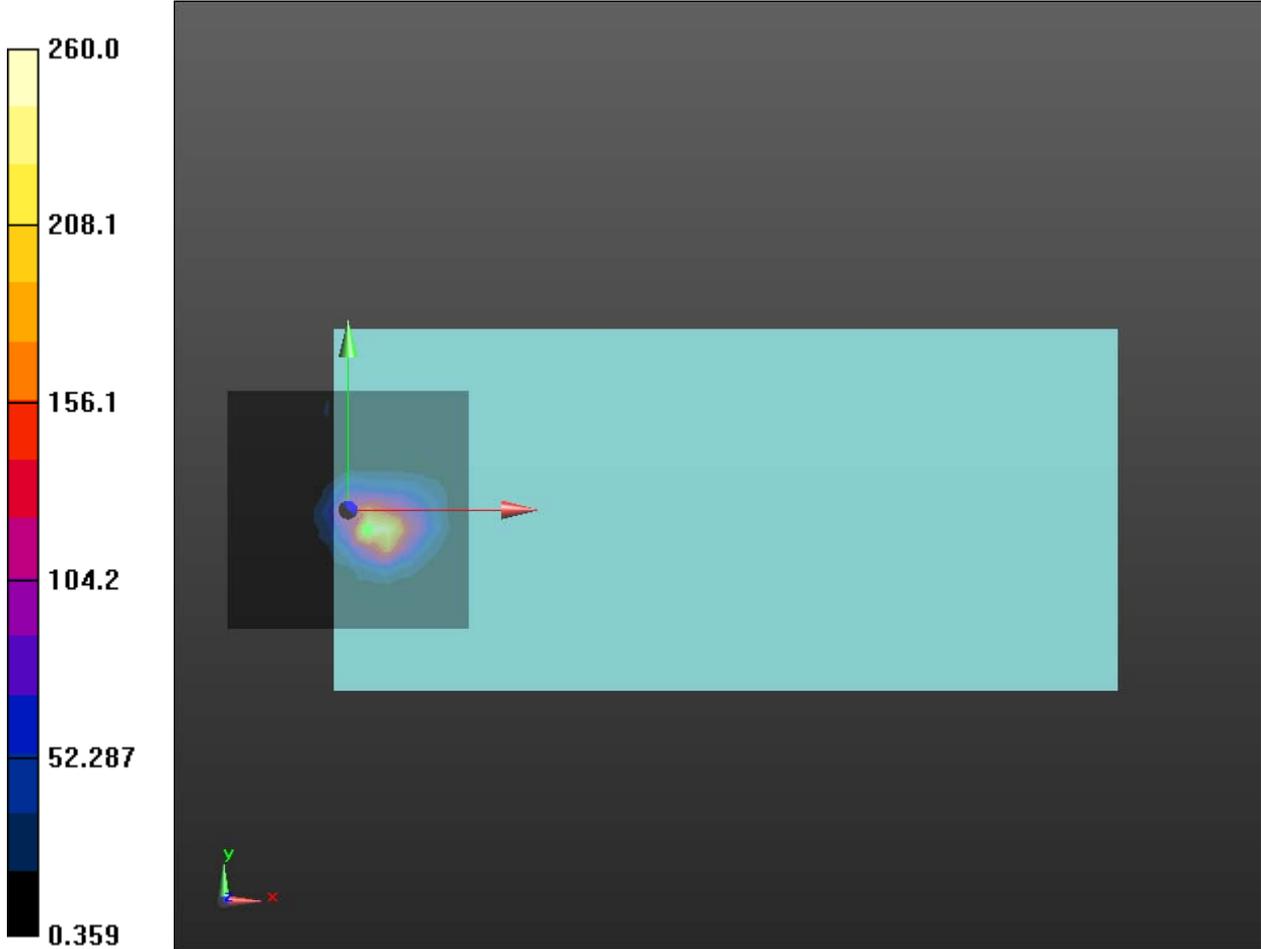
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.80 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**WB****Plot 23 T-Coil LTE Band 2 Y transversal**

Date: 9/3/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B2 HAC_TCoil_WD_Emission WB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

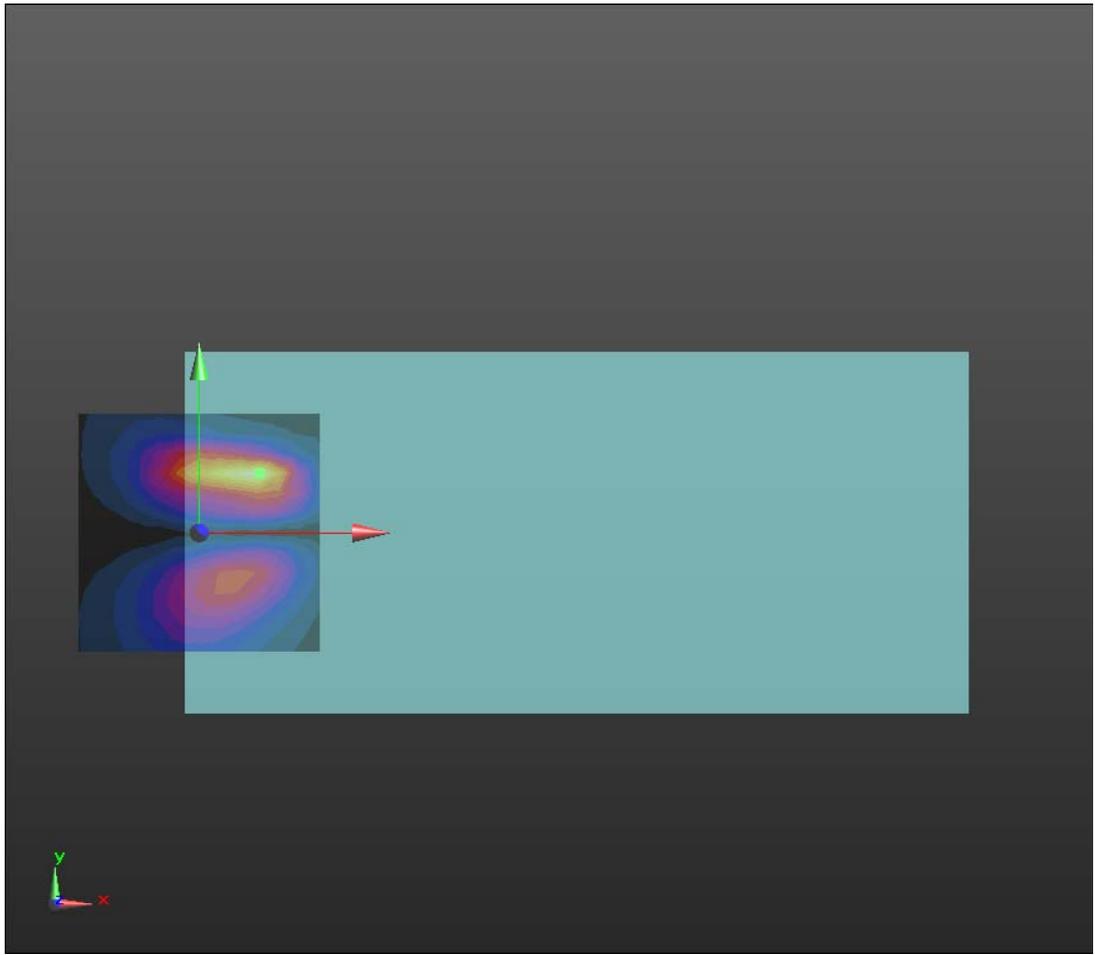
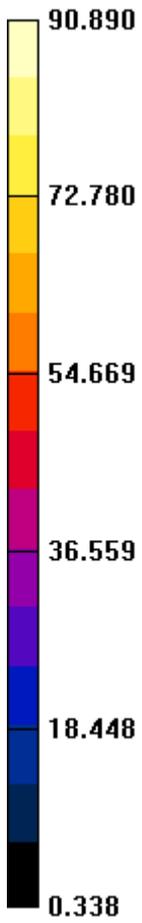
Cursor:

ABM1/ABM2 = 39.17 dB

ABM1 comp = -2.84 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 24 T-Coil LTE Band 2 Z Axial**

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B2 HAC_TCoil_WD_Emission WB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 47.67 dB

ABM1 comp = -1.37 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B2 HAC_TCoil_WD_Emission WB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

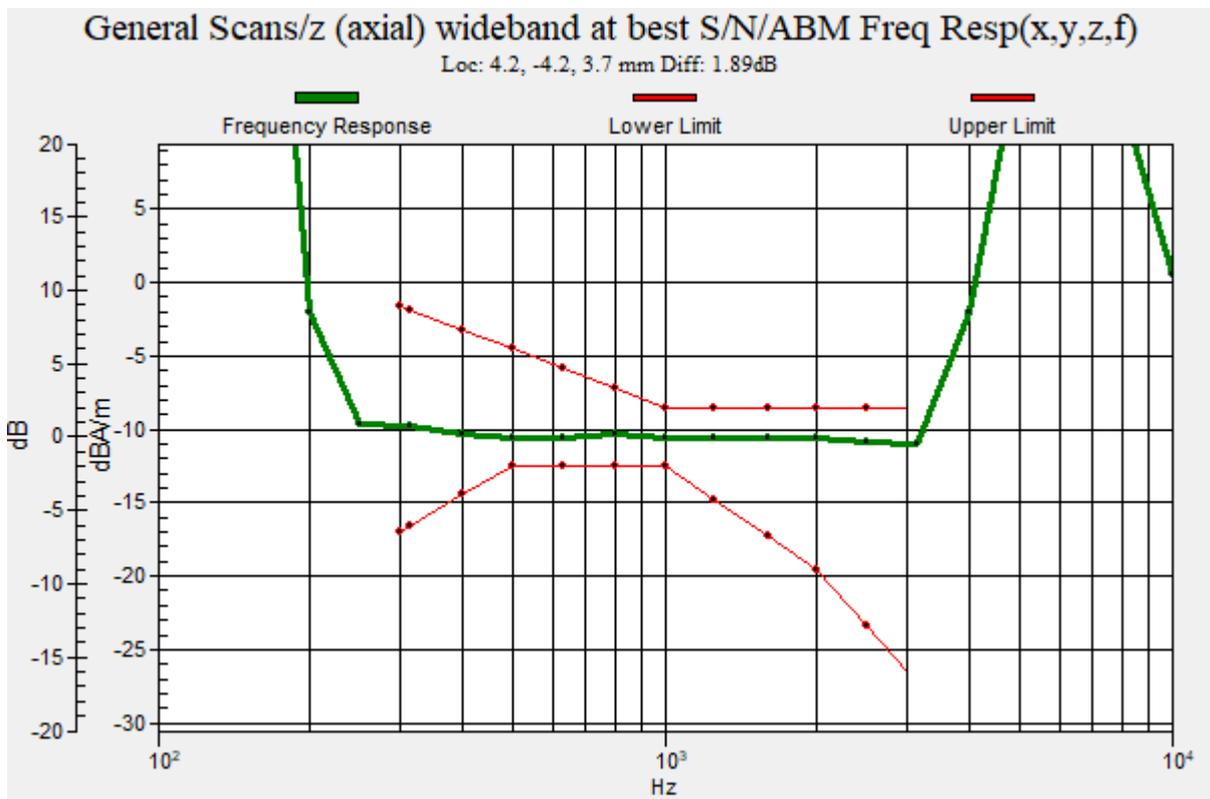
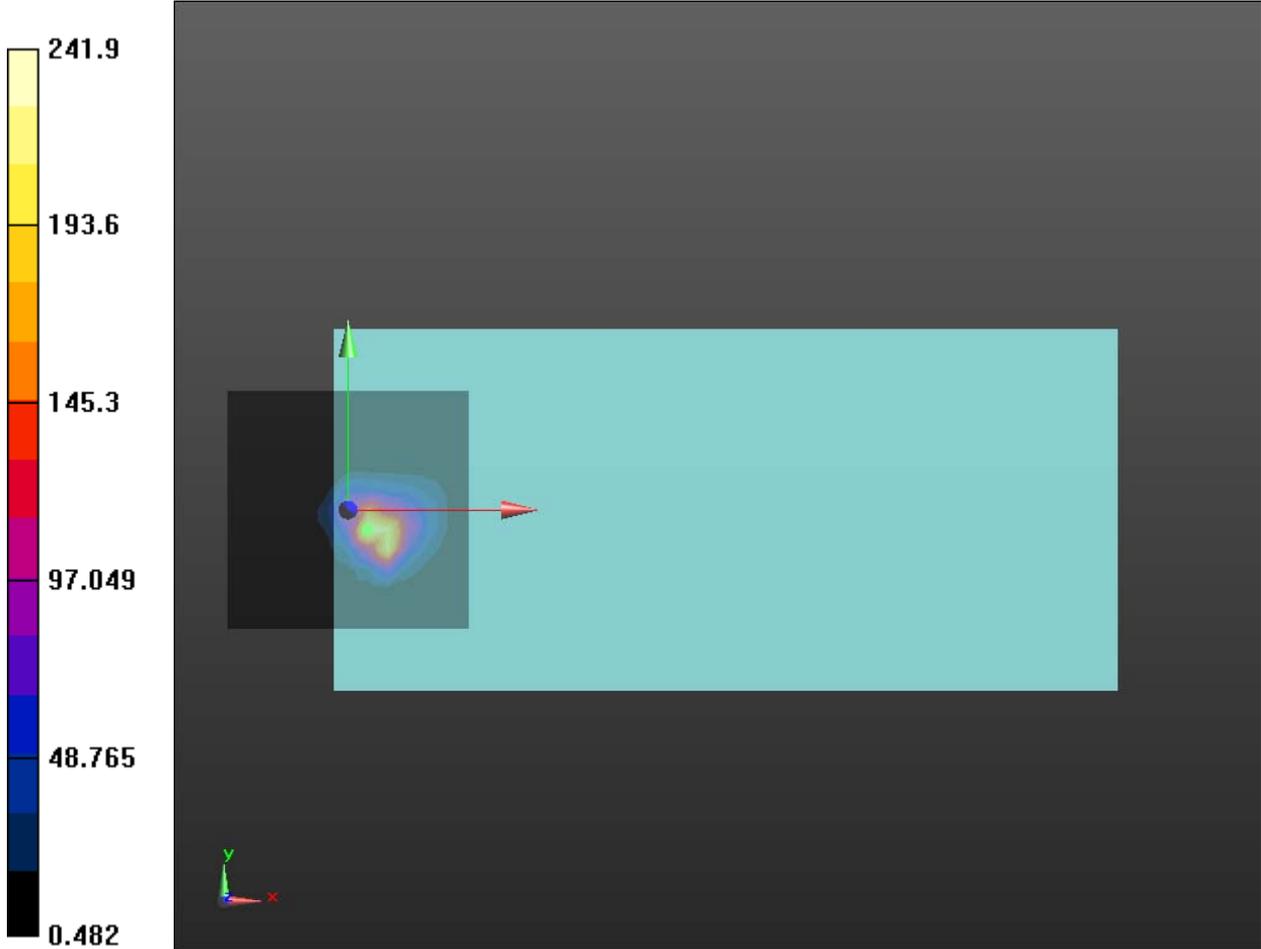
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.89 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 25 T-Coil LTE Band 4 Y transversal**

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B4 HAC_TCoil_WD_Emission WB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

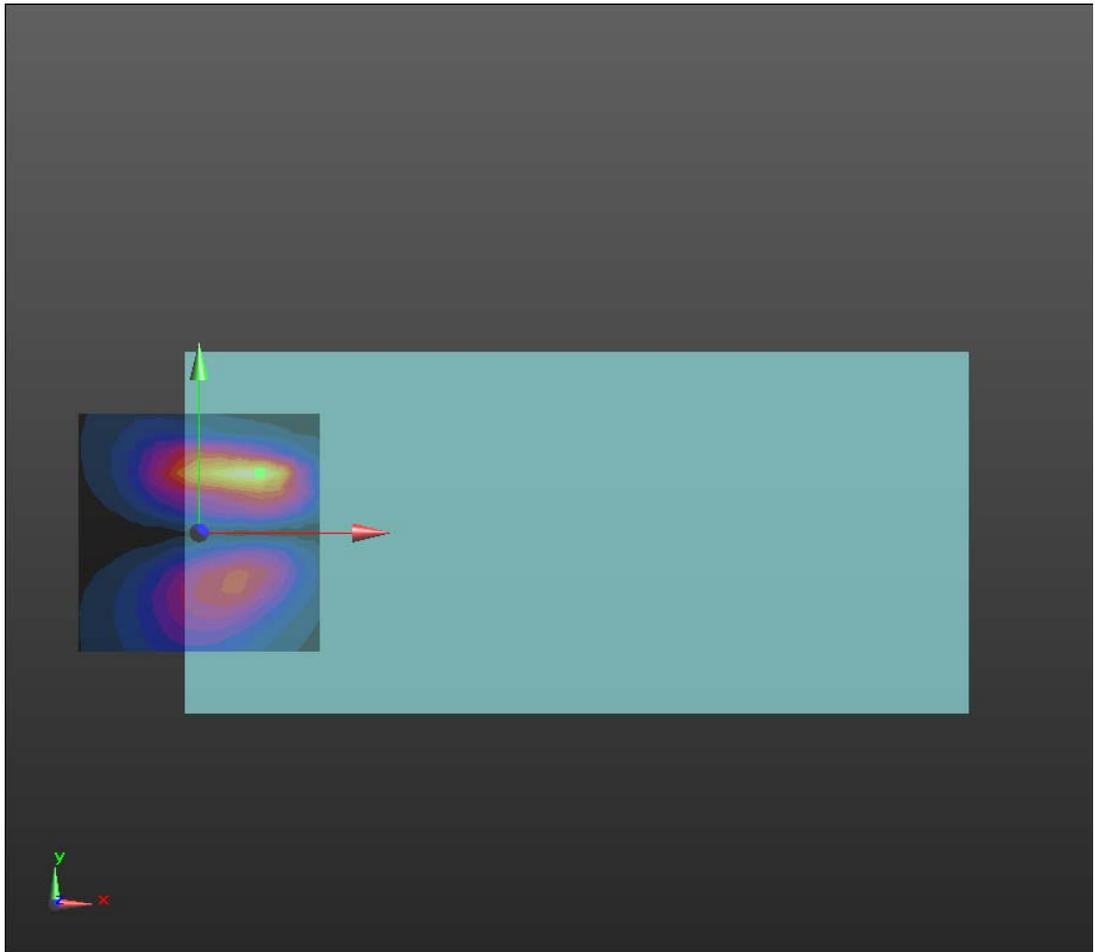
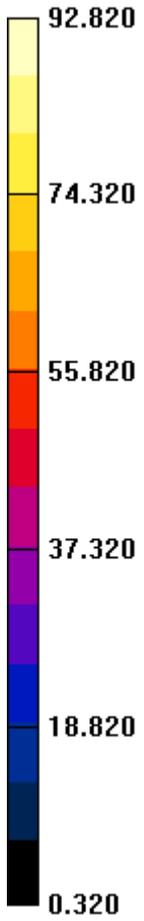
Cursor:

ABM1/ABM2 = 39.35 dB

ABM1 comp = -2.83 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 26 T-Coil LTE Band 4 Z Axial**

Date: 8/22/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B4 HAC_TCoil_WD_Emission WB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 49.18 dB

ABM1 comp = -0.95 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B4 HAC_TCoil_WD_Emission WB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

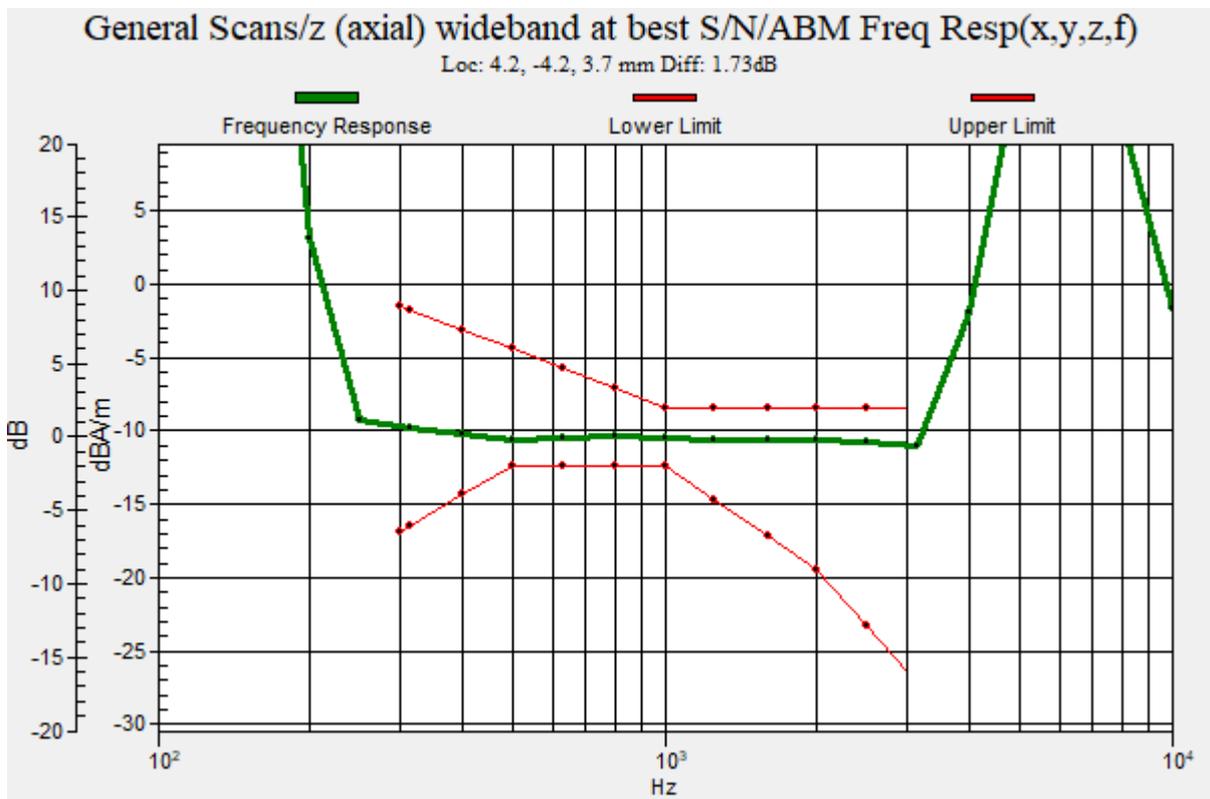
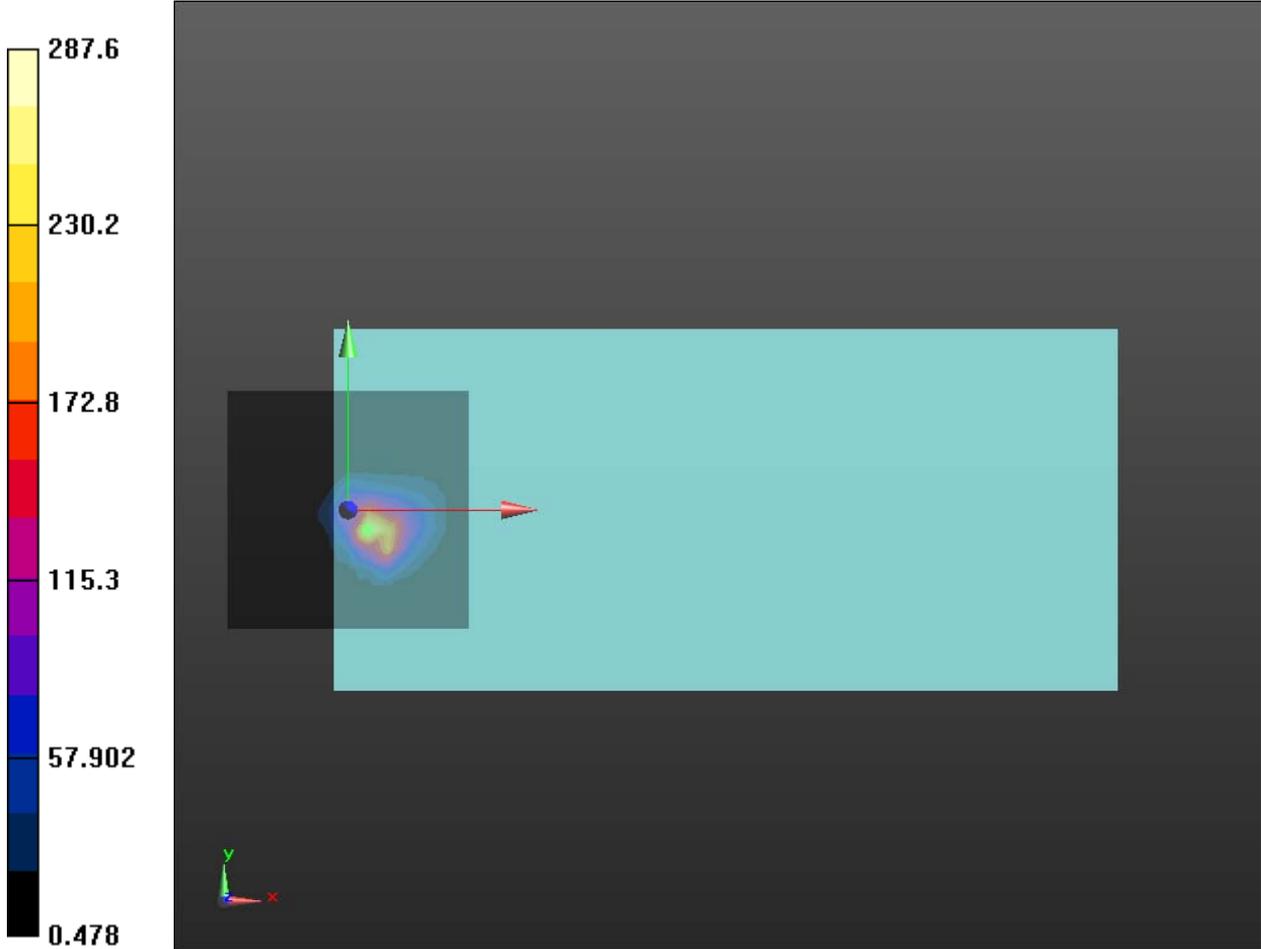
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.73 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 27 T-Coil LTE Band 5 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B5 HAC_TCoil_WD_Emission WB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

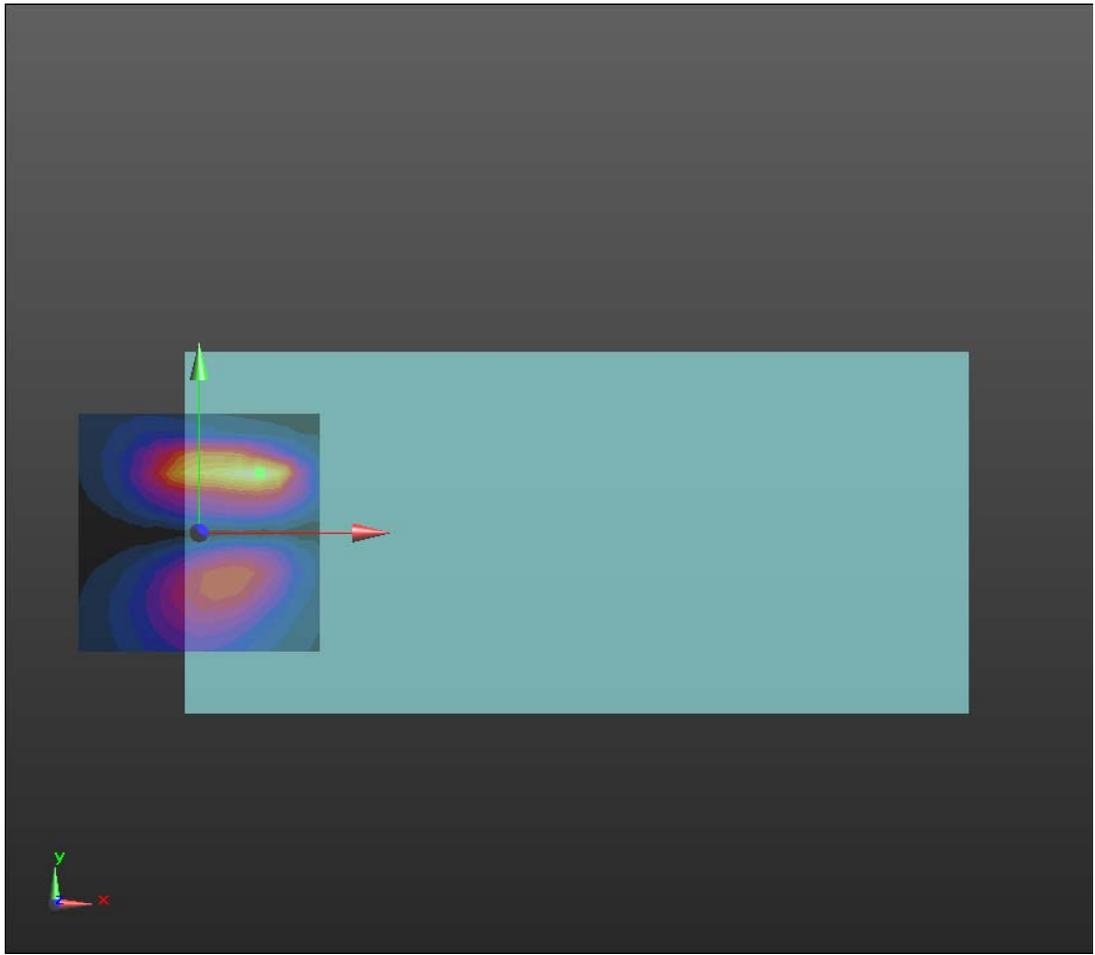
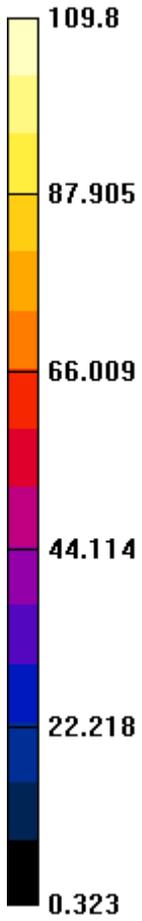
Cursor:

ABM1/ABM2 = 40.81 dB

ABM1 comp = -1.10 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 28 T-Coil LTE Band 5 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B5 HAC_TCoil_WD_Emission WB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.22 dB

ABM1 comp = 1.48 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B5 HAC_TCoil_WD_Emission WB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

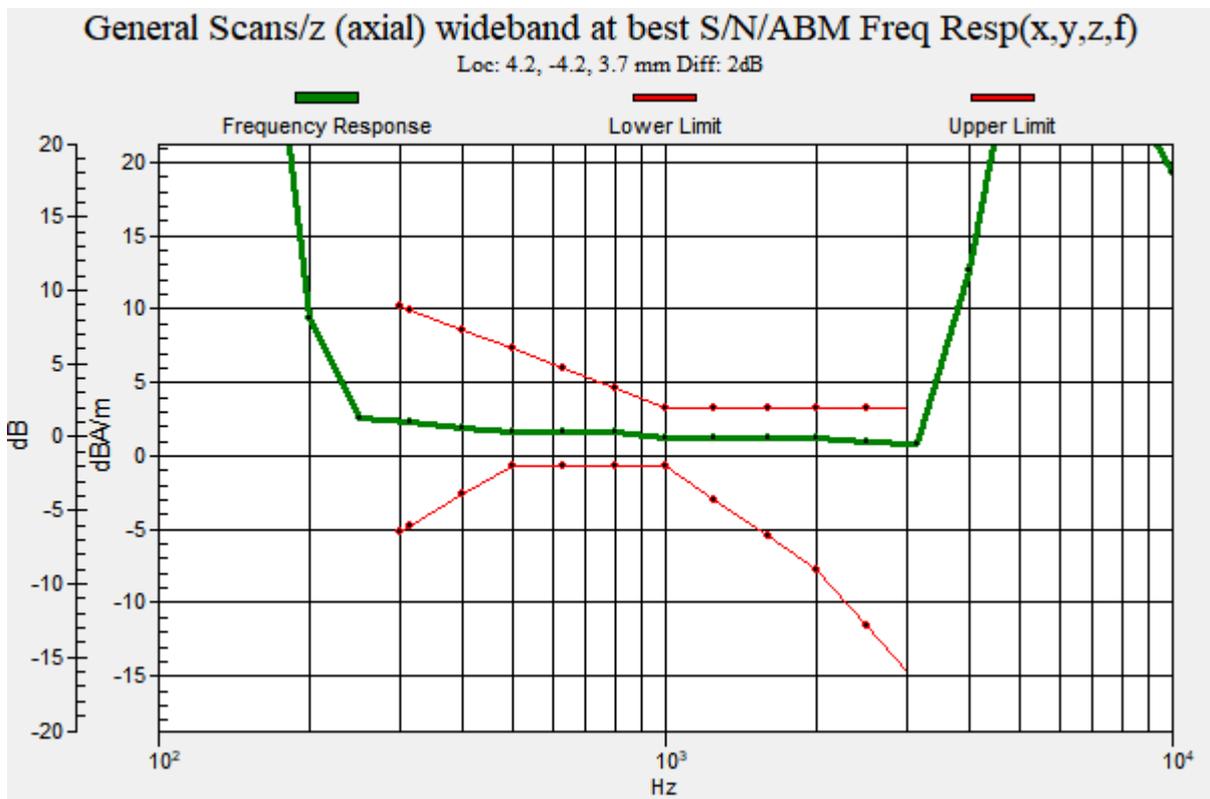
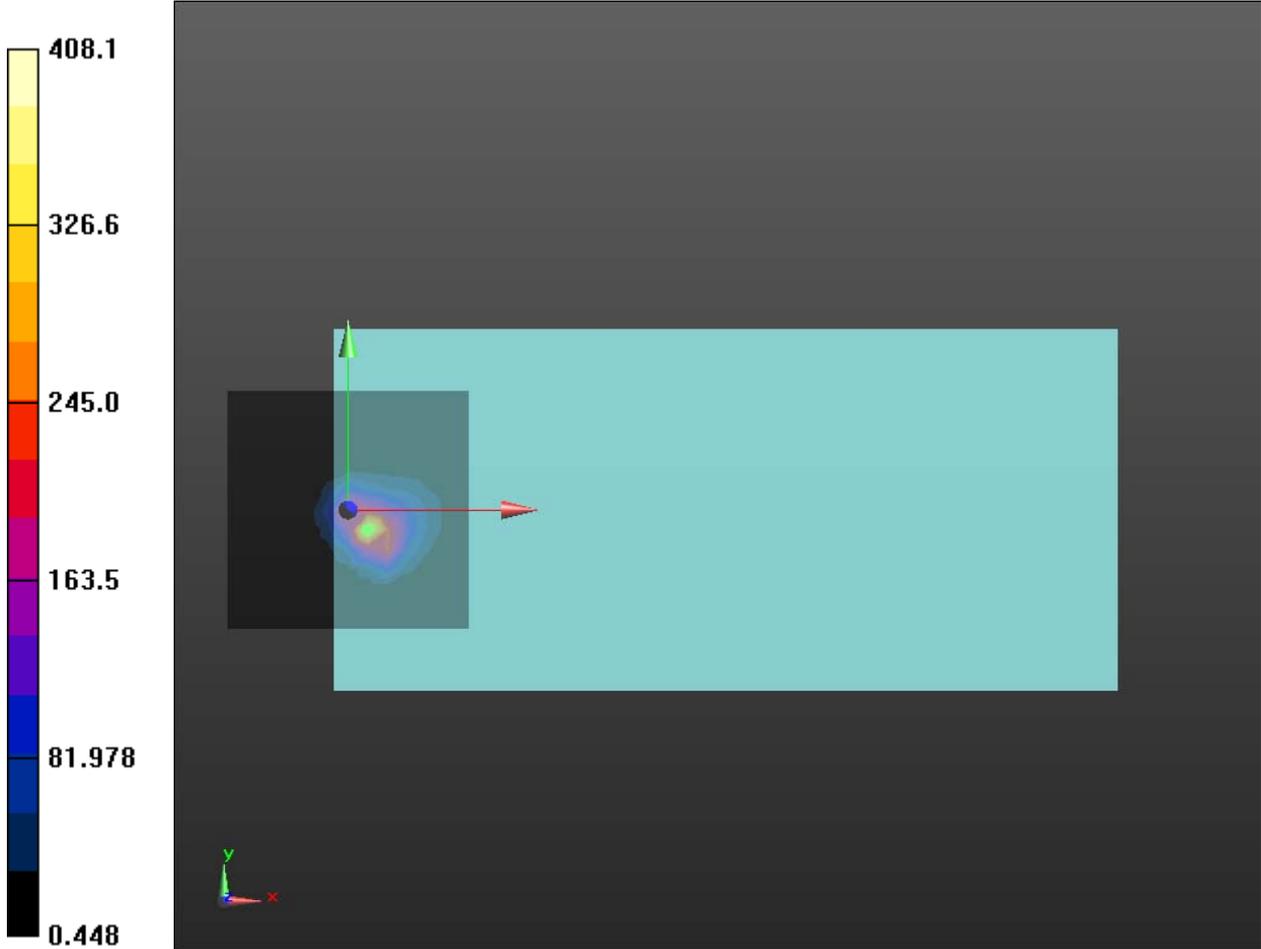
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 2.00 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 29 T-Coil LTE Band 12 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B12 HAC_TCoil_WD_Emission WB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

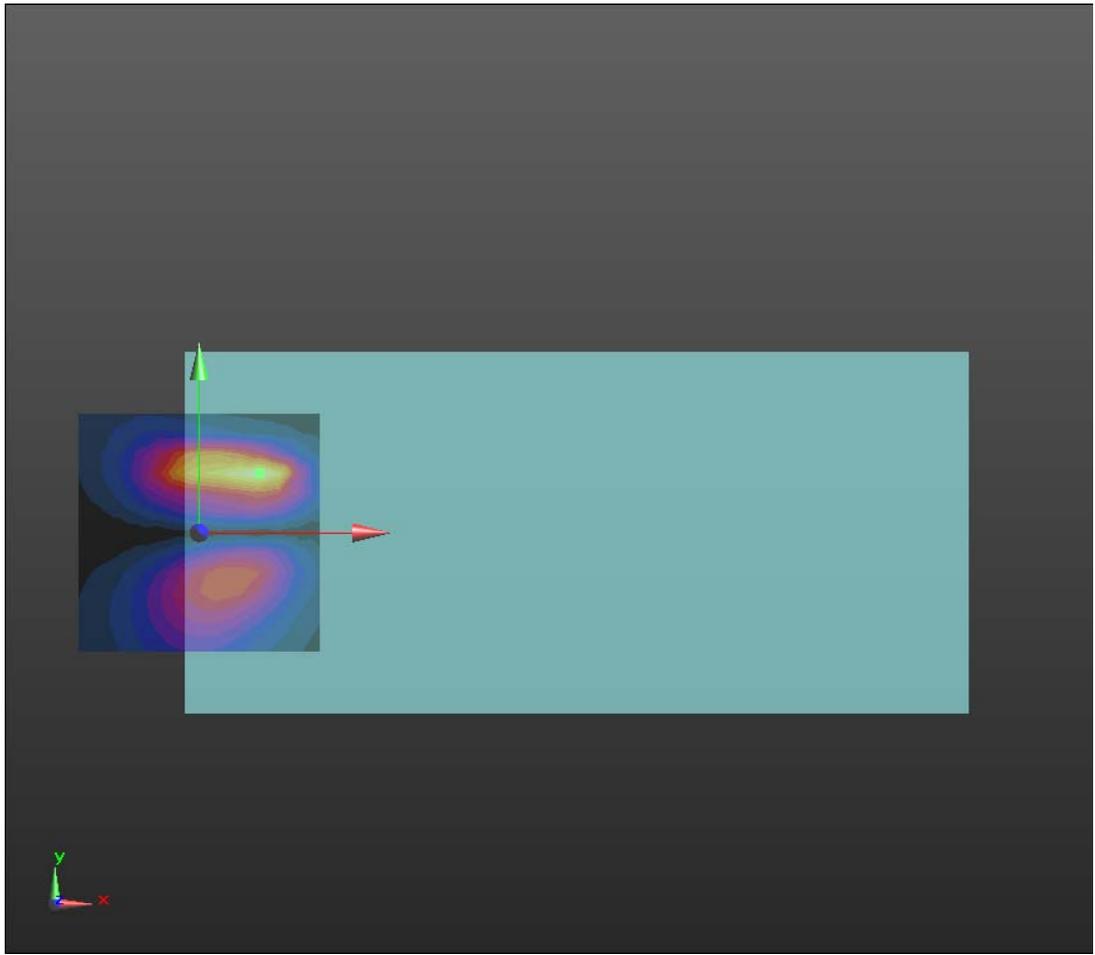
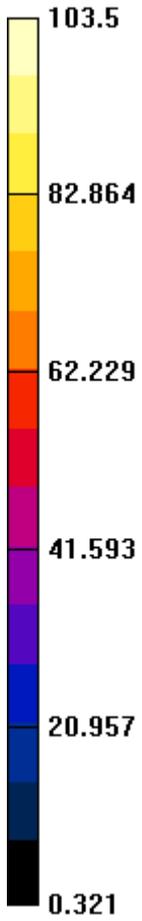
Cursor:

ABM1/ABM2 = 40.30 dB

ABM1 comp = -1.47 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 30 T-Coil LTE Band 12 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B12 HAC_TCoil_WD_Emission WB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 51.73 dB

ABM1 comp = 1.12 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B12 HAC_TCoil_WD_Emission WB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

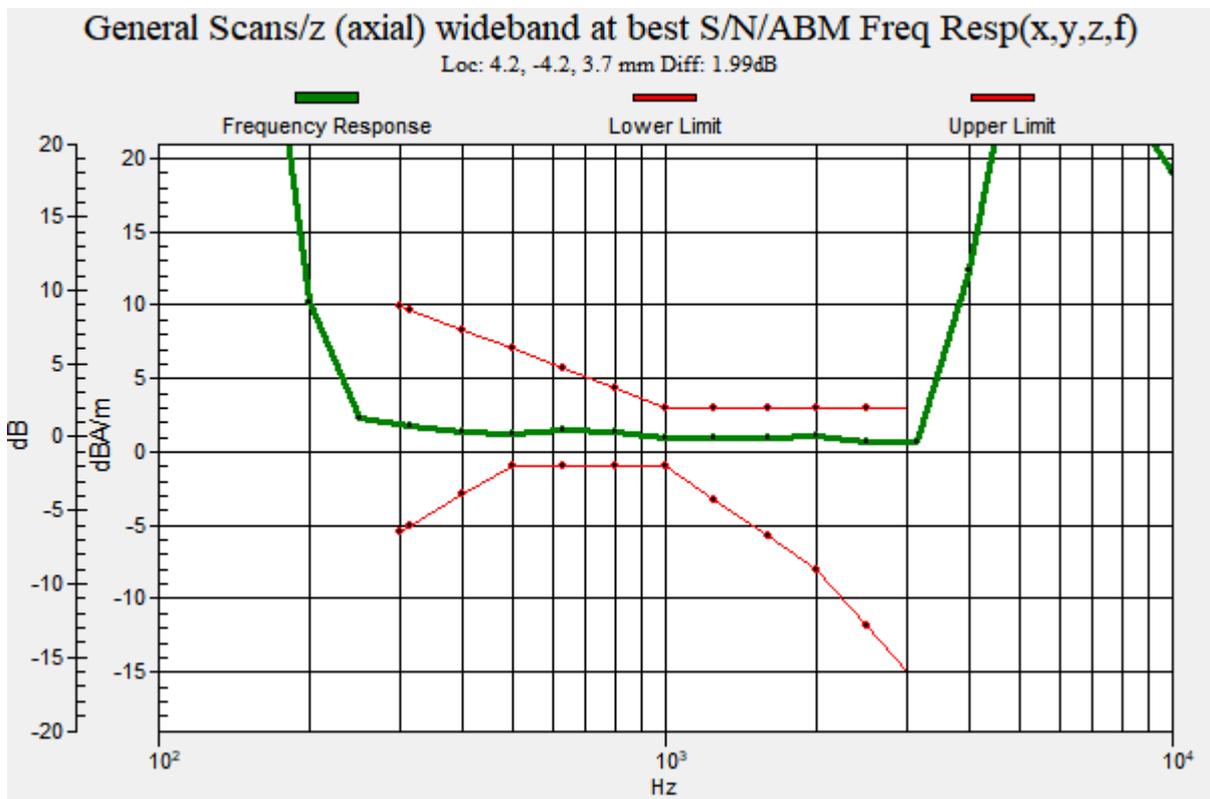
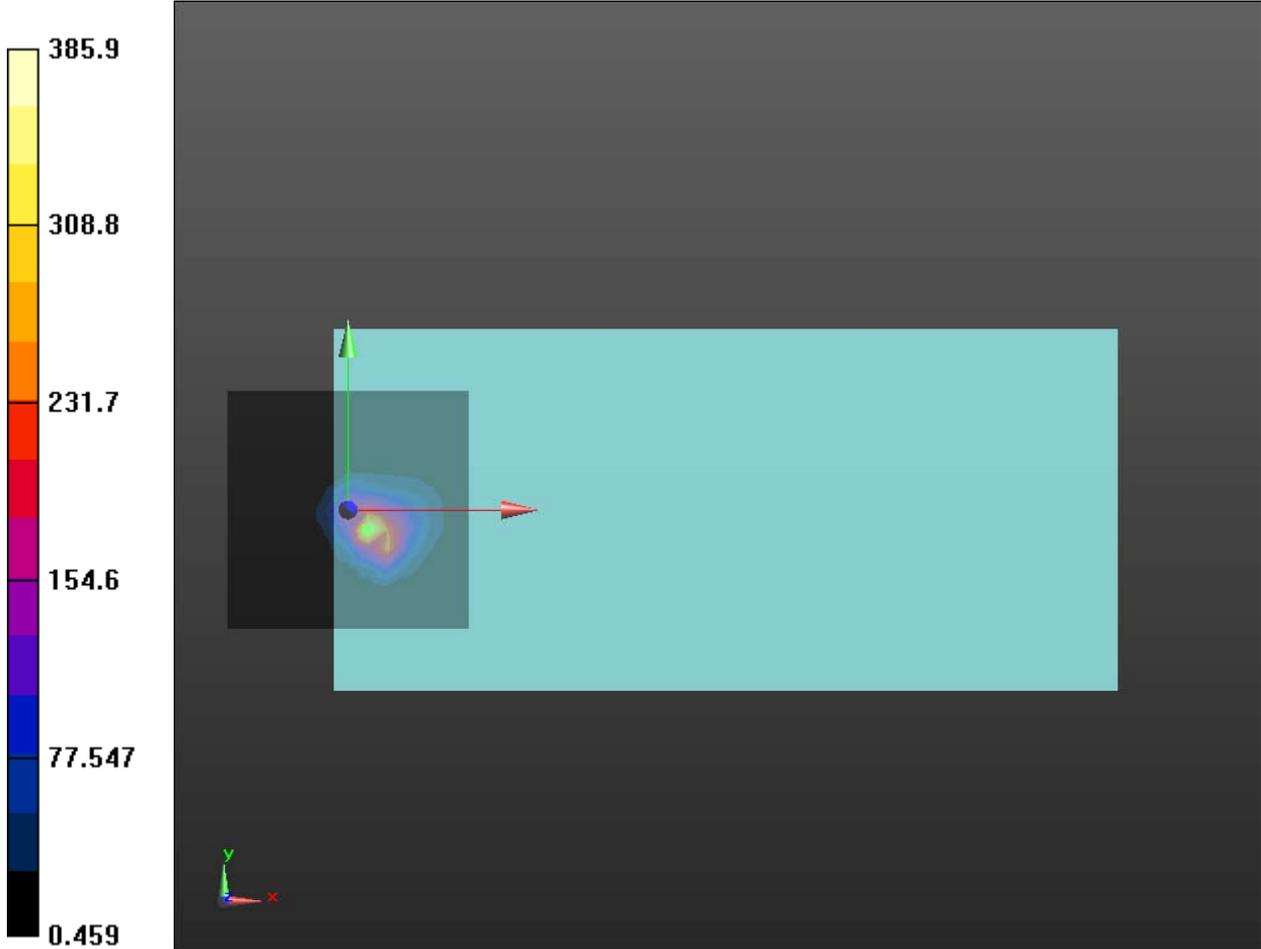
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.99 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 31 T-Coil LTE Band 13 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission WB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

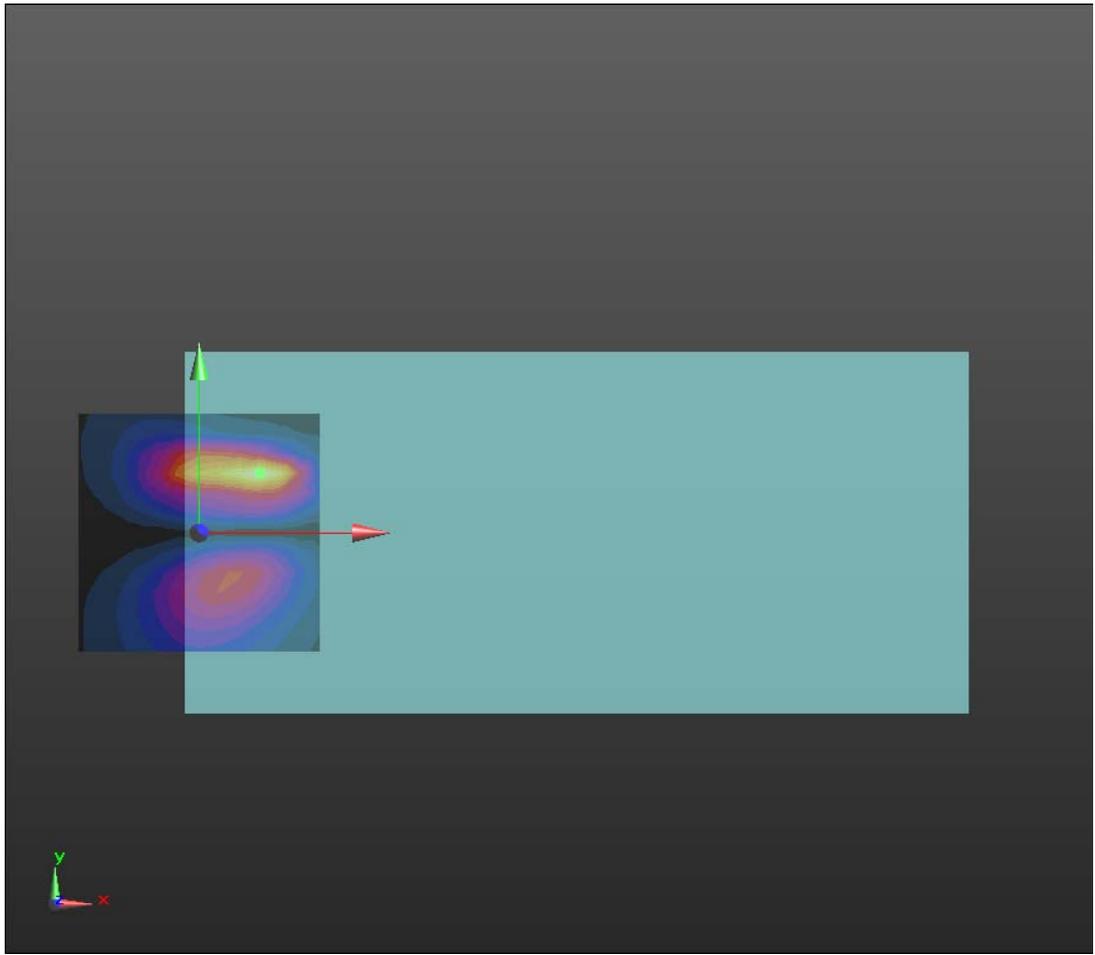
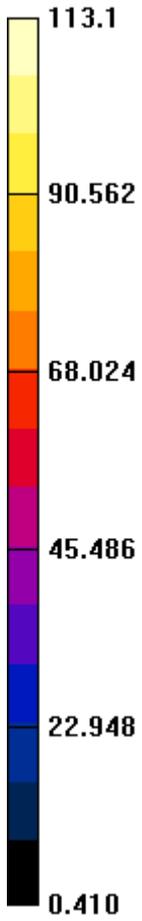
Cursor:

ABM1/ABM2 = 41.07 dB

ABM1 comp = -1.64 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 32 T-Coil LTE Band 13 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission WB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.69 dB

ABM1 comp = 0.52 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B13 HAC_TCoil_WD_Emission WB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

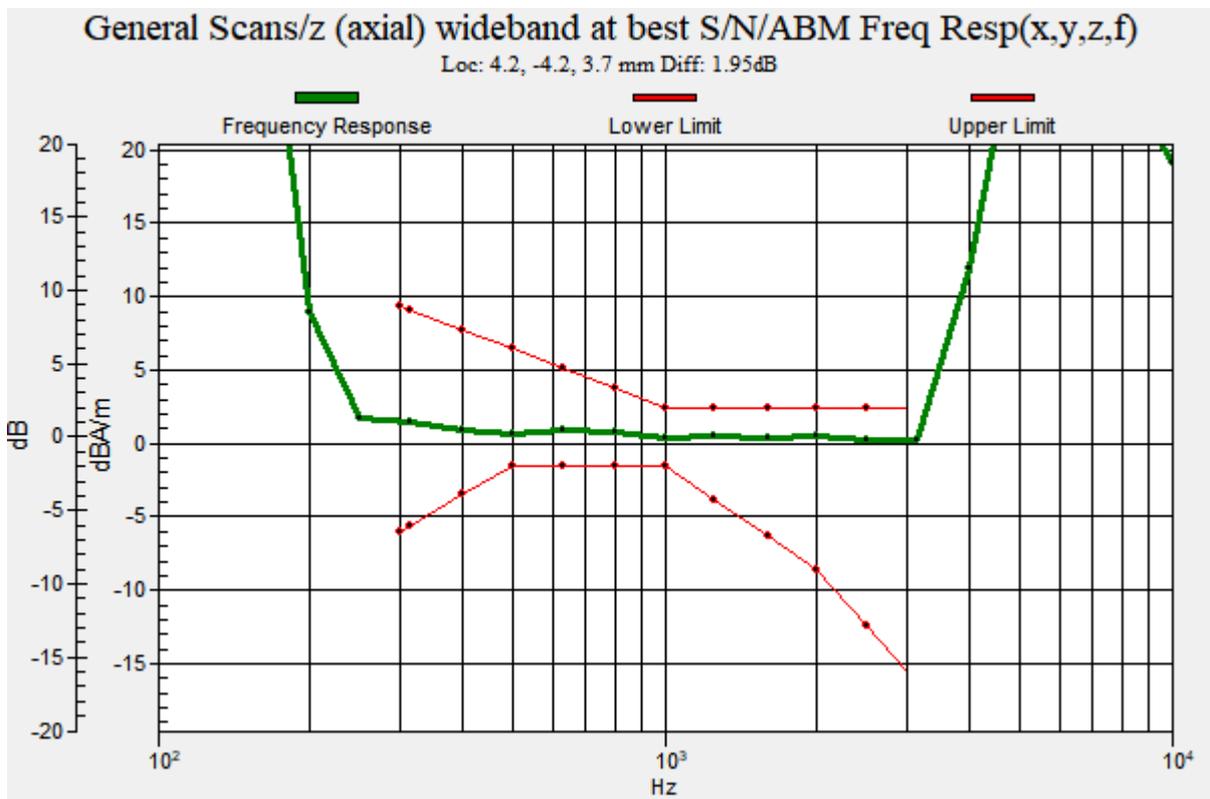
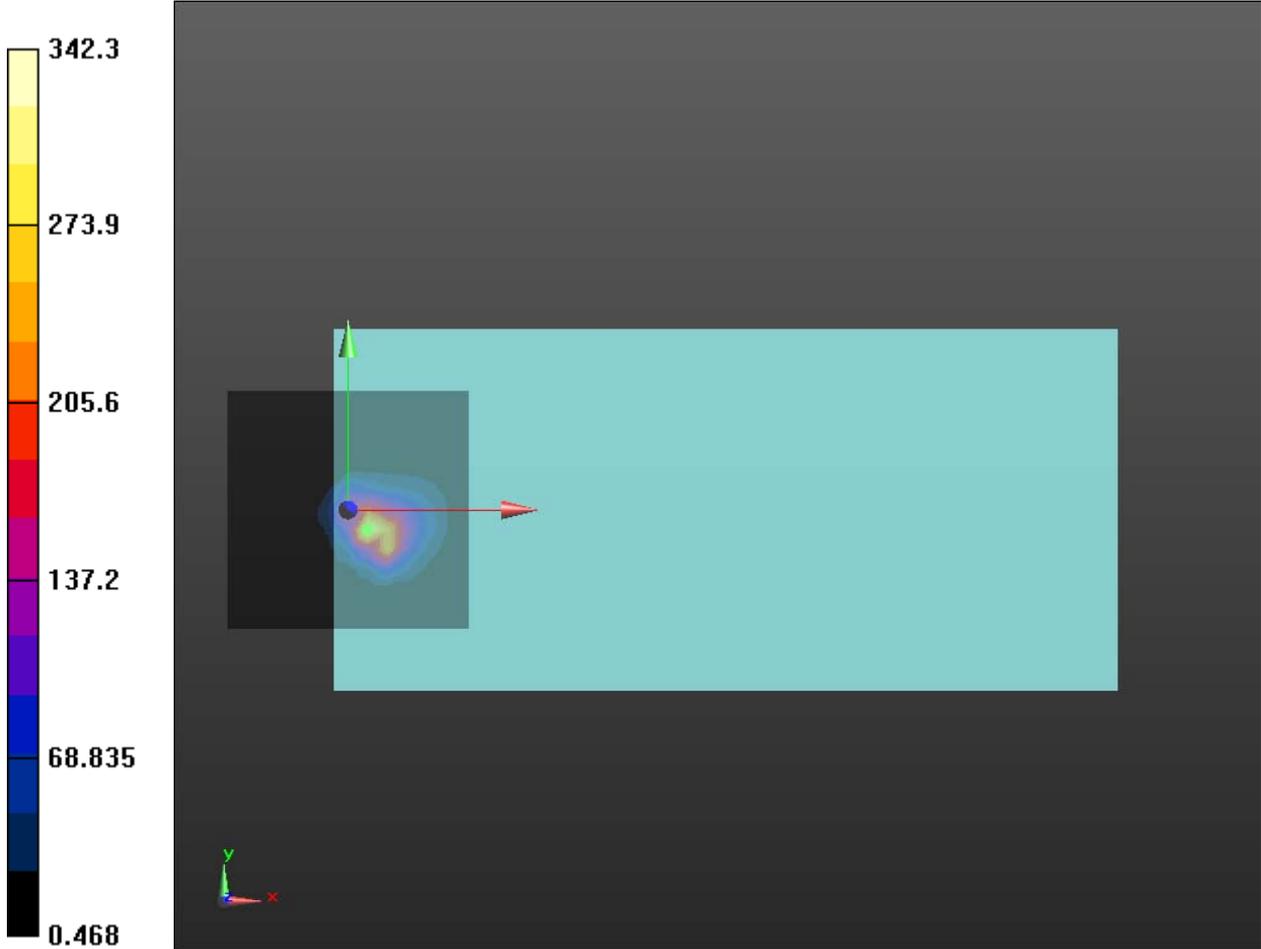
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.95 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 33 T-Coil LTE Band 66 Y transversal**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission WB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

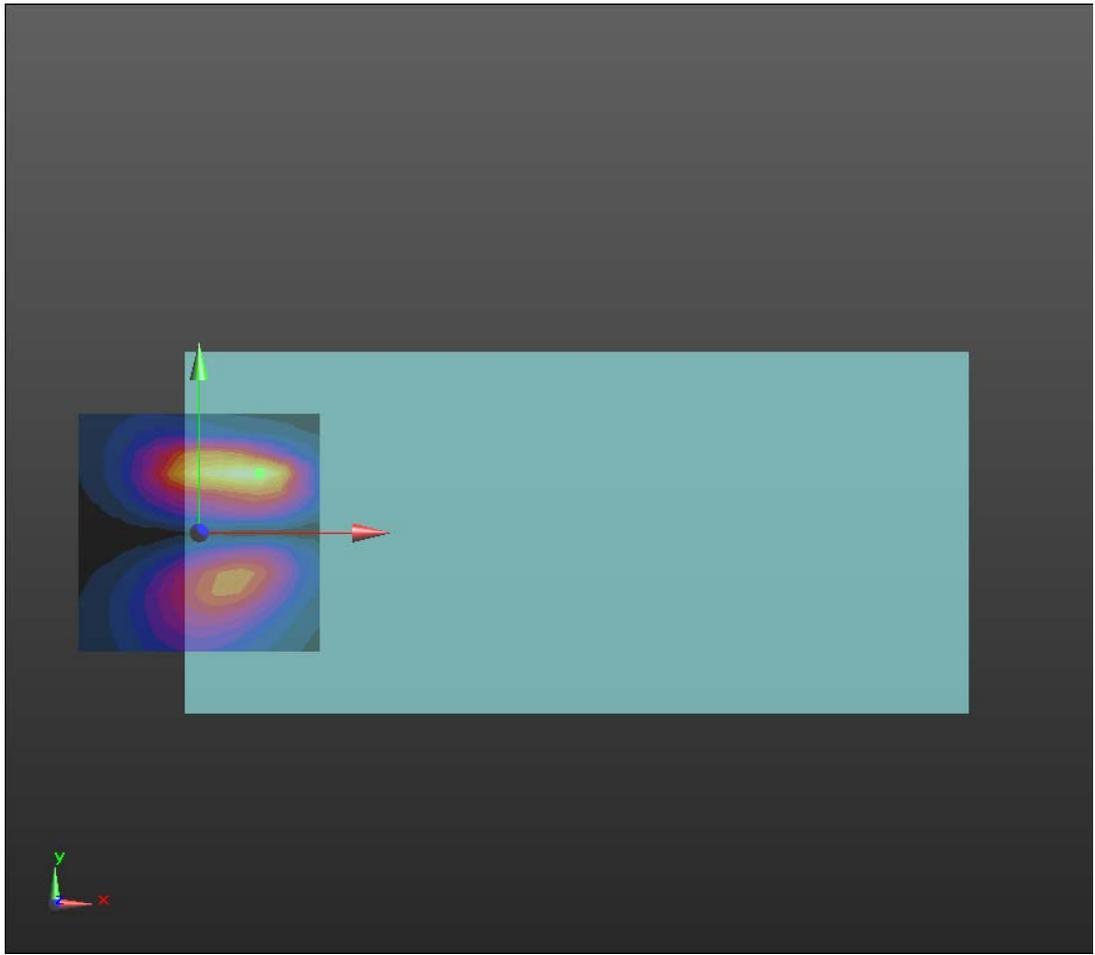
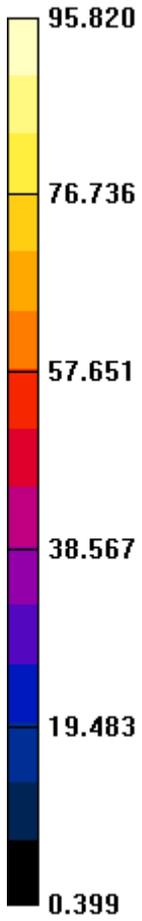
Cursor:

ABM1/ABM2 = 39.63 dB

ABM1 comp = -1.60 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 34 T-Coil LTE Band 66 Z Axial**

Date: 8/29/2020

Communication System: UID 0, LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_TCoil_WD_Emission WB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 24.72

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.71 dB

ABM1 comp = 0.65 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B13 HAC_TCoil_WD_Emission WB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 50.70

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

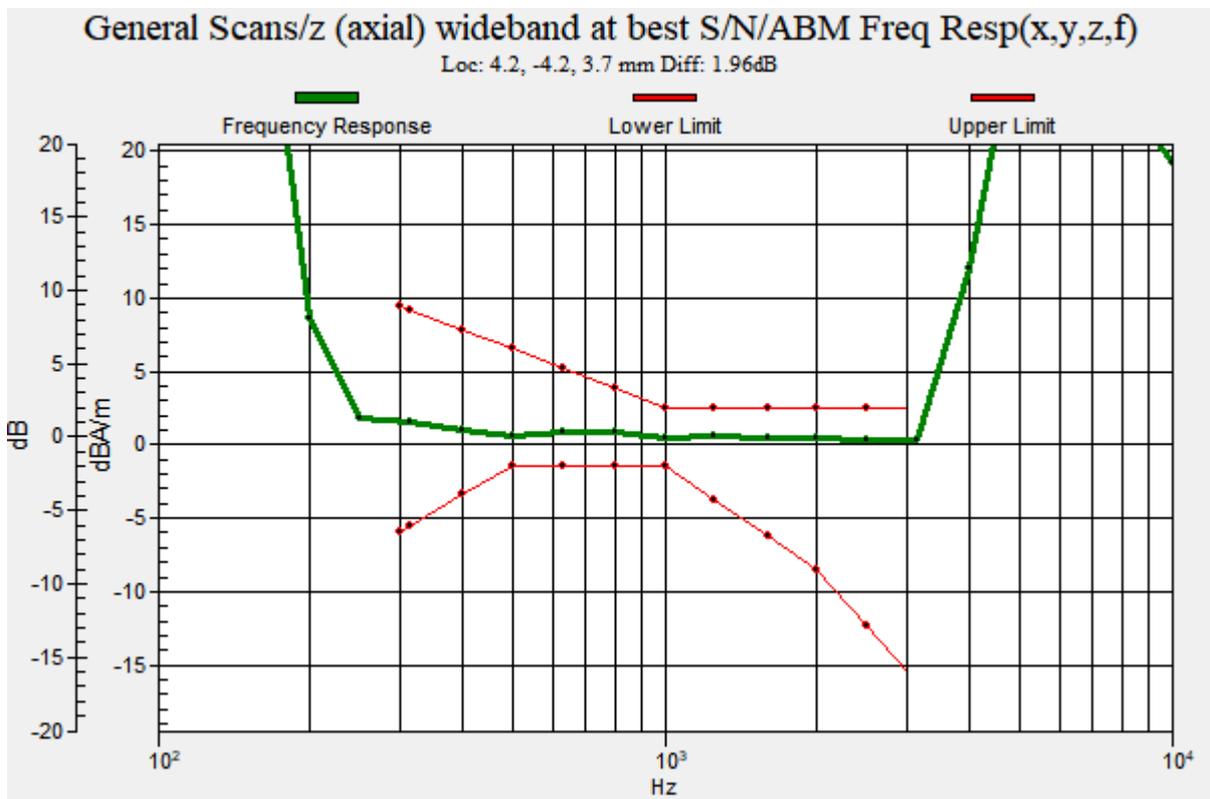
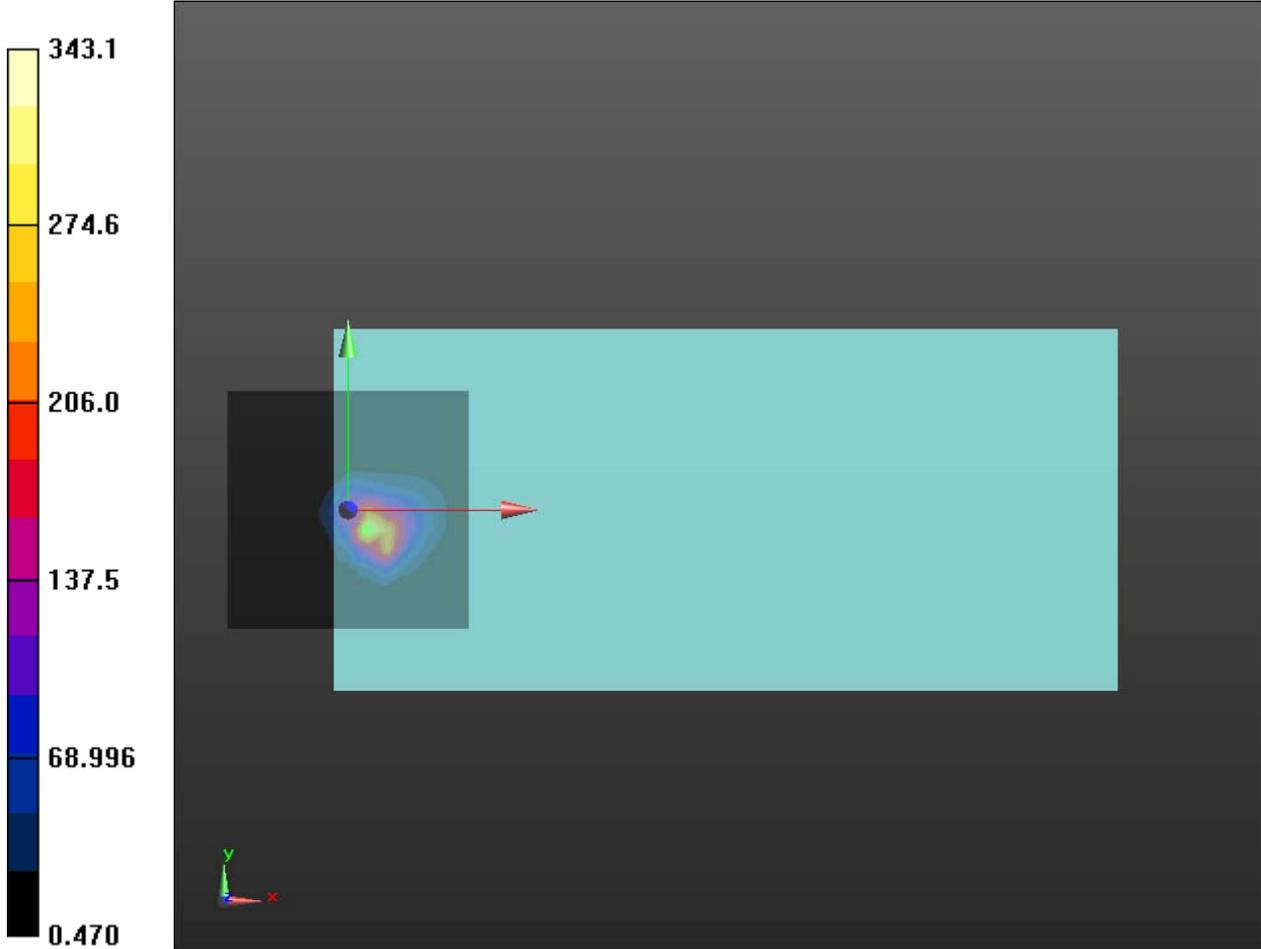
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.96 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 35 T-Coil WIFI 2.4G: 802.11b Y transversal**

Date: 9/3/2020

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11b HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

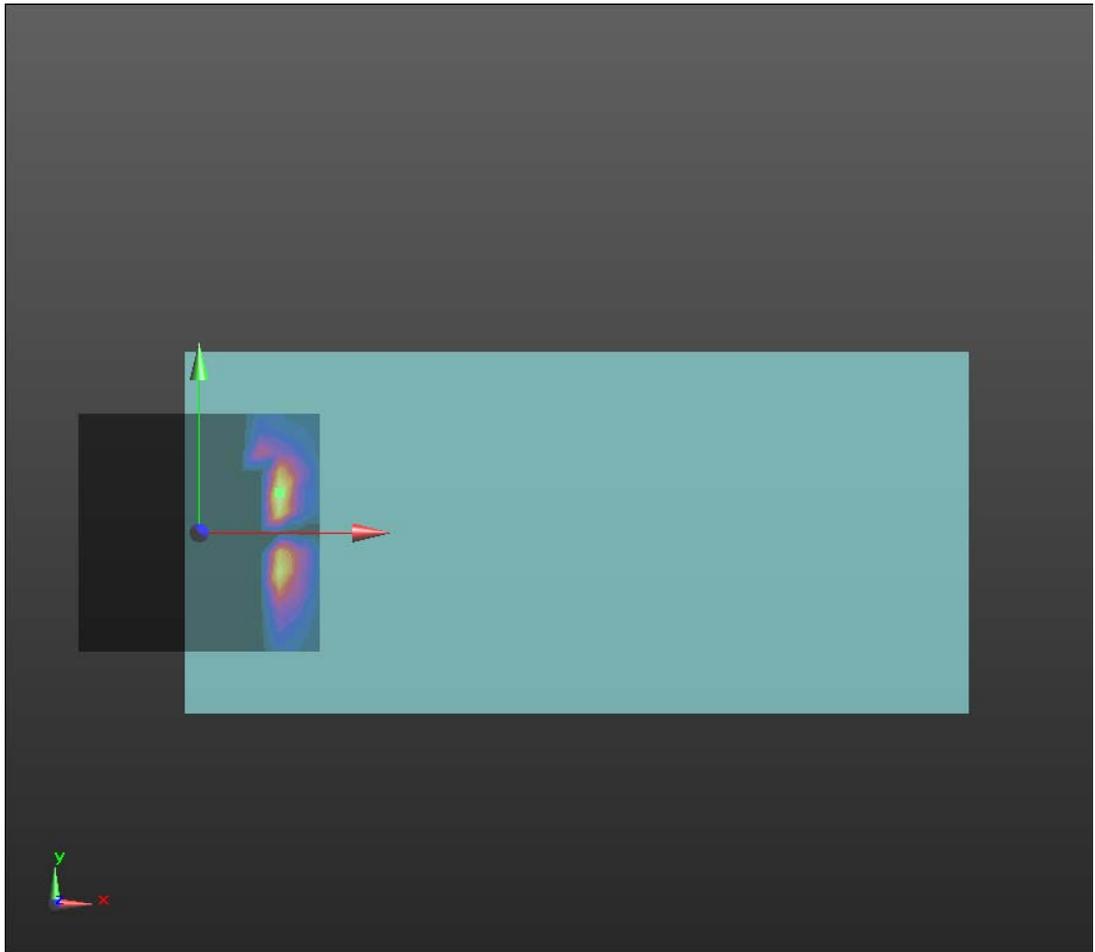
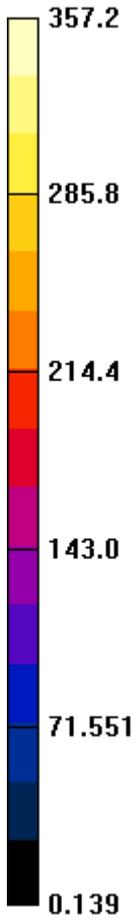
Cursor:

ABM1/ABM2 = 51.06 dB

ABM1 comp = 2.87 dBA/m

BWC Factor = 0.17 dB

Location: 16.7, 8.3, 3.7 mm



**Plot 36 T-Coil WIFI 2.4G: 802.11b Z Axial**

Date: 9/3/2020

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11b HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 39.81 dB

ABM1 comp = 4.31 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, 0, 3.7 mm

802.11b HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

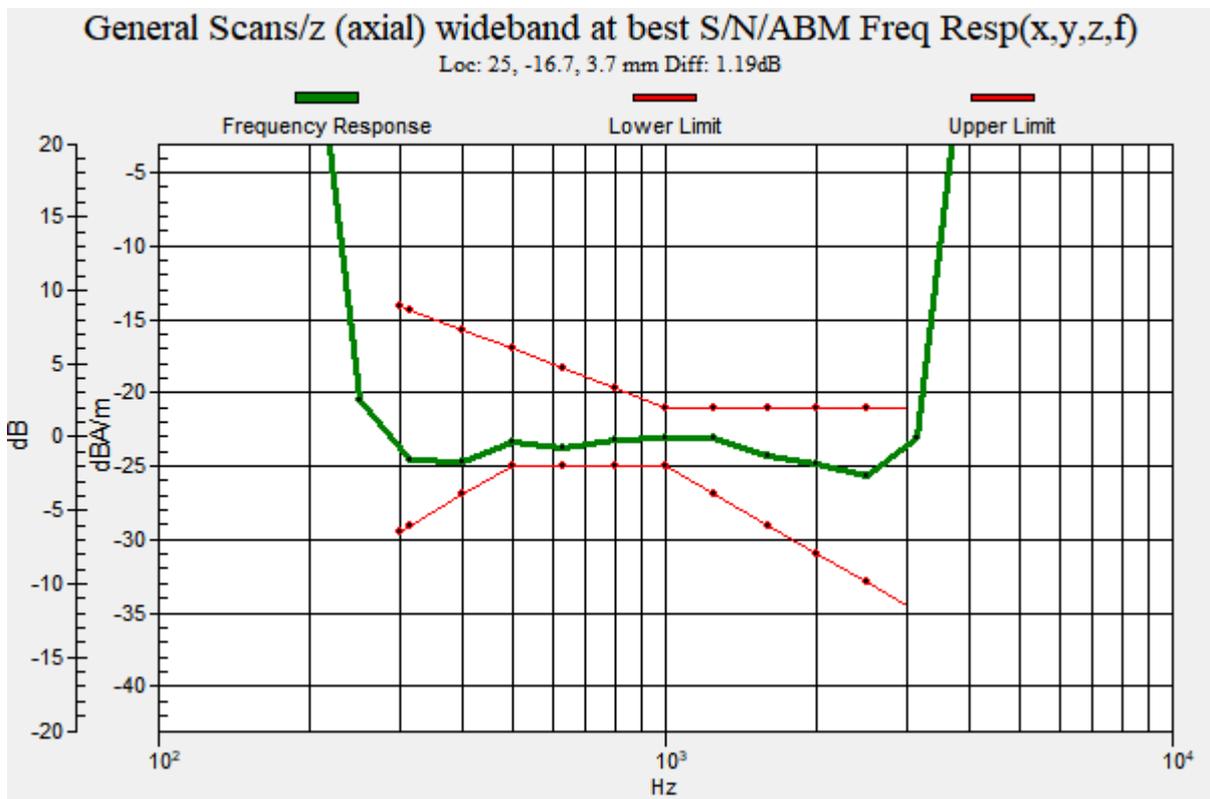
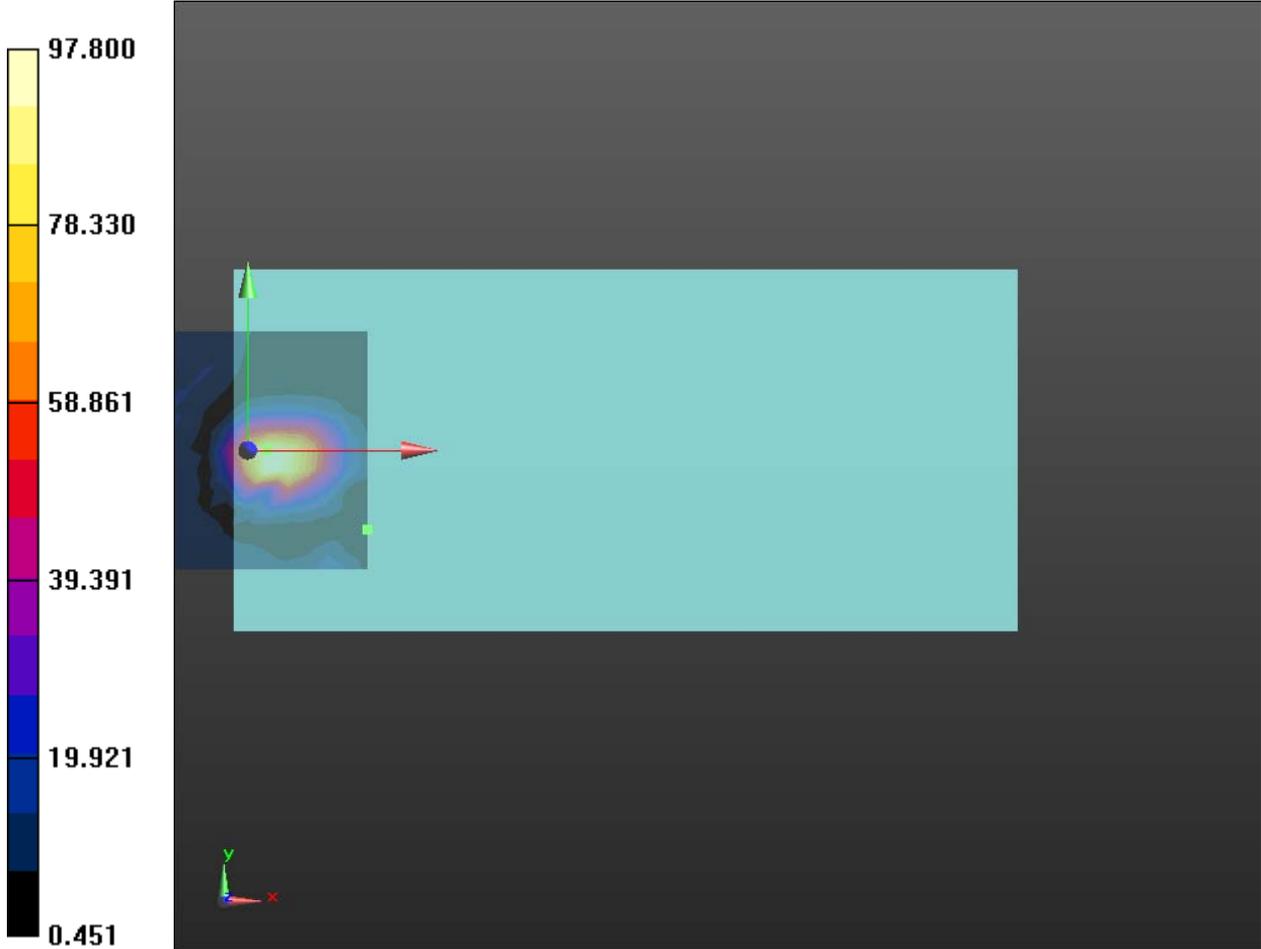
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.19 dB

BWC Factor = 10.81 dB

Location: 25, -16.7, 3.7 mm



**Plot 37 T-Coil WIFI 2.4G: 802.11g Y transversal**

Date: 8/29/2020

Communication System: UID 0, 802.11g (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11g HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

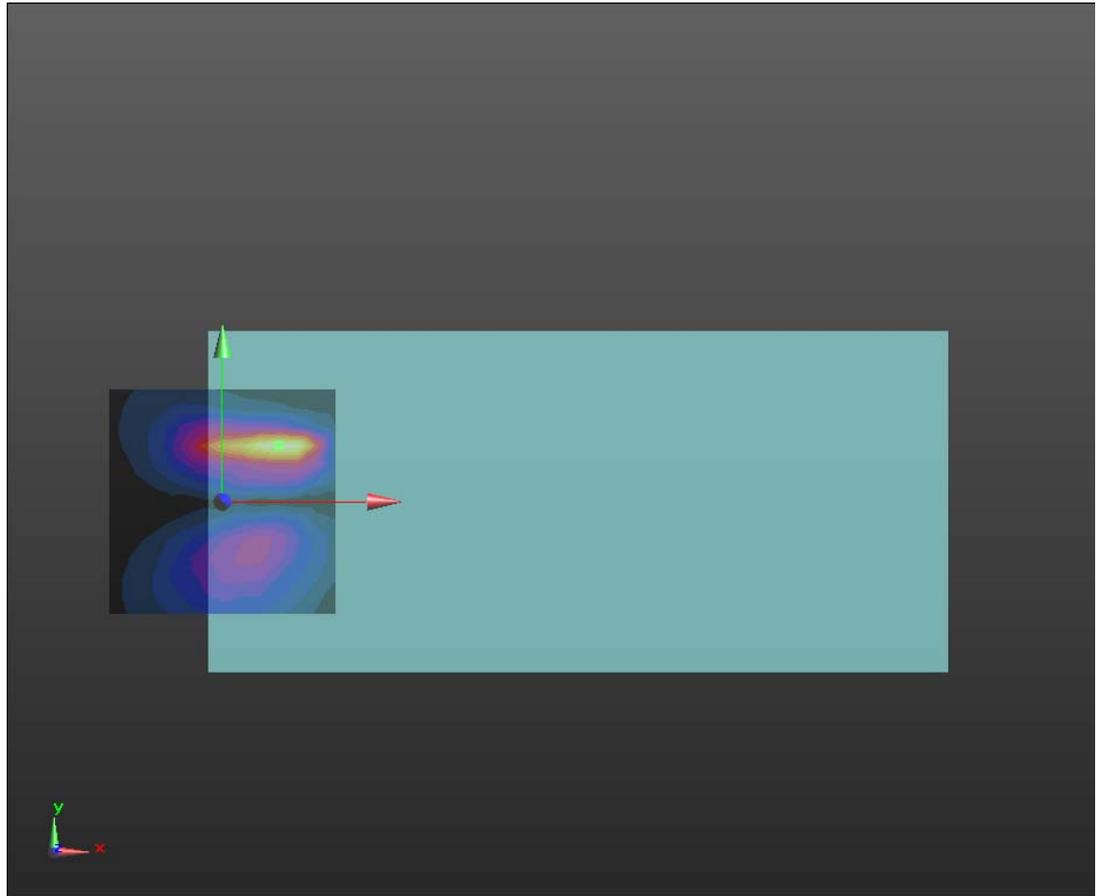
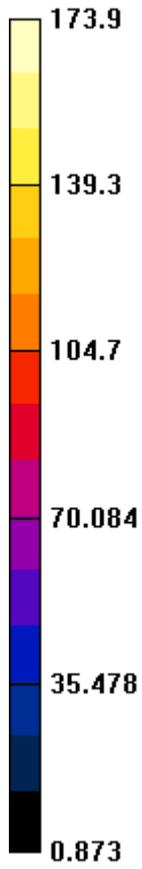
Cursor:

ABM1/ABM2 = 44.81 dB

ABM1 comp = 0.15 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 38 T-Coil WIFI 2.4G: 802.11g Z Axial**

Date: 8/29/2020

Communication System: UID 0, 802.11g (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11g HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 44.07 dB

ABM1 comp = 7.40 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, -4.2, 3.7 mm

802.11g HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

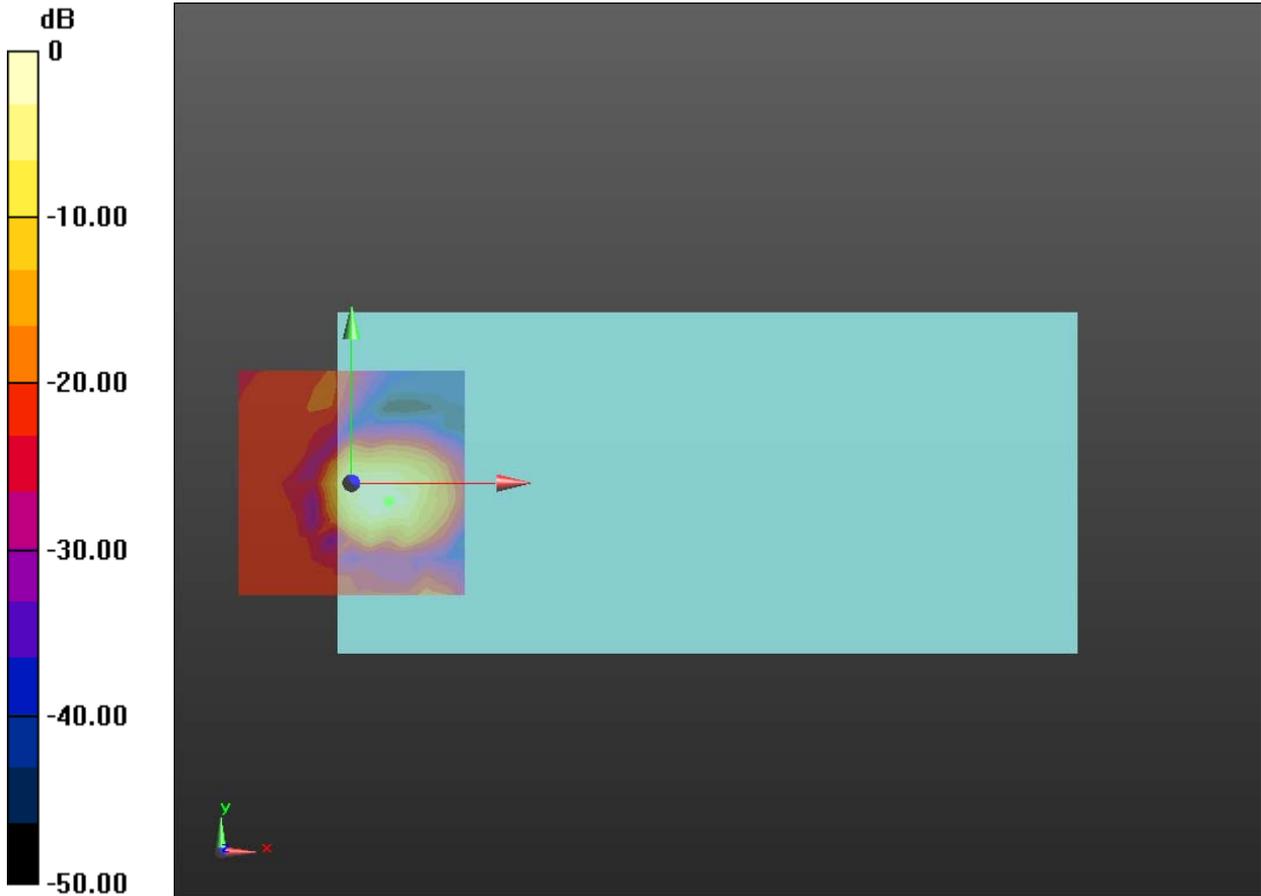
Device Reference Point: 0, 0, -6.3 mm

Cursor:

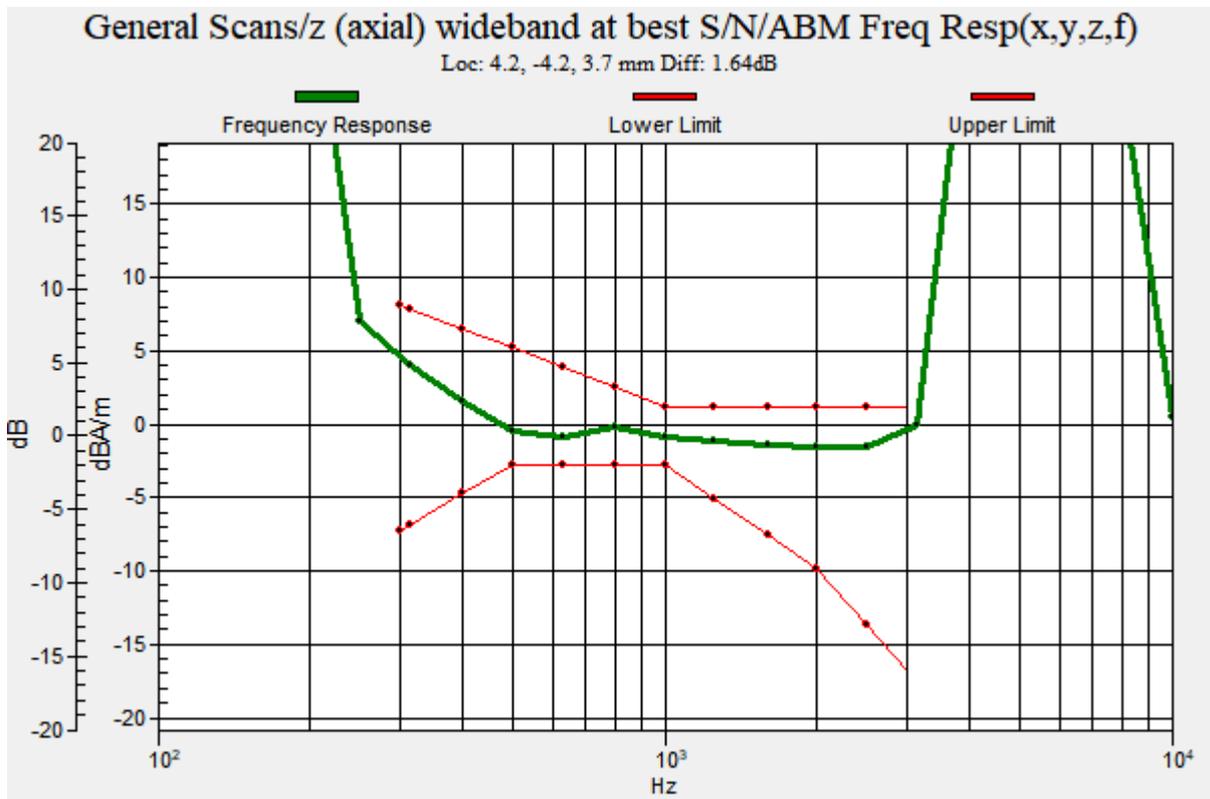
Diff = 1.64 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



0 dB = 159.8 = 44.07 dB



**Plot 39 T-Coil WIFI 2.4G: 802.11n Y transversal**

Date: 8/29/2020

Communication System: UID 0, 802.11n (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11n HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

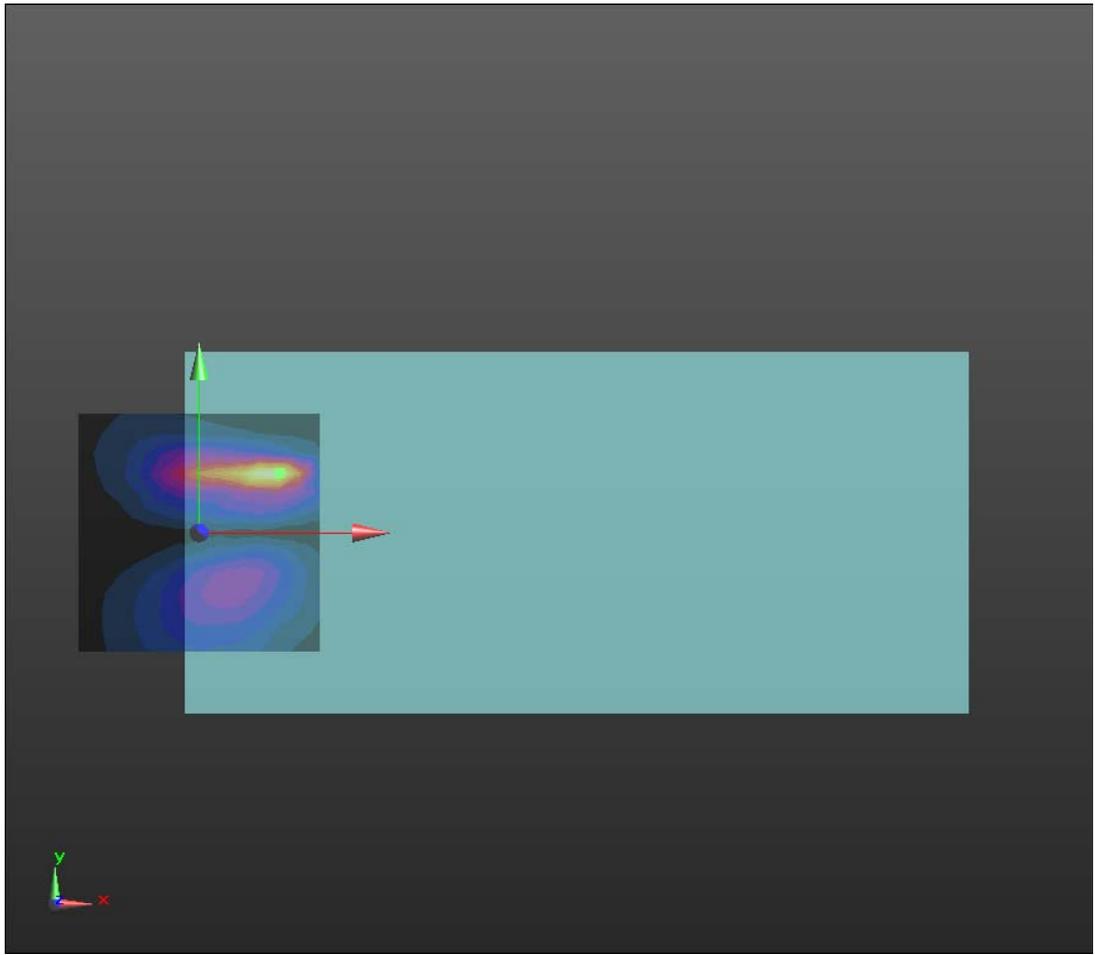
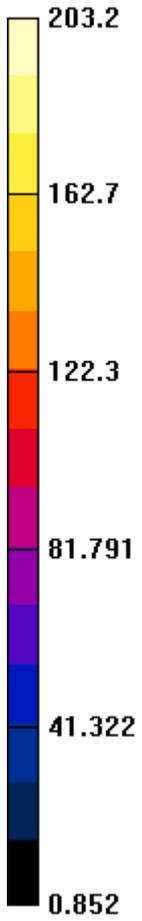
Cursor:

ABM1/ABM2 = 46.16 dB

ABM1 comp = -0.67 dBA/m

BWC Factor = 0.17 dB

Location: 16.7, 12.5, 3.7 mm



**Plot 40 T-Coil WIFI 2.4G: 802.11n Z Axial**

Date: 8/29/2020

Communication System: UID 0, 802.11n (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11n HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 49.57 dB

ABM1 comp = 2.58 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11n HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

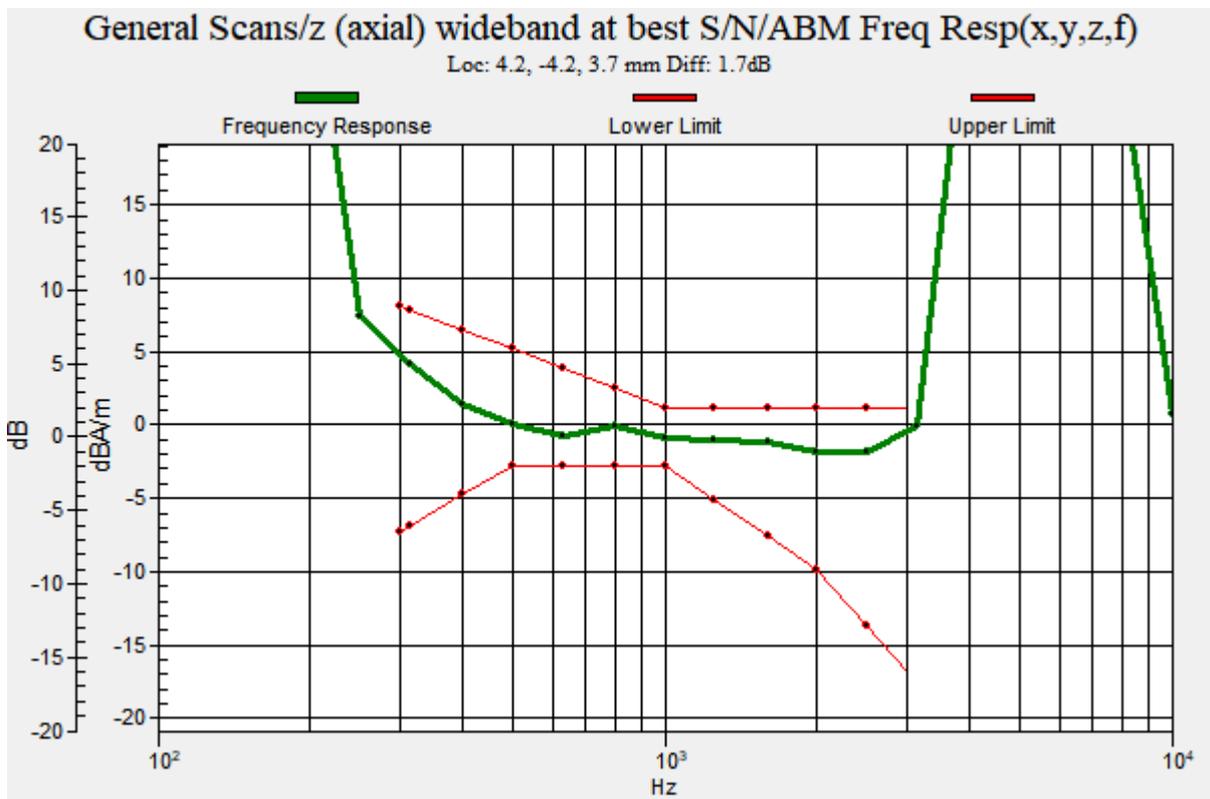
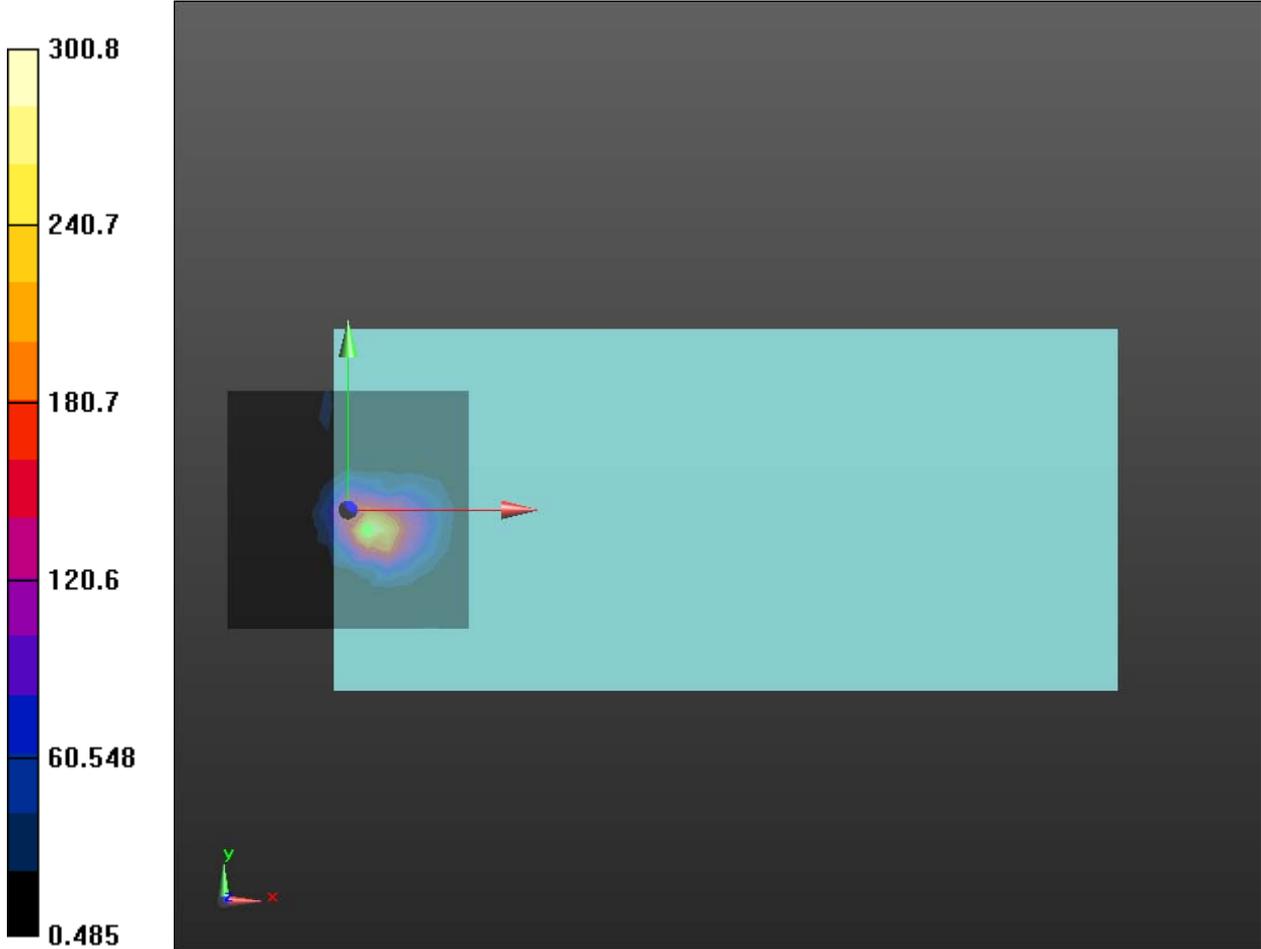
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.70 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 41 T-Coil WIFI 5G: 802.11a (U-NII-1) Y transversal**

Date: 9/1/2020

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

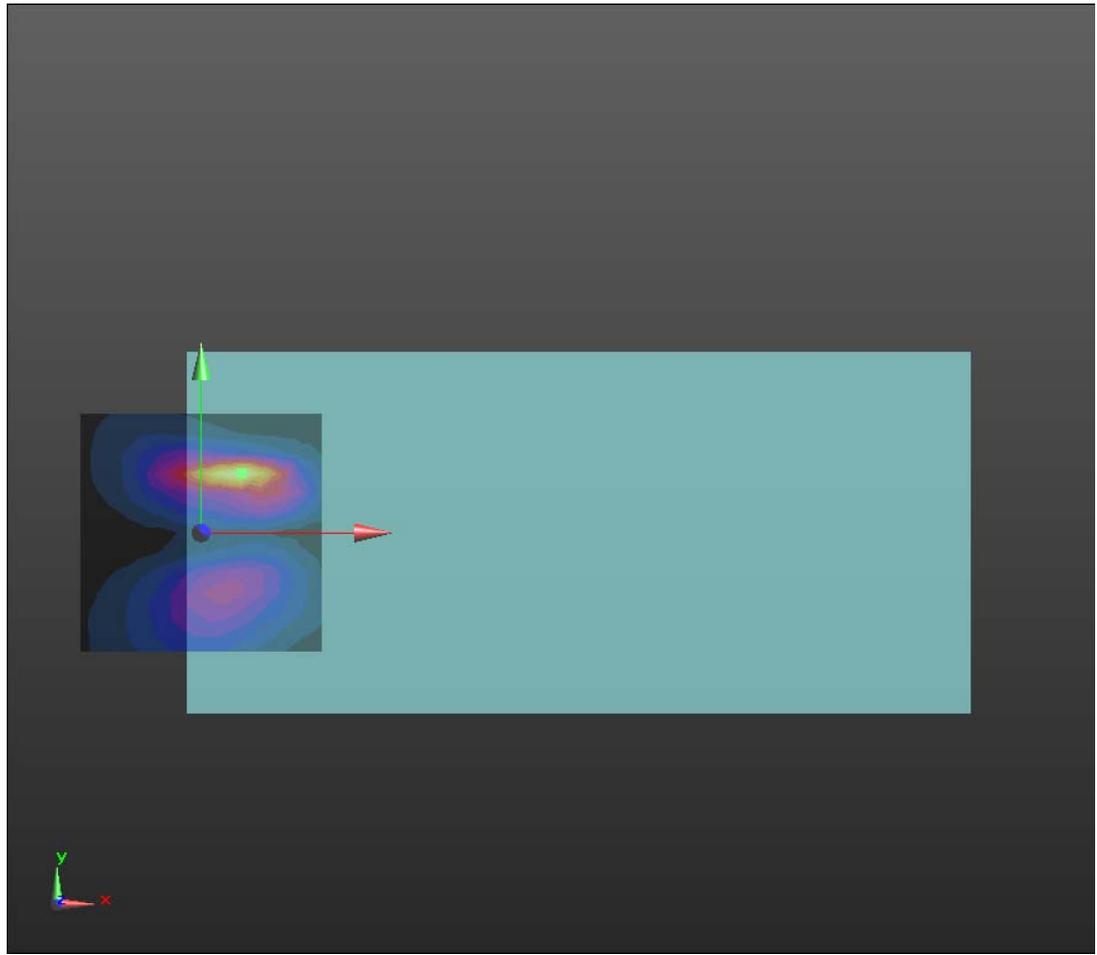
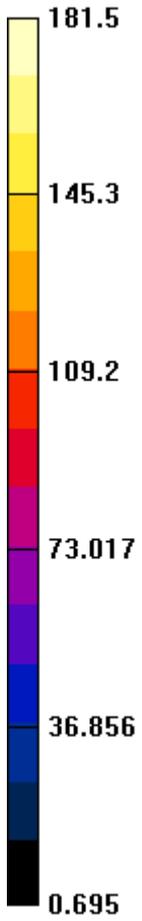
Cursor:

ABM1/ABM2 = 45.18 dB

ABM1 comp = -1.72 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, 12.5, 3.7 mm



**Plot 42 T-Coil WIFI 5G: 802.11a (U-NII-1) Z Axial**

Date: 9/1/2020

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.70 dB

ABM1 comp = 3.28 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

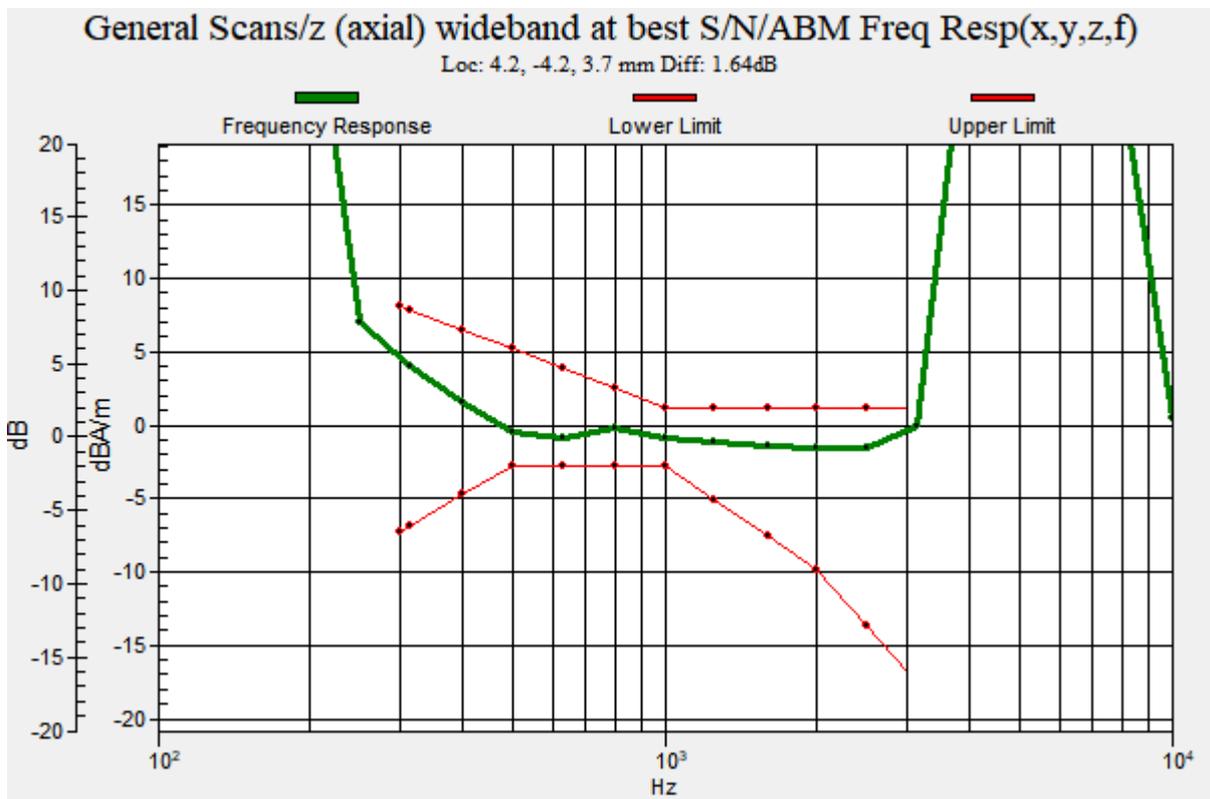
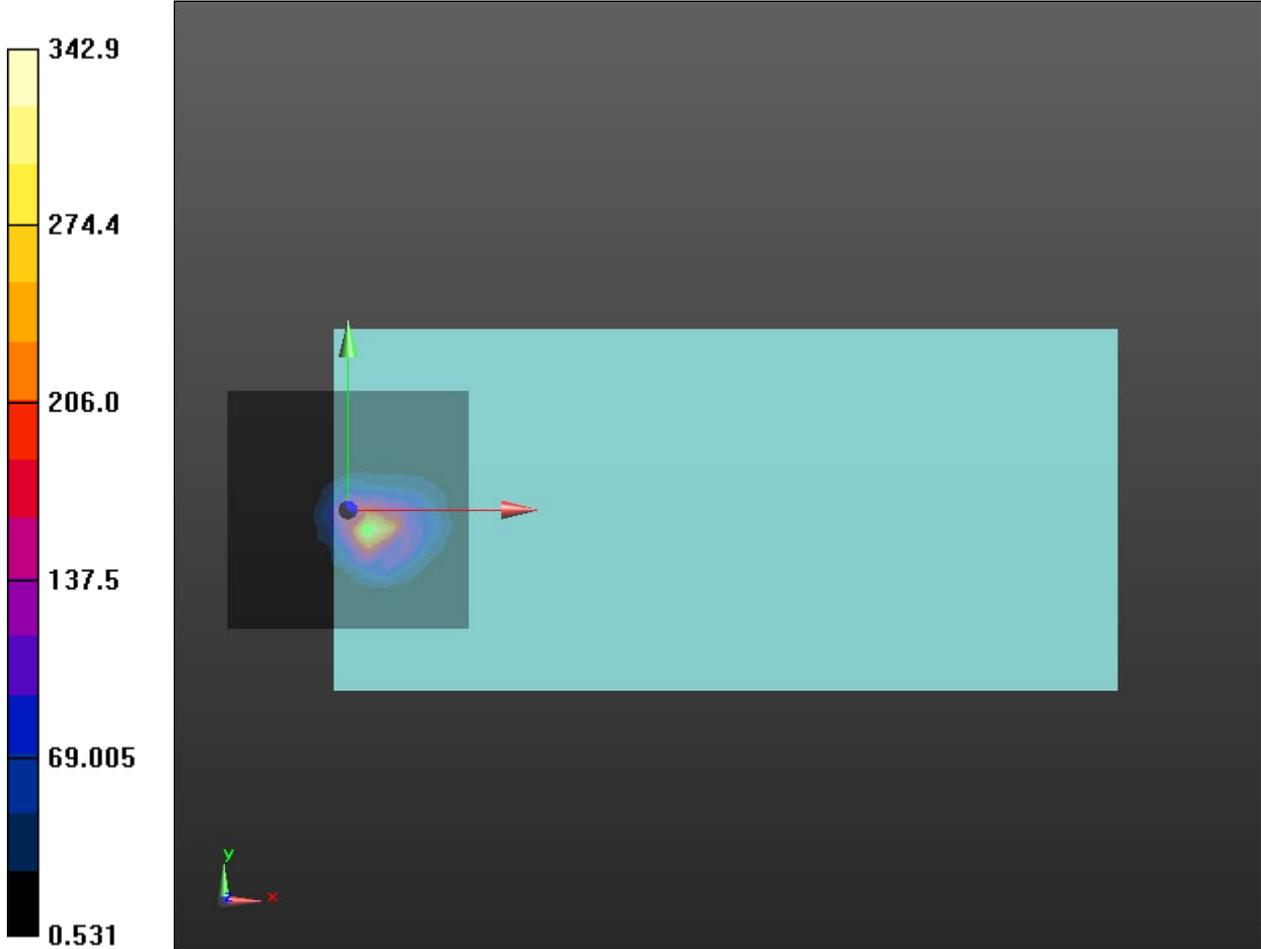
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.64 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 43 T-Coil WIFI 5G: 802.11a (U-NII-3) Y transversal**

Date: 9/3/2020

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

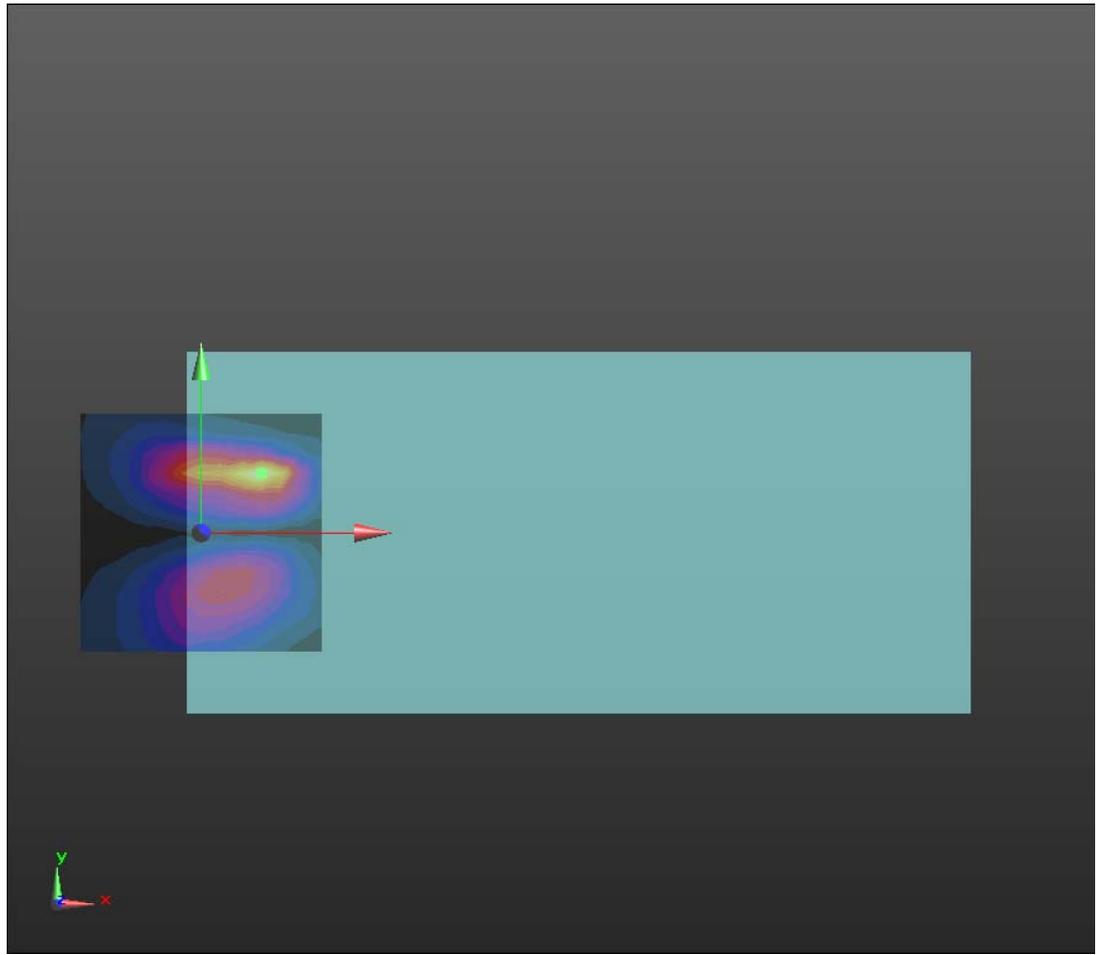
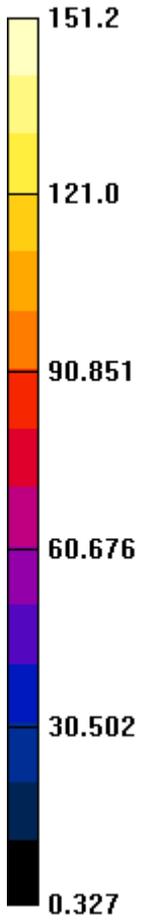
Cursor:

ABM1/ABM2 = 43.59 dB

ABM1 comp = 0.83 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 44 T-Coil WIFI 5G: 802.11a (U-NII-3) Z Axial**

Date: 9/3/2020

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 15.33

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.38 dB

ABM1 comp = 3.46 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11a HAC_TCoil_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 39.13

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

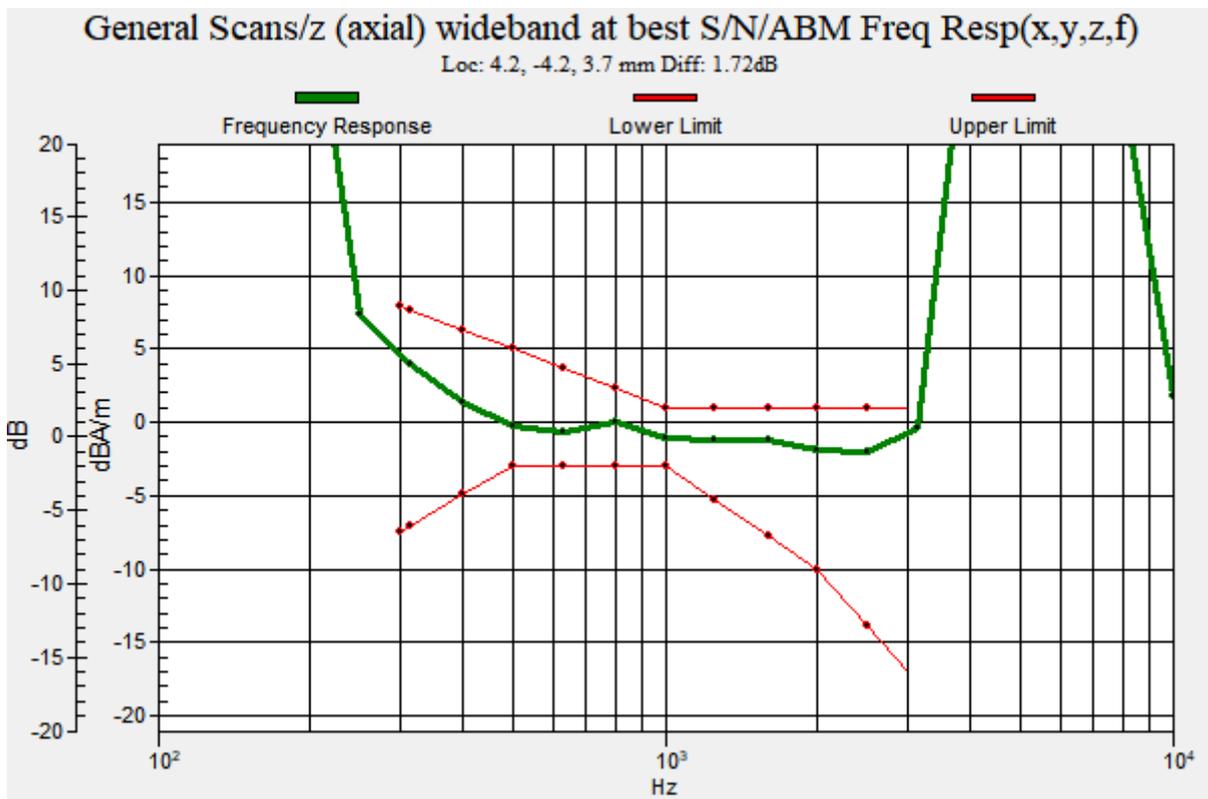
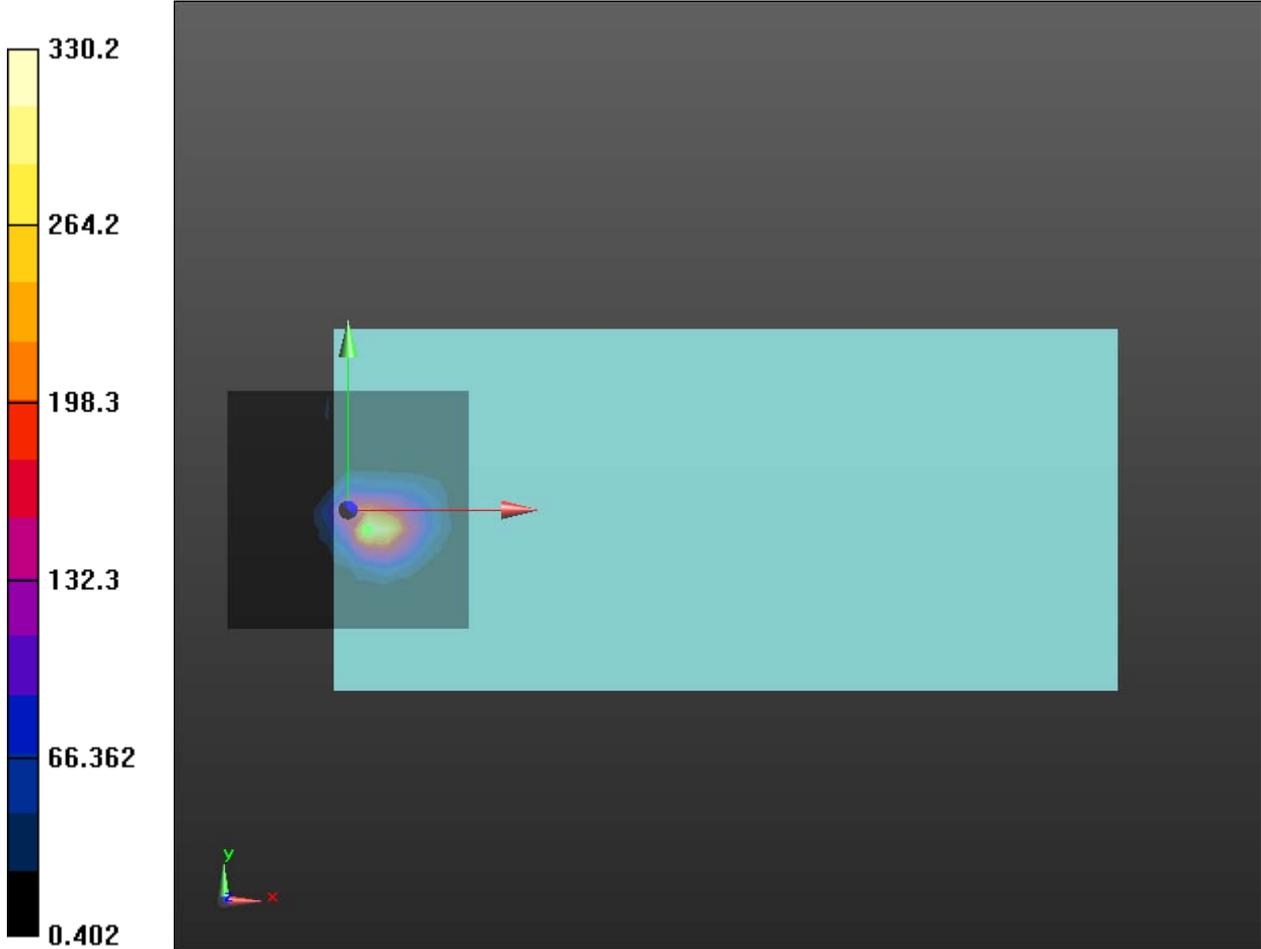
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.72 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**OTT****Plot 45 T-Coil, Full RB, LTE Band 2, 6kbps, Y transversal**

Date: 9/8/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B2 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

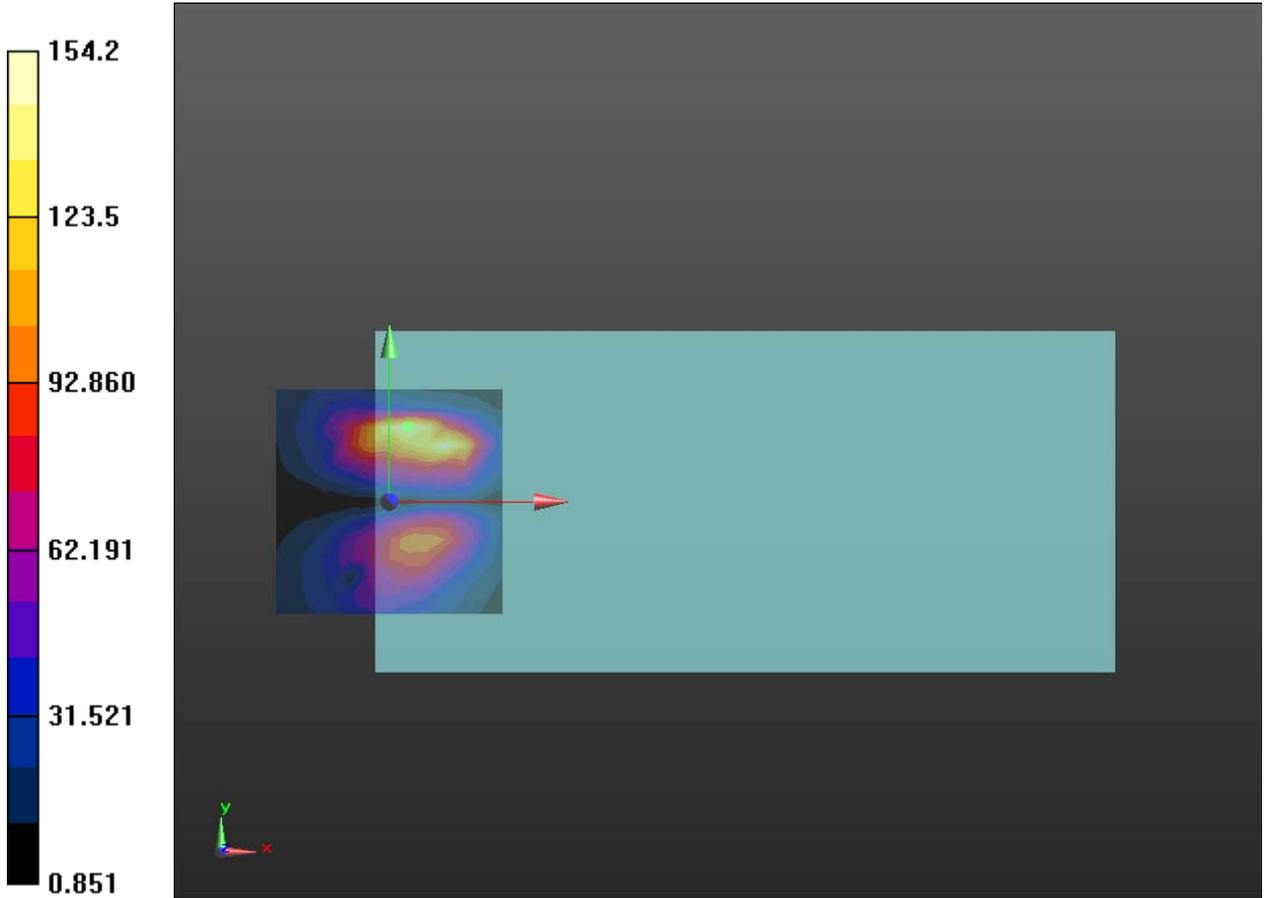
Cursor:

ABM1/ABM2 = 43.76 dB

ABM1 comp = -3.46 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, 16.7, 3.7 mm



**Plot 46 T-Coil, Full RB, LTE Band 2, 6kbps, Z Axial**

Date: 9/8/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B2 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.47 dB

ABM1 comp = 5.79 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, -4.2, 3.7 mm

LTE B2 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

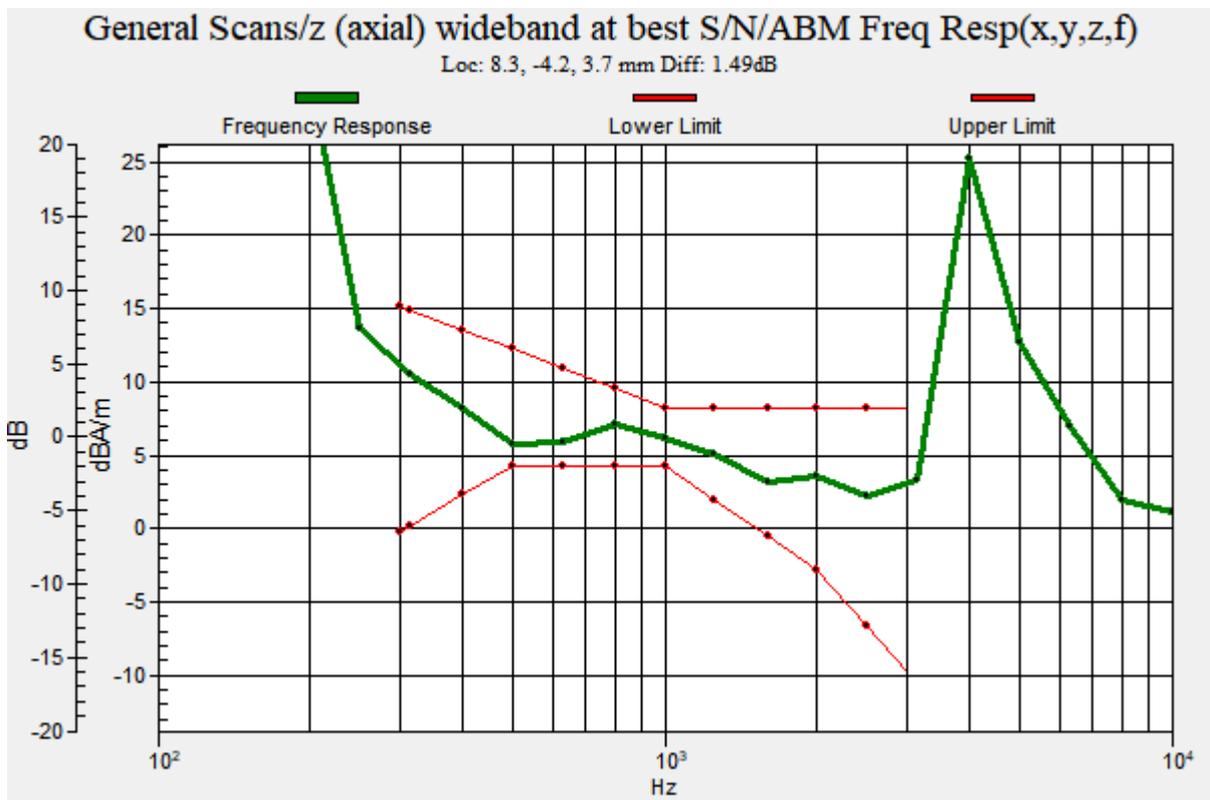
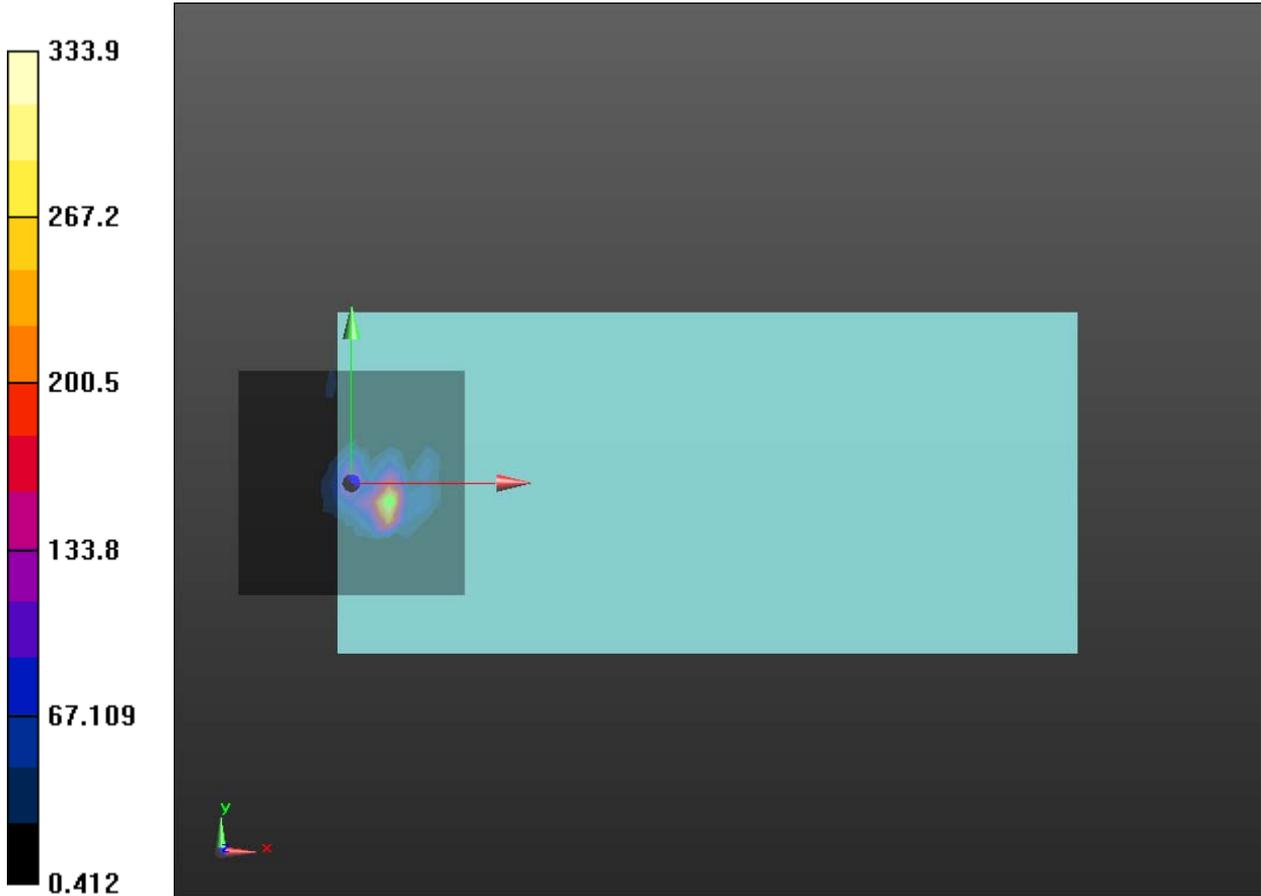
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.49 dB

BWC Factor = 10.81 dB

Location: 8.3, -4.2, 3.7 mm



**Plot 47 T-Coil, Full RB, LTE Band 4, 6kbps, Y transversal**

Date: 9/10/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B4 HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

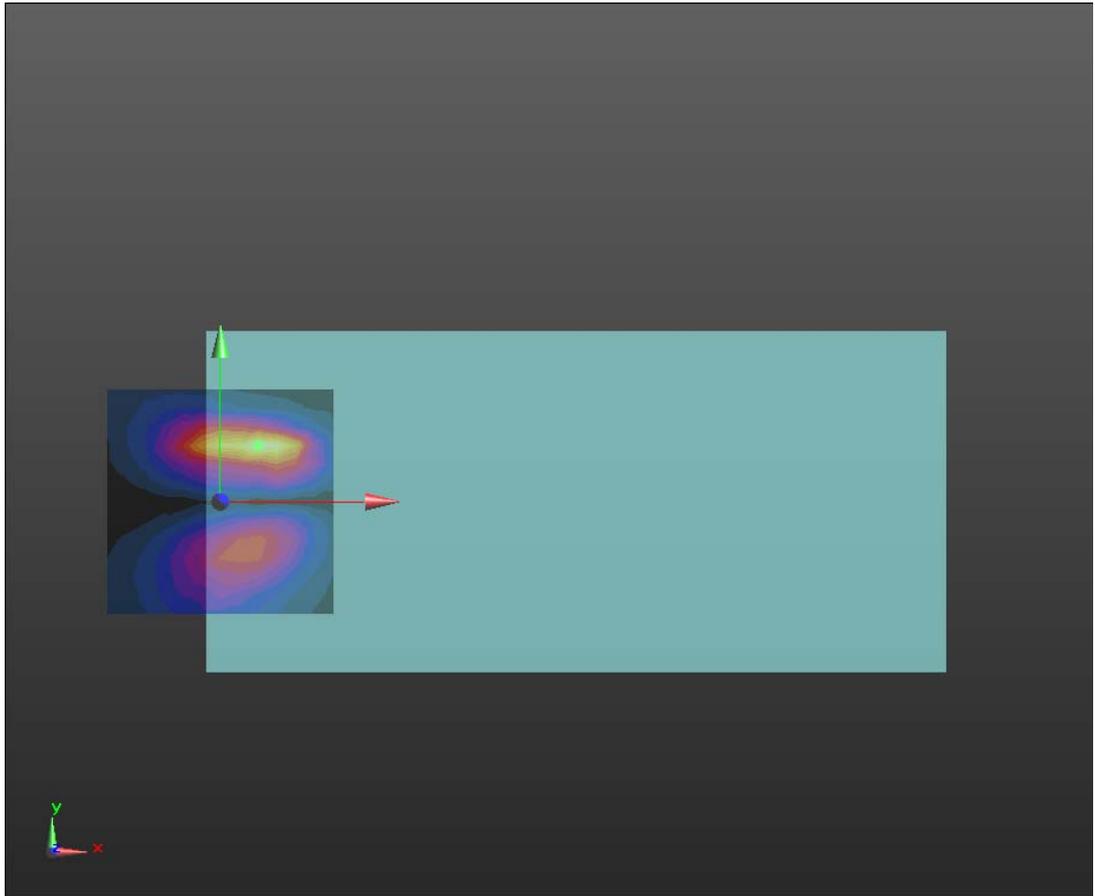
Cursor:

ABM1/ABM2 = 43.82 dB

ABM1 comp = 1.14 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, 12.5, 3.7 mm



**Plot 48 T-Coil, Full RB, LTE Band 4, 6kbps, Z Axial**

Date: 9/10/2020

Communication System: UID 10169 - CAE, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74111

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B4 HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 55.17 dB

ABM1 comp = 4.90 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B4 HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

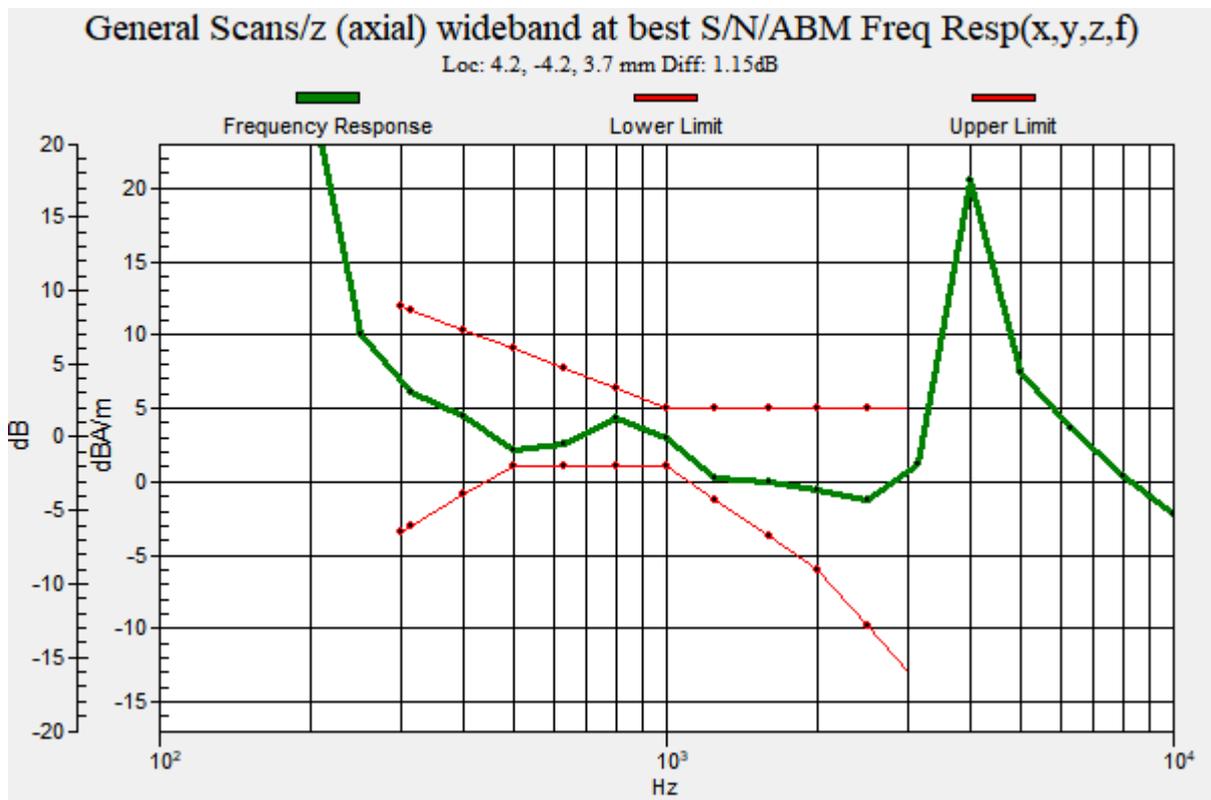
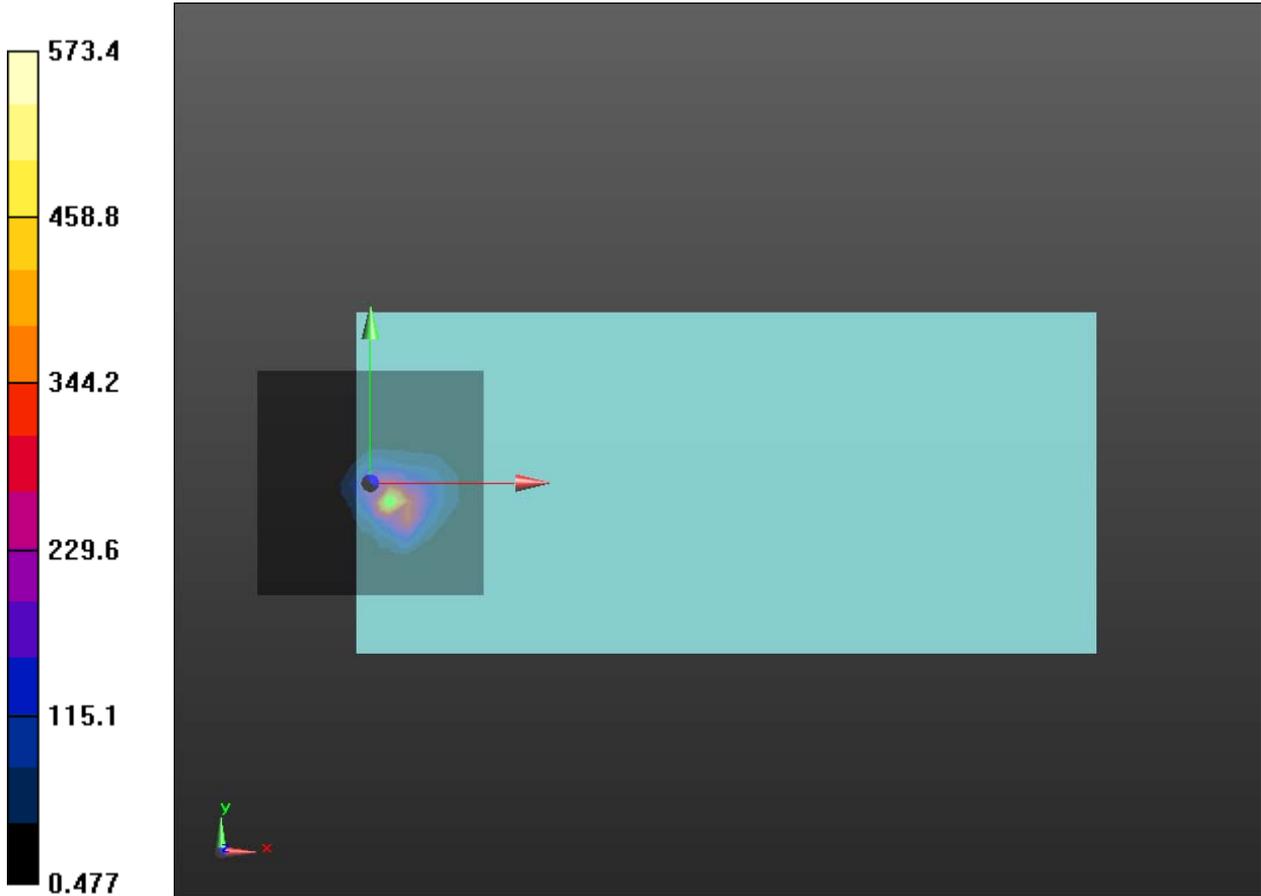
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.15 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 49 T-Coil, Full RB, LTE Band 5, 6kbps, Y transversal**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B5 HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

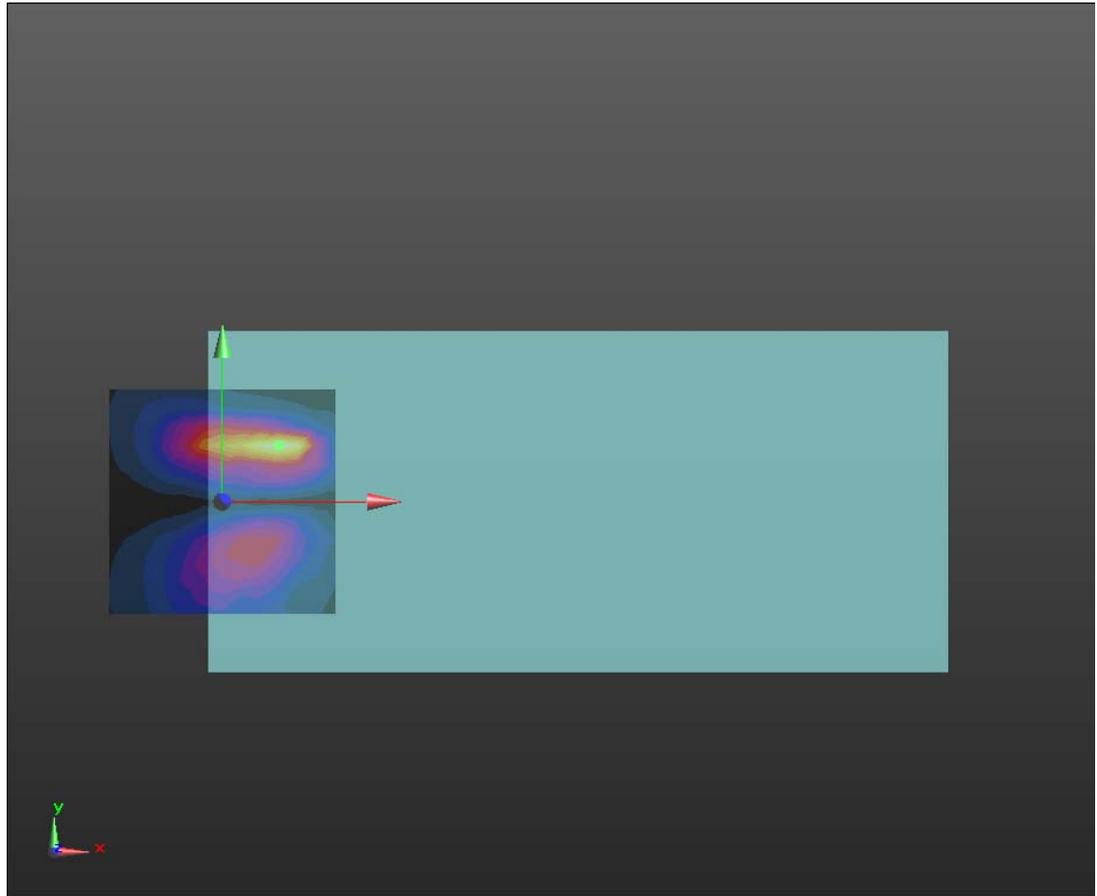
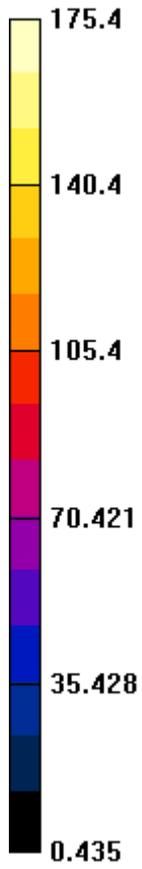
Cursor:

ABM1/ABM2 = 44.88 dB

ABM1 comp = 1.77 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 50 T-Coil, Full RB, LTE Band 5, 6kbps, Z Axial**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B5 HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 54.76 dB

ABM1 comp = 4.76 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B5 HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

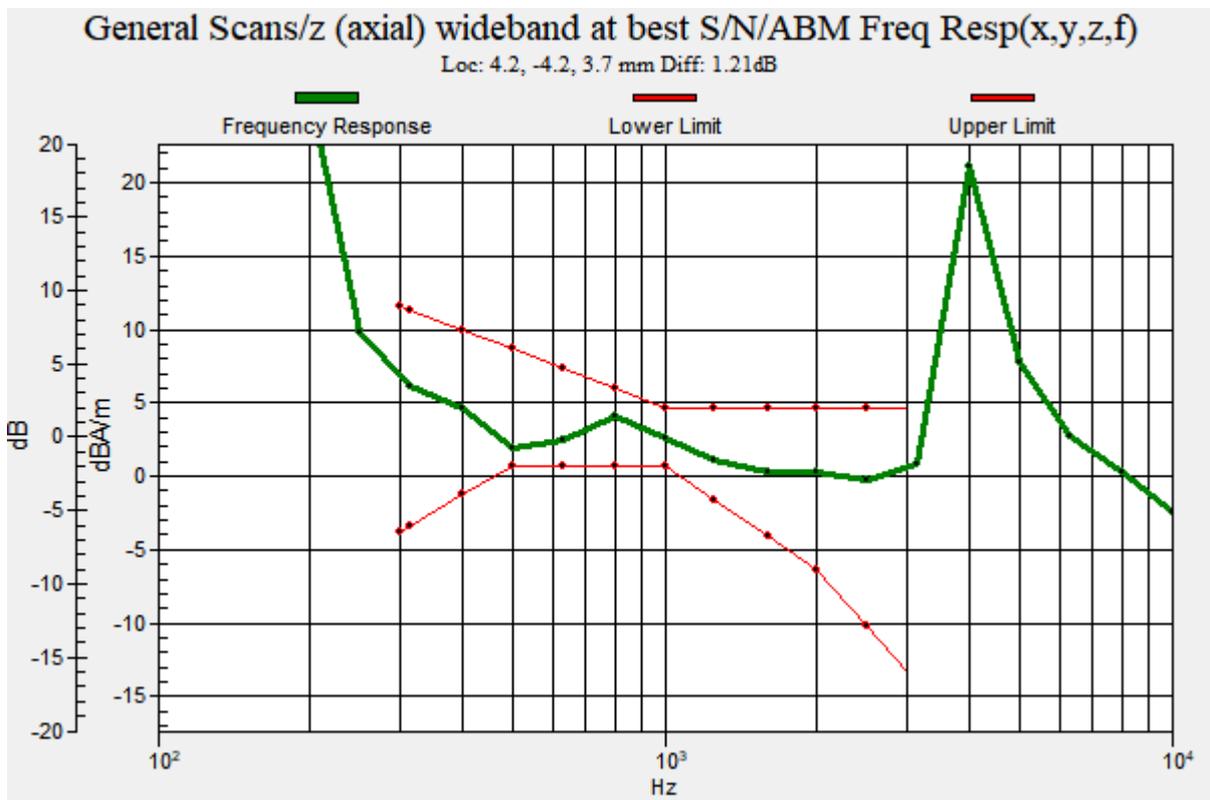
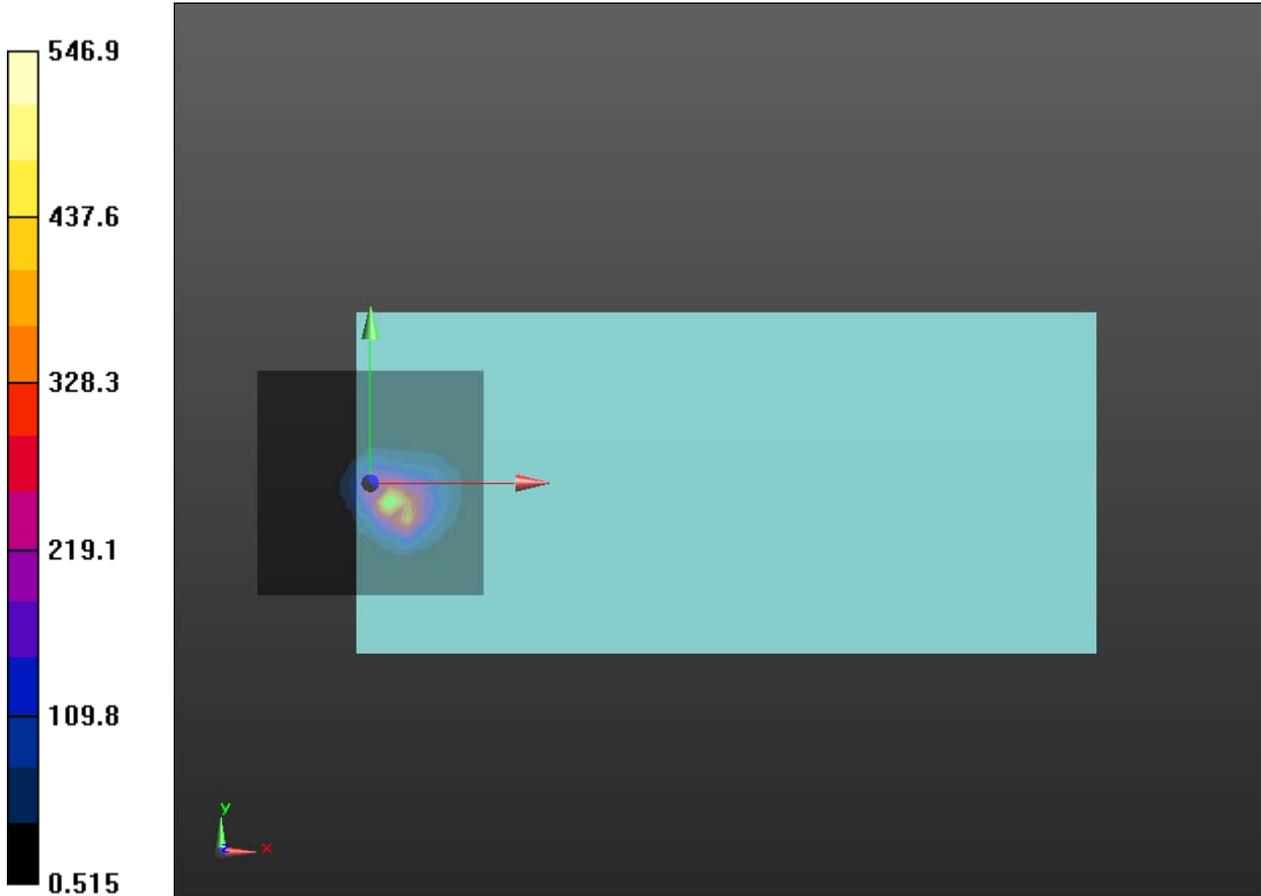
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.21 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 51 T-Coil, Full RB, LTE Band 12, 6kbps, Y transversal**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B12 HAC_TCoil_WD_Emission NB/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

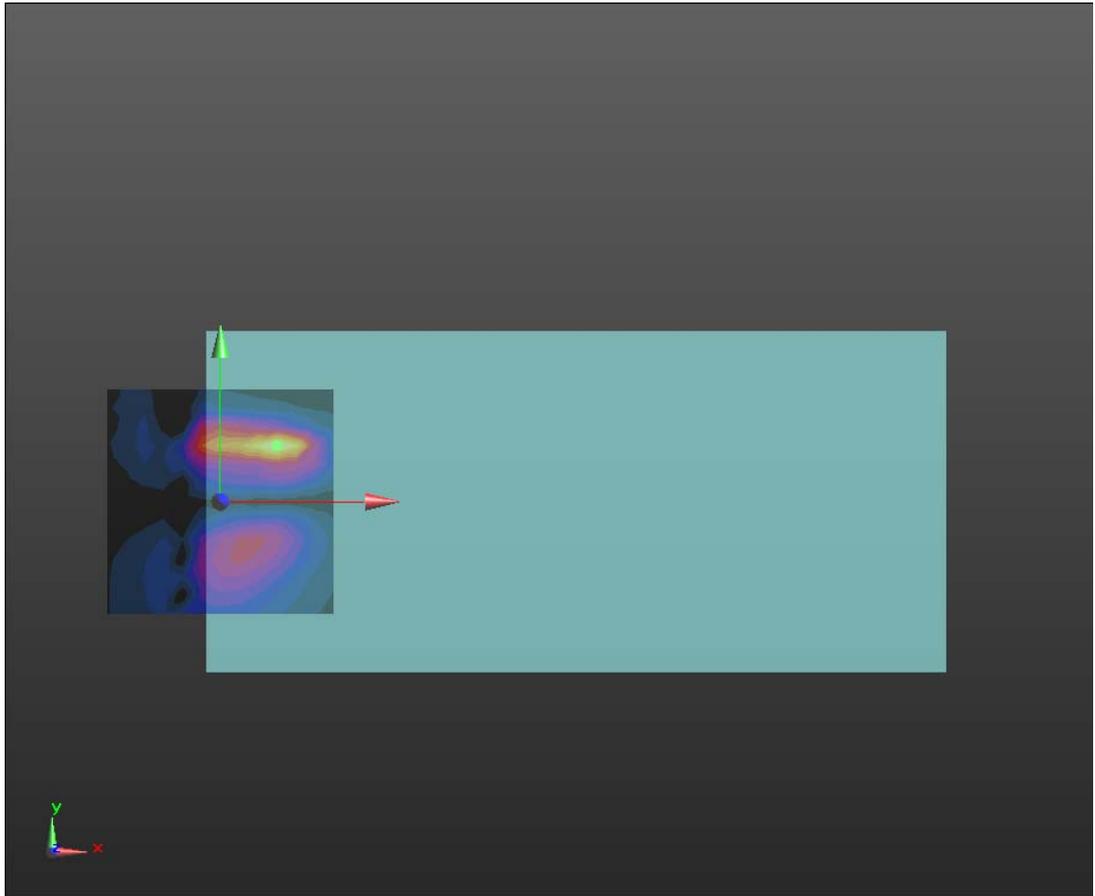
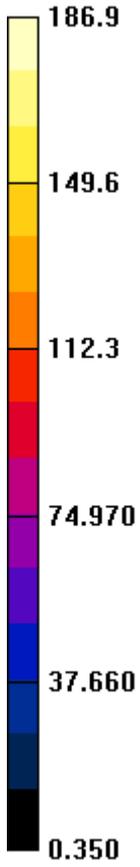
Cursor:

ABM1/ABM2 = 45.43 dB

ABM1 comp = 1.87 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 52 T-Coil, Full RB, LTE Band 12, 6kbps, Z Axial**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B12 HAC_TCoil_WD_Emission NB/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 55.24 dB

ABM1 comp = 4.81 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B12 HAC_TCoil_WD_Emission NB/General Scans/z (axial) wideband at best S/N/ABM**Freq Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

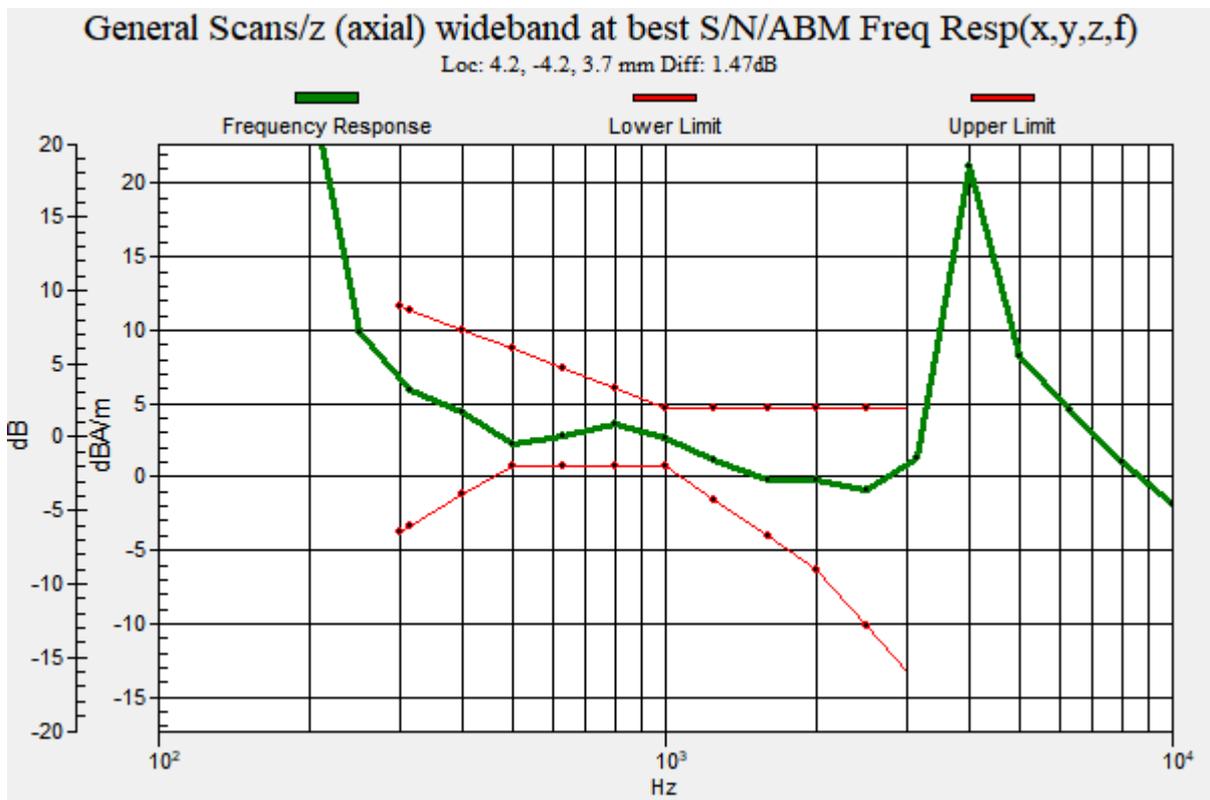
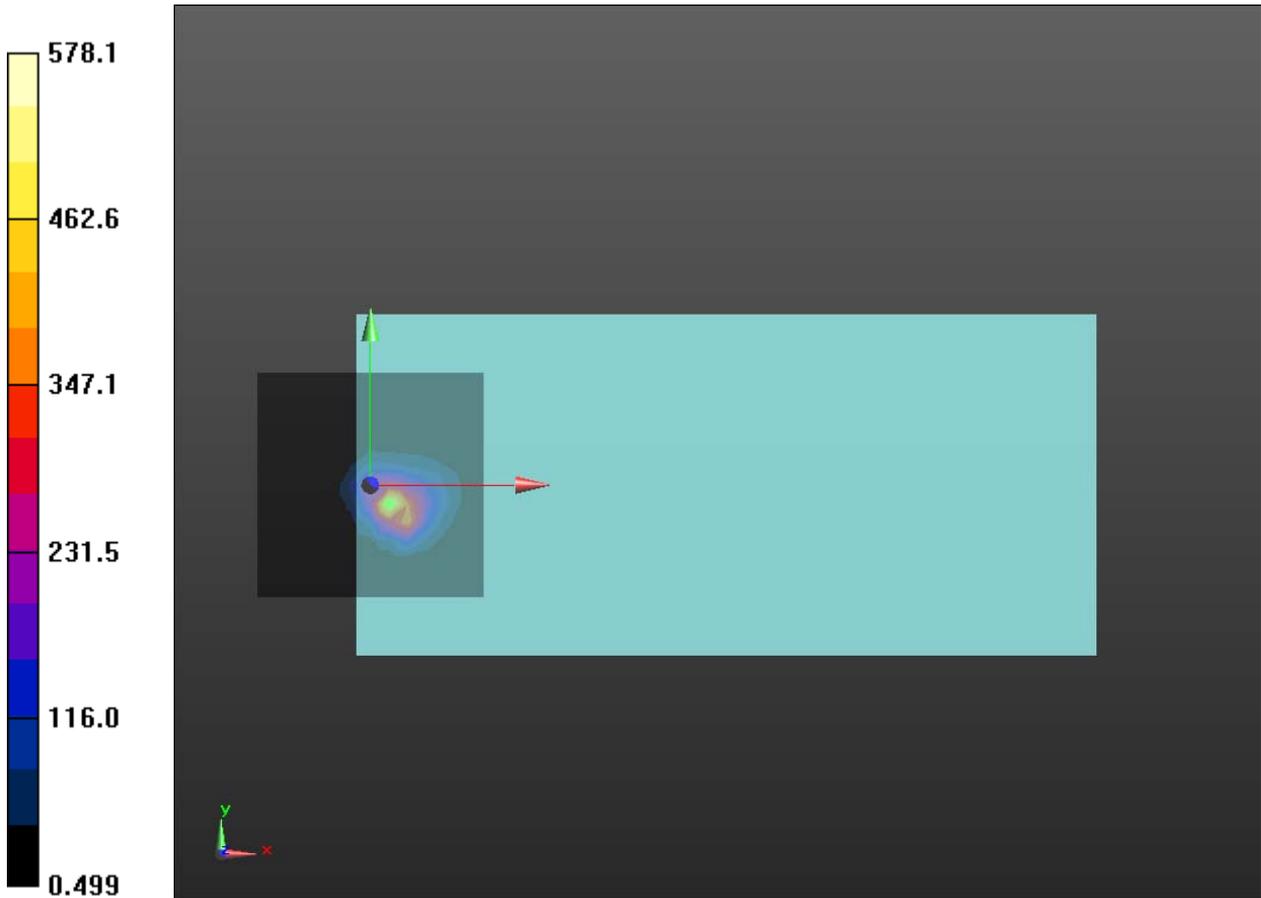
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.47 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 53 T-Coil, Full RB, LTE Band 13, 6kbps, Y transversal**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

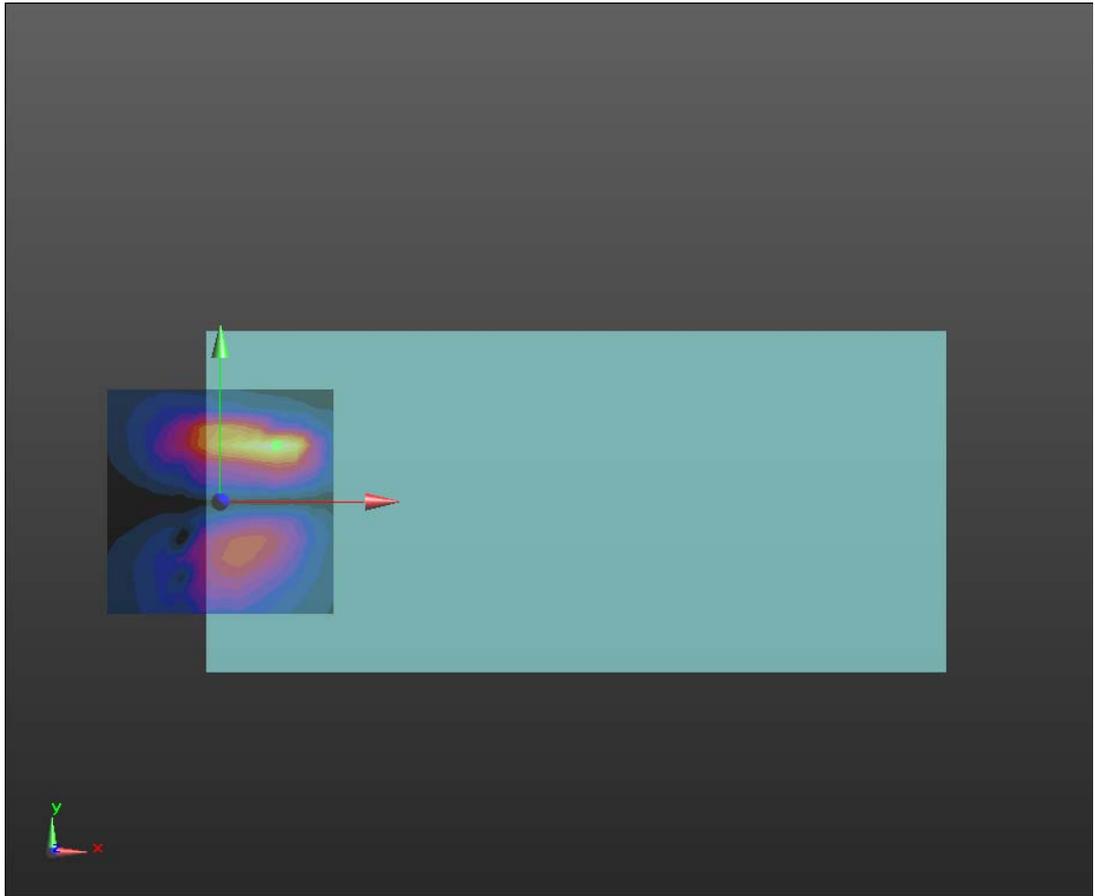
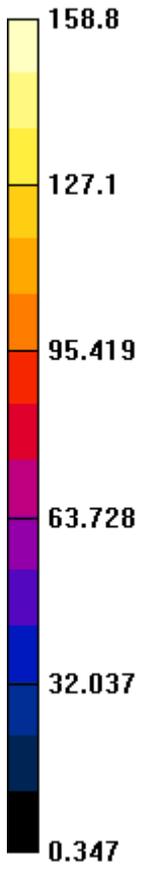
Cursor:

ABM1/ABM2 = 44.02 dB

ABM1 comp = 1.73 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 54 T-Coil, Full RB, LTE Band 13, 6kbps, Z Axial**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B13 HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 54.78 dB

ABM1 comp = 4.65 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

LTE B13 HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

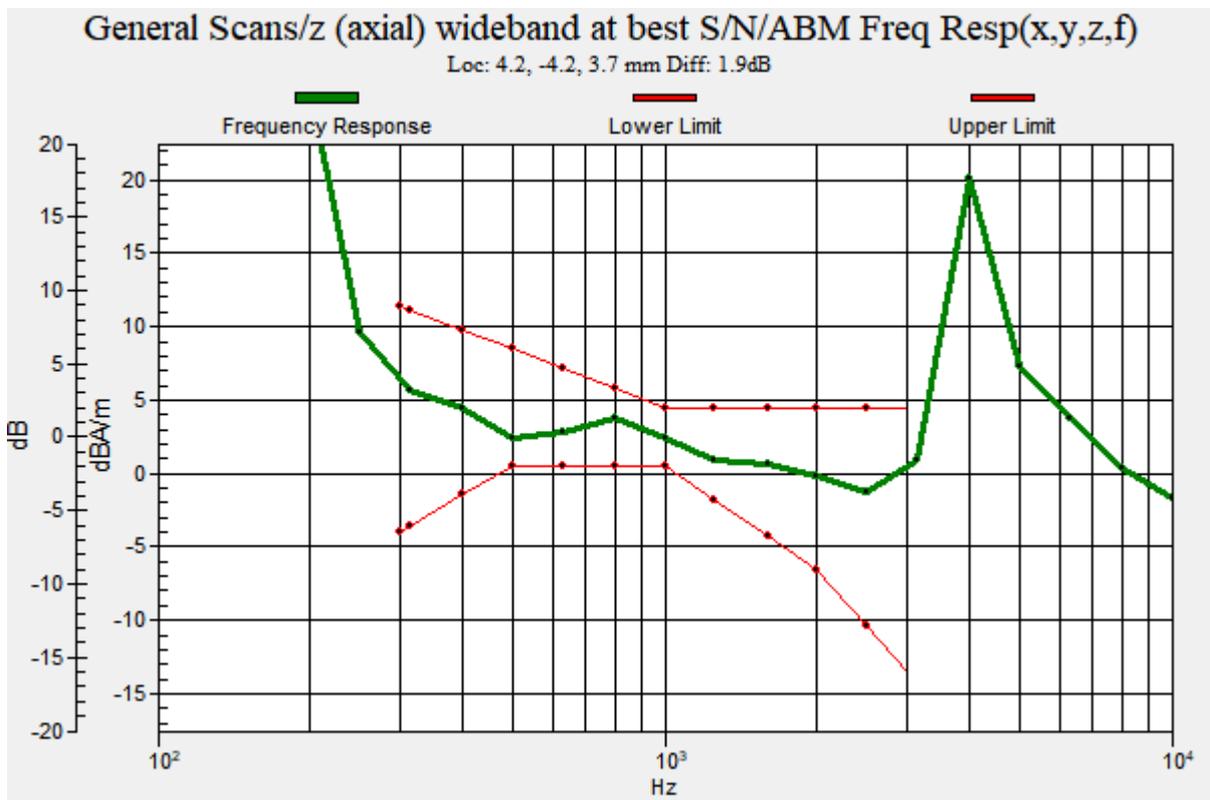
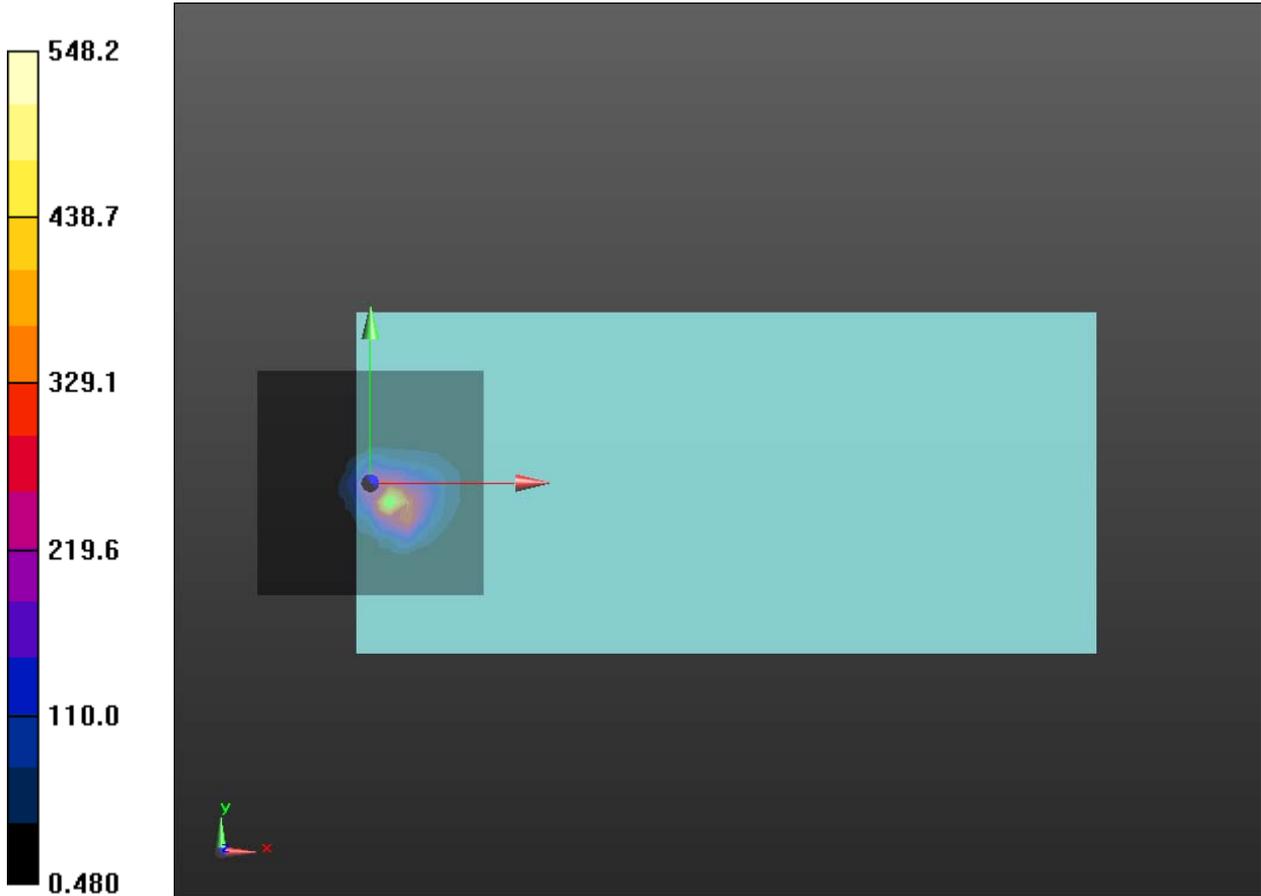
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.90 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 55 T-Coil, Full RB, LTE Band 66, 6kbps, Y transversal**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B66 HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM**SNR(x,y,z) (13x13x1):** Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

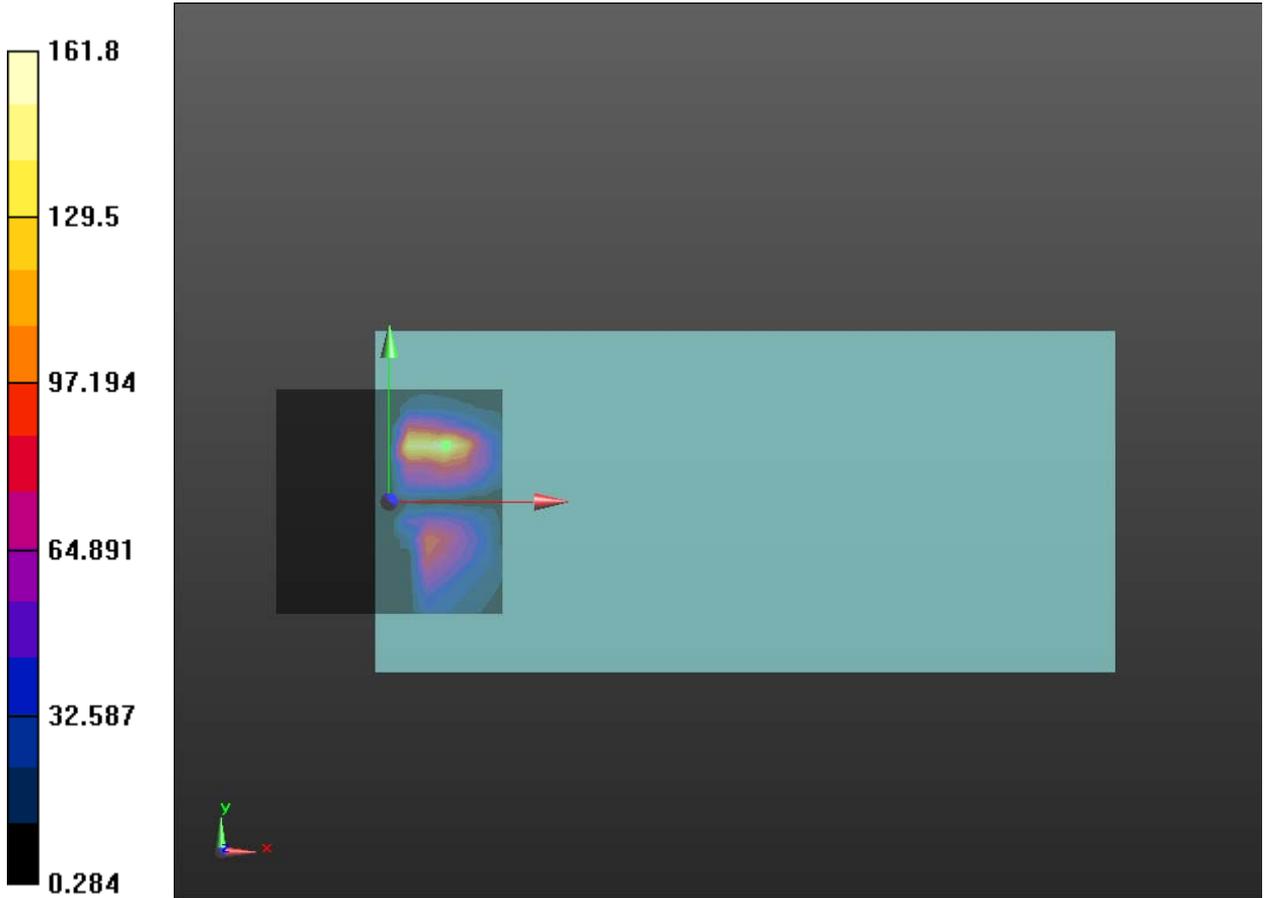
Cursor:

ABM1/ABM2 = 44.18 dB

ABM1 comp = 2.28 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 56 T-Coil, Full RB, LTE Band 66, 6kbps, Z Axial**

Date: 9/10/2020

Communication System: UID 0, LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

LTE B66 HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.50 dB

ABM1 comp = 8.36 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, -4.2, 3.7 mm

LTE B66 HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

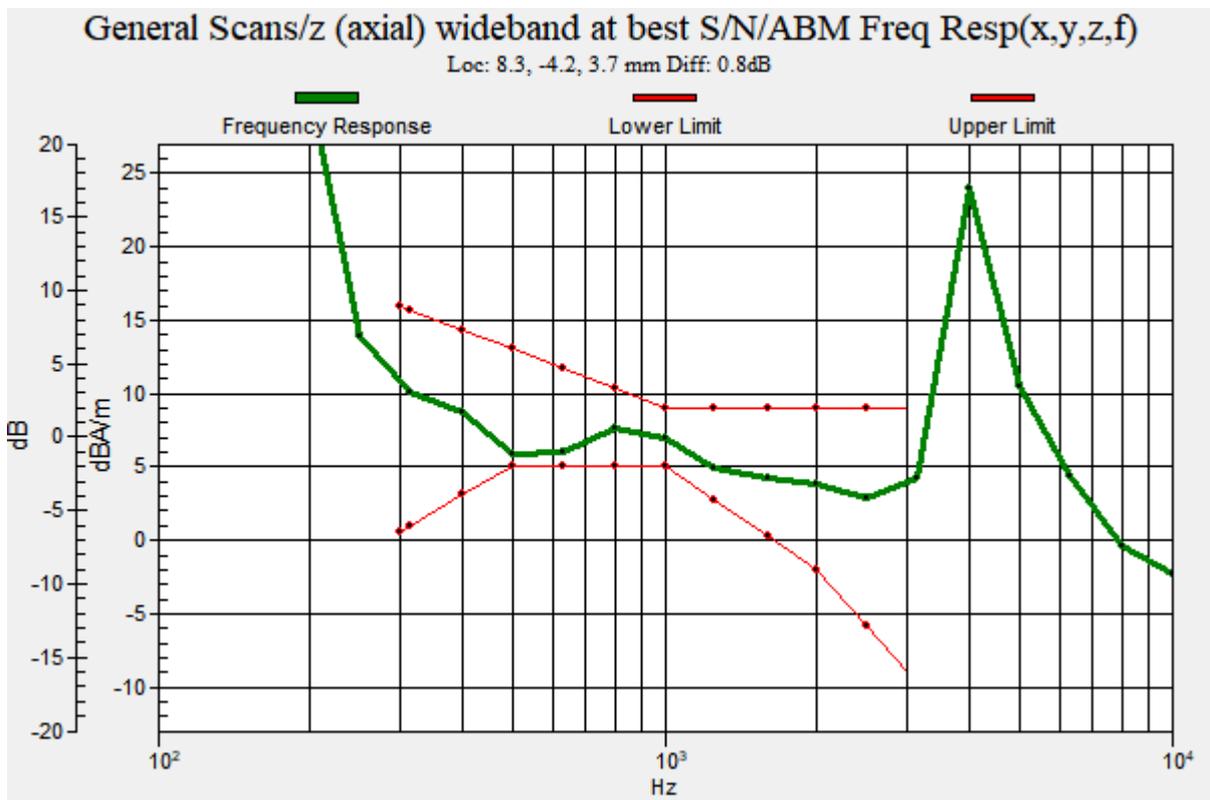
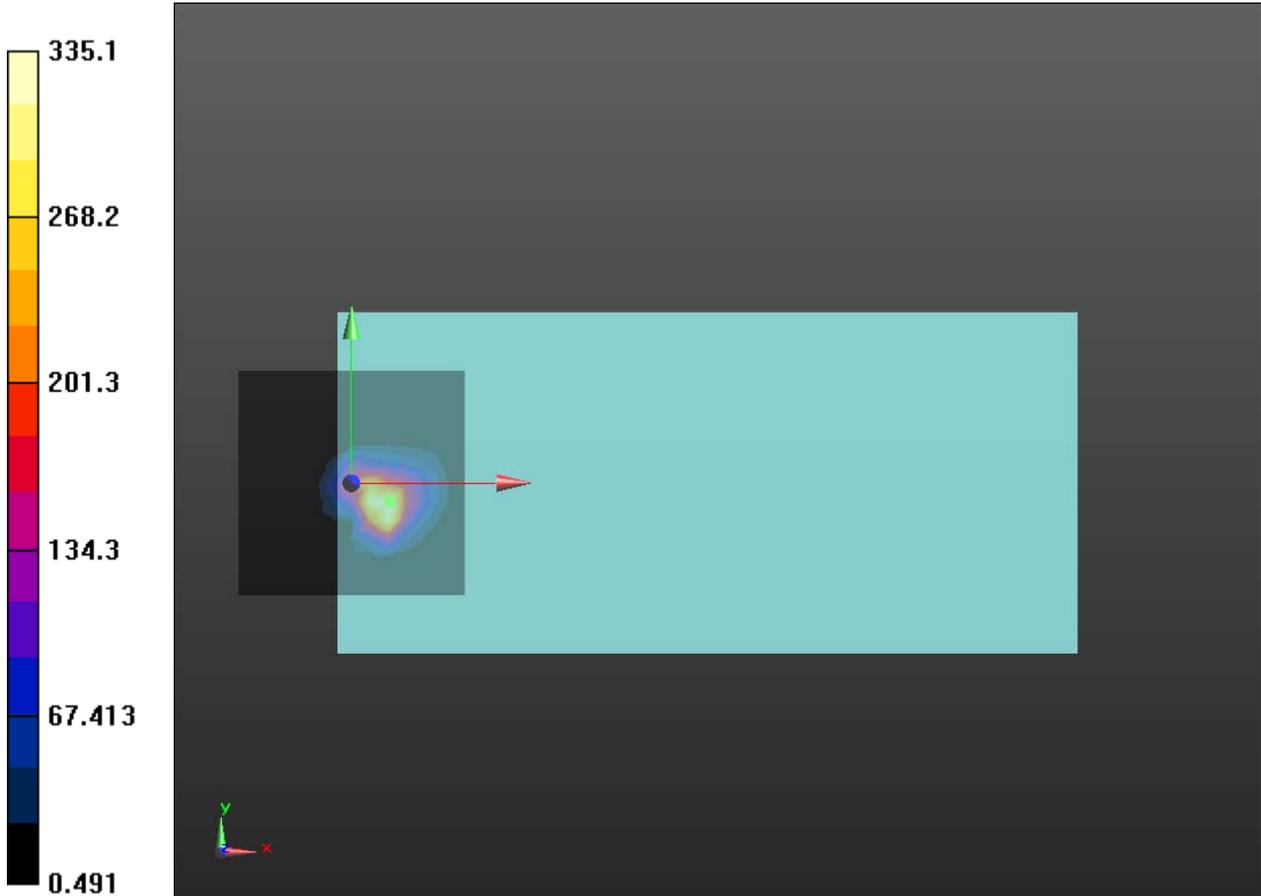
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 0.80 dB

BWC Factor = 10.81 dB

Location: 8.3, -4.2, 3.7 mm



**Plot 57 T-Coil WIFI 2.4G: 802.11b, 6kbps, Y transversal**

Date: 9/8/2020

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11b HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

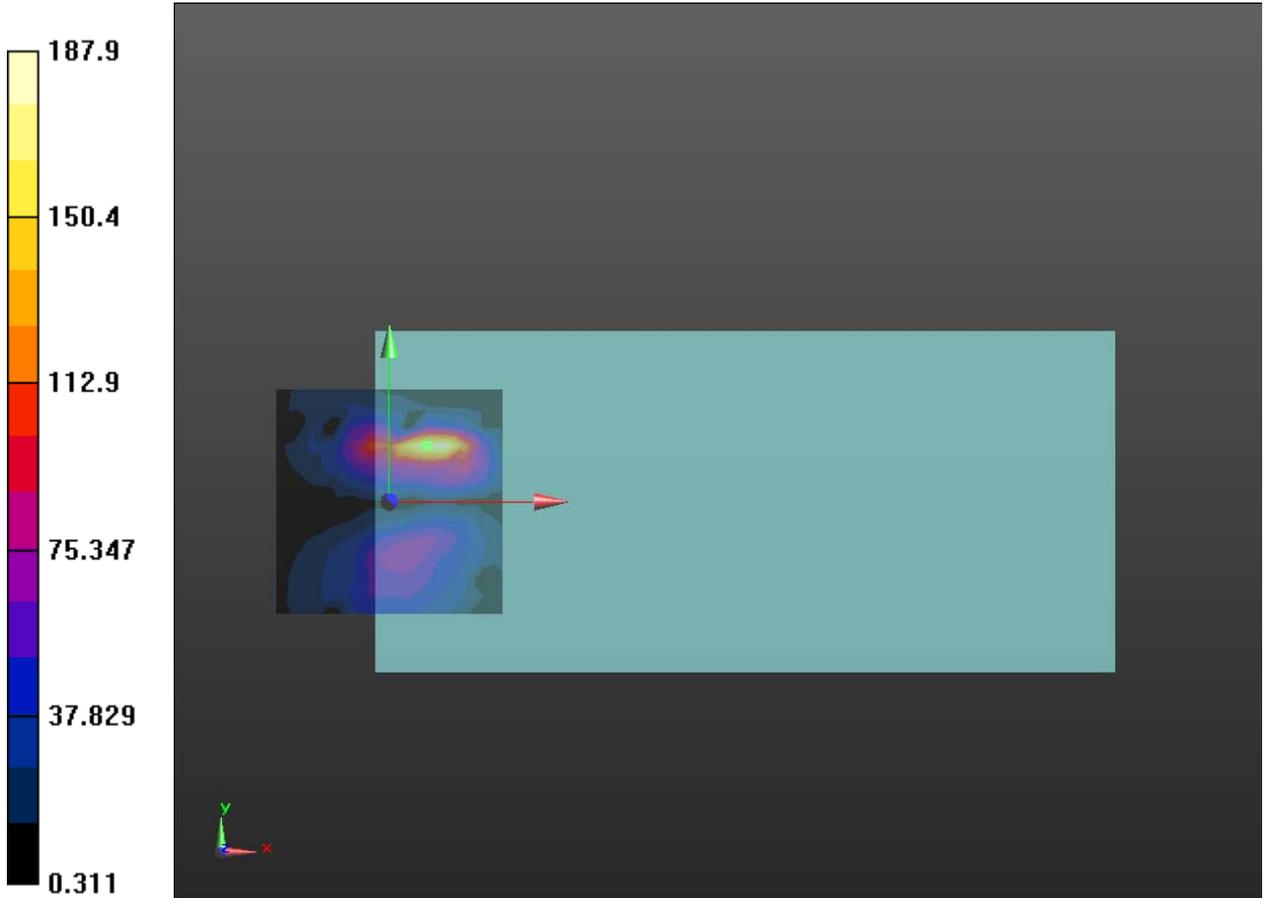
Cursor:

ABM1/ABM2 = 45.48 dB

ABM1 comp = -0.53 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, 12.5, 3.7 mm



**Plot 58 T-Coil WIFI 2.4G: 802.11b, 6kbps, Z Axial**

Date: 9/8/2020

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11b HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 37.66 dB

ABM1 comp = 5.28 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, 0, 3.7 mm

802.11b HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

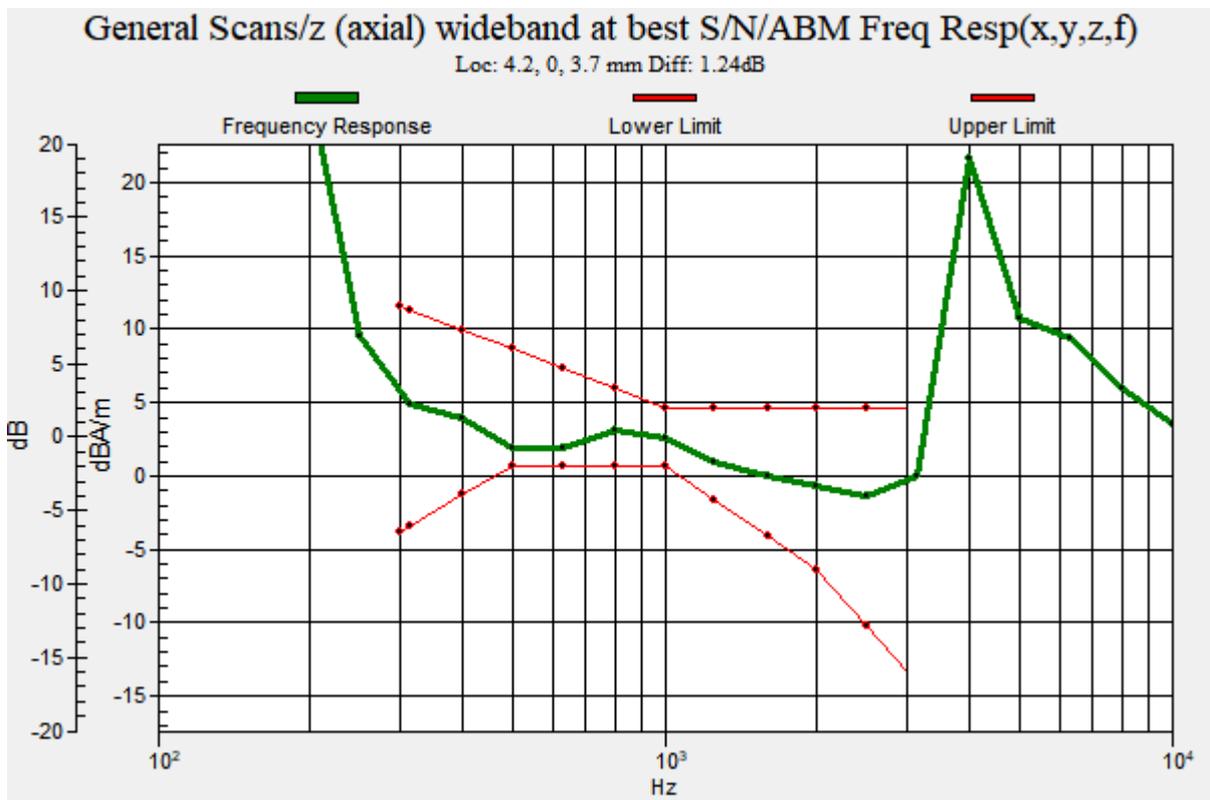
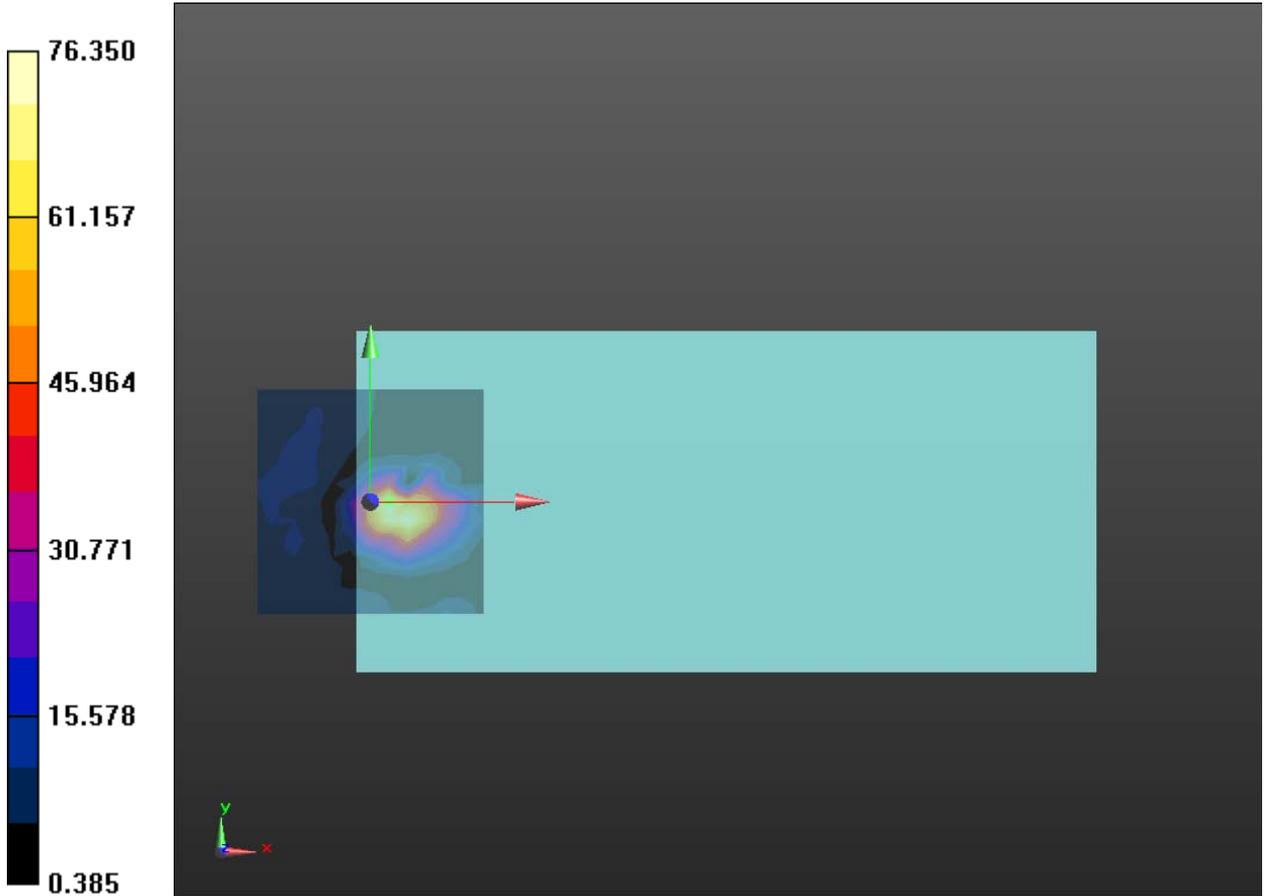
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.24 dB

BWC Factor = 10.81 dB

Location: 4.2, 0, 3.7 mm



**Plot 59 T-Coil WIFI 2.4G: 802.11g, 6kbps, Y transversal**

Date: 9/9/2020

Communication System: UID 0, 802.11g (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11g HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

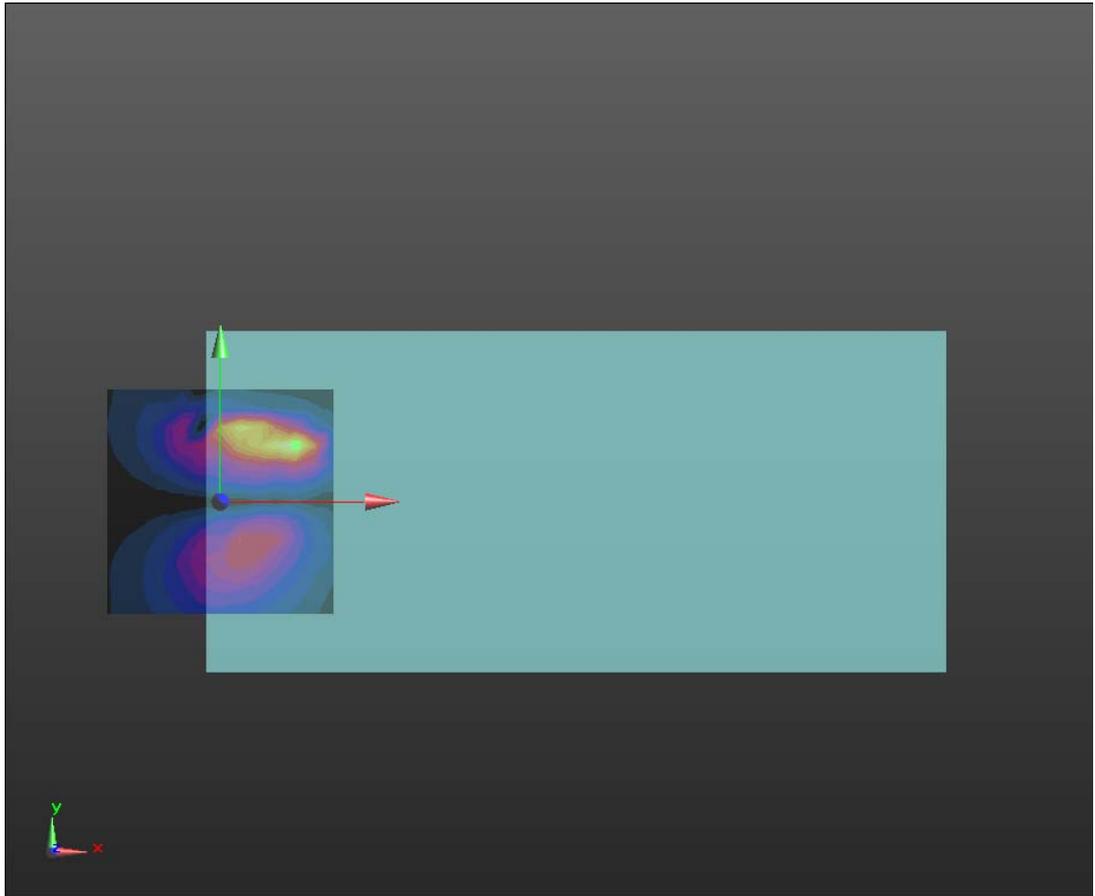
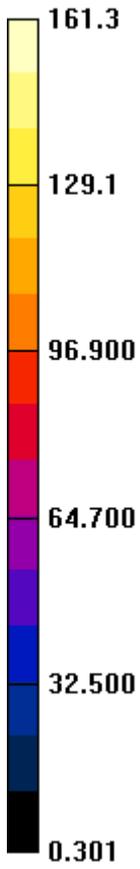
Cursor:

ABM1/ABM2 = 44.15 dB

ABM1 comp = 1.18 dBA/m

BWC Factor = 0.17 dB

Location: 16.7, 12.5, 3.7 mm



**Plot 60 T-Coil WIFI 2.4G: 802.11g, 6kbps, Z Axial**

Date: 9/9/2020

Communication System: UID 0, 802.11g (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11g HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.25 dB

ABM1 comp = 1.64 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, 4.2, 3.7 mm

802.11g HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

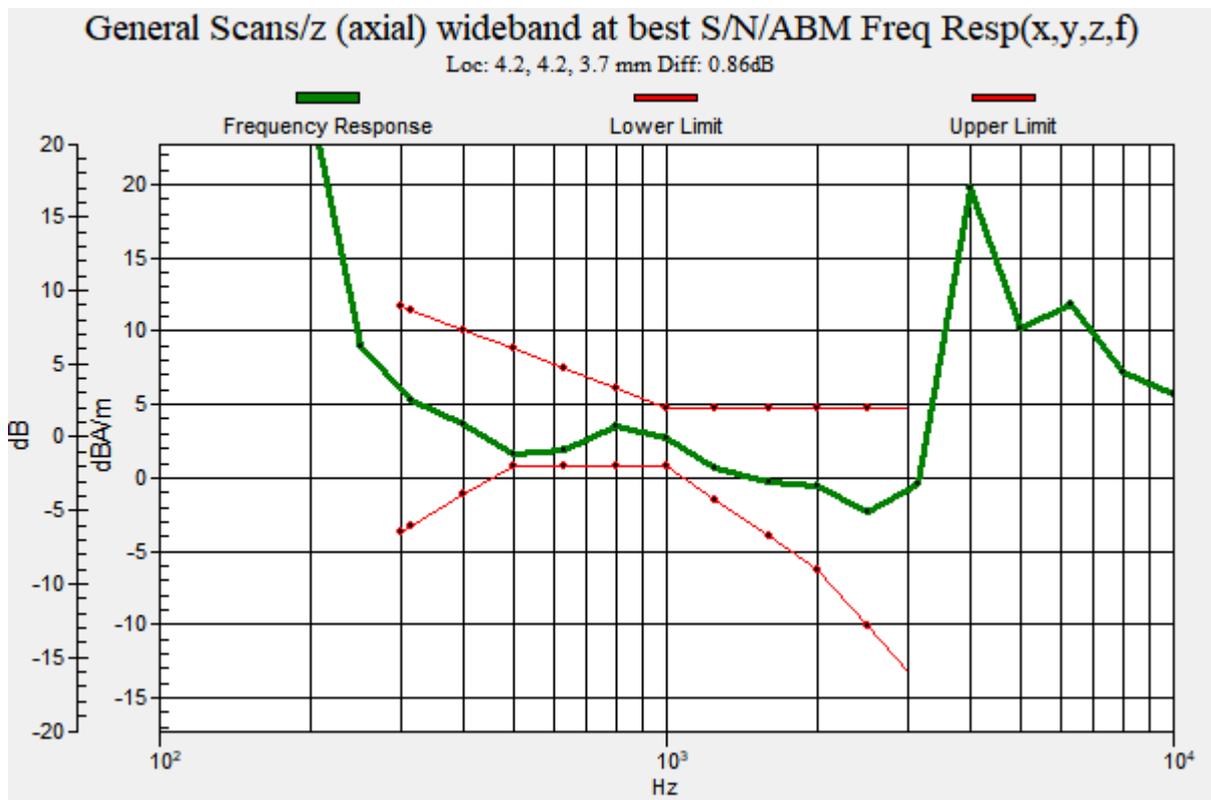
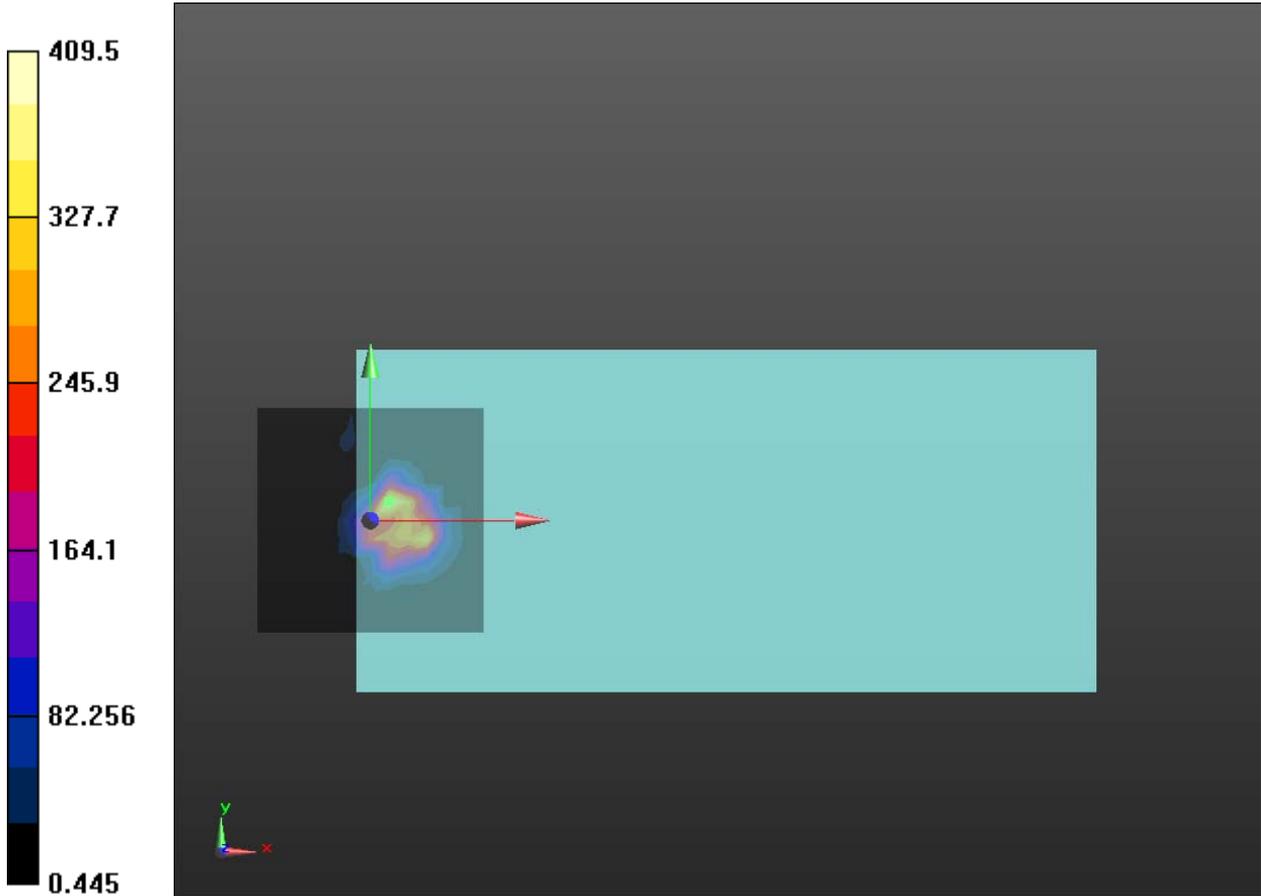
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 0.86 dB

BWC Factor = 10.81 dB

Location: 4.2, 4.2, 3.7 mm



**Plot 61 T-Coil WIFI 2.4G: 802.11n, 6kbps, Y transversal**

Date: 9/11/2020

Communication System: UID 10591 - AAB, IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle); Frequency: 2437 MHz; Duty Cycle: 1:7.29458

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11n HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

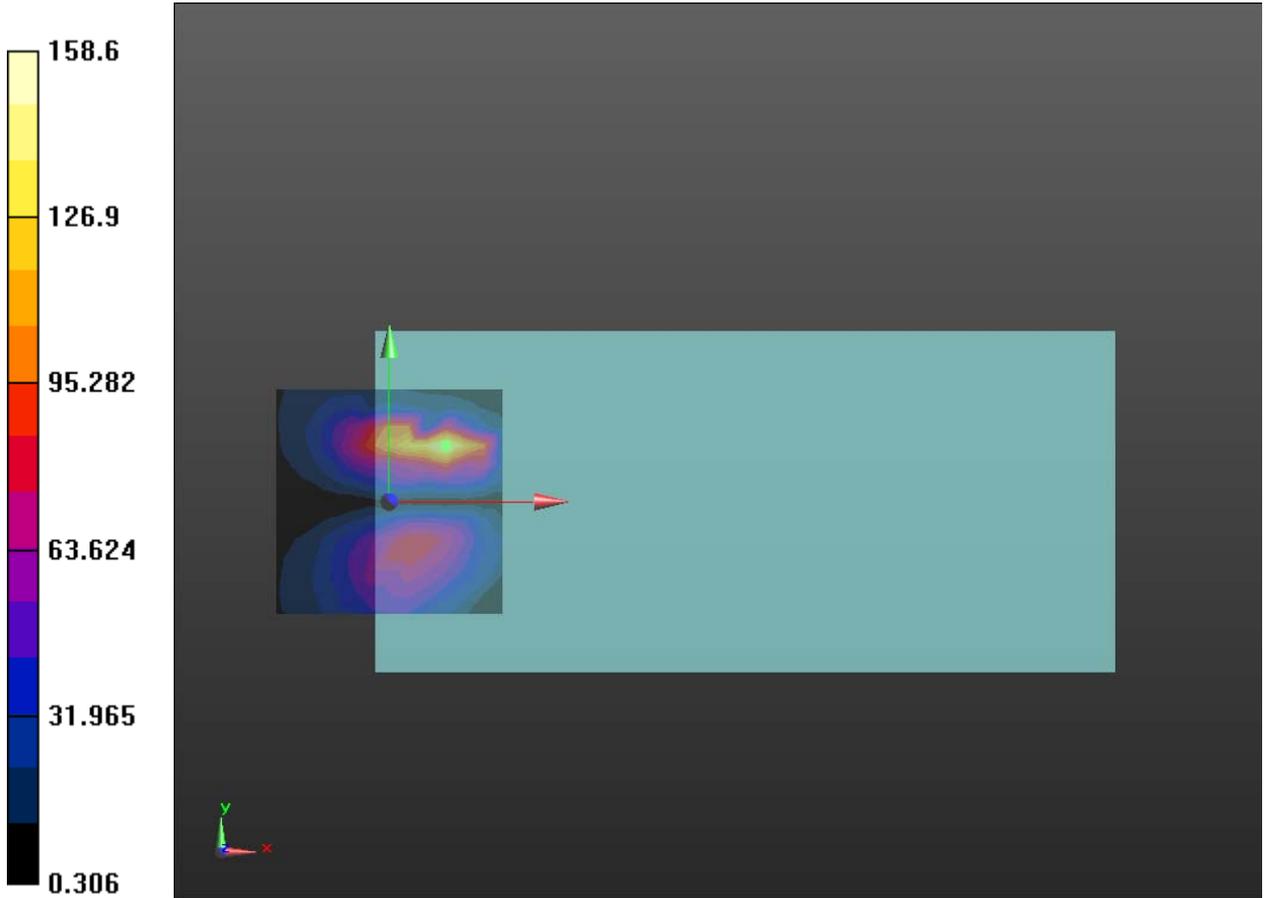
Cursor:

ABM1/ABM2 = 44.01 dB

ABM1 comp = 2.03 dBA/m

BWC Factor = 0.17 dB

Location: 12.5, 12.5, 3.7 mm



**Plot 62 T-Coil WIFI 2.4G: 802.11n, 6kbps, Z Axial**

Date: 9/11/2020

Communication System: UID 10591 - AAB, IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle); Frequency: 2437 MHz; Duty Cycle: 1:7.29458

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11n HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.34 dB

ABM1 comp = 3.66 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11n HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

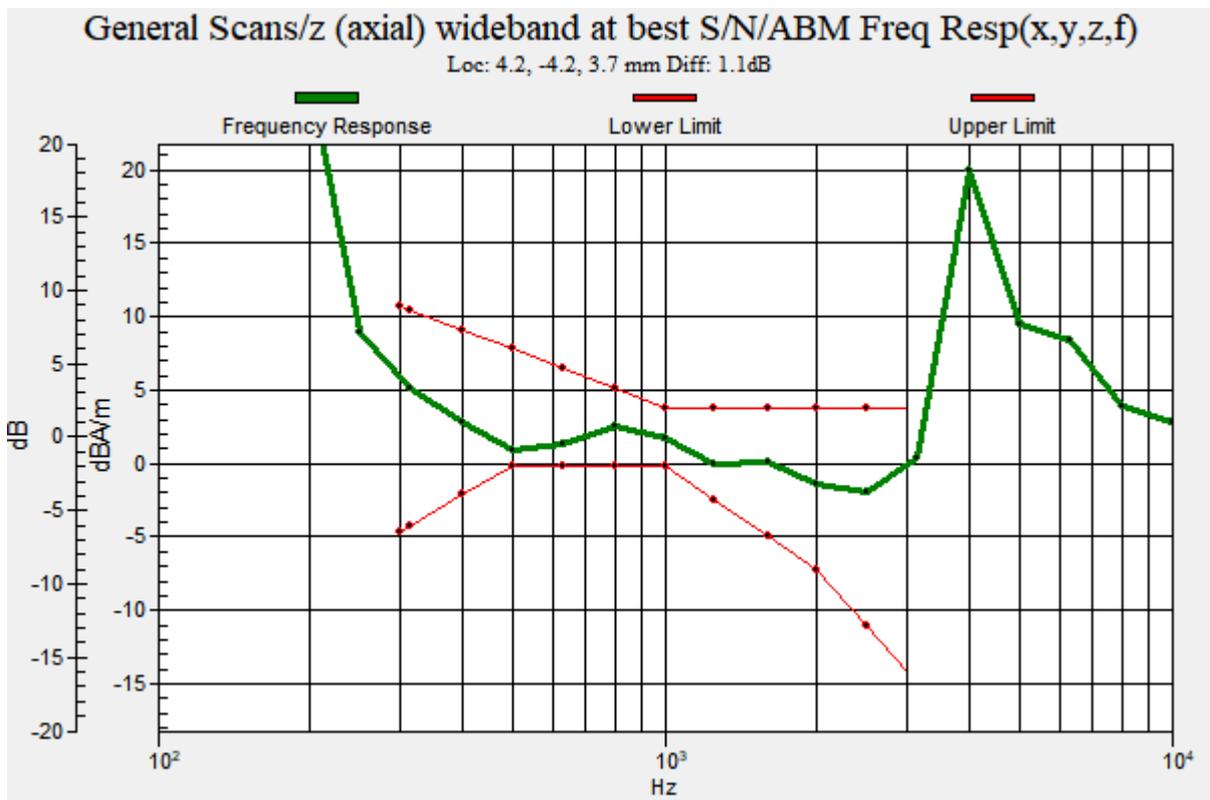
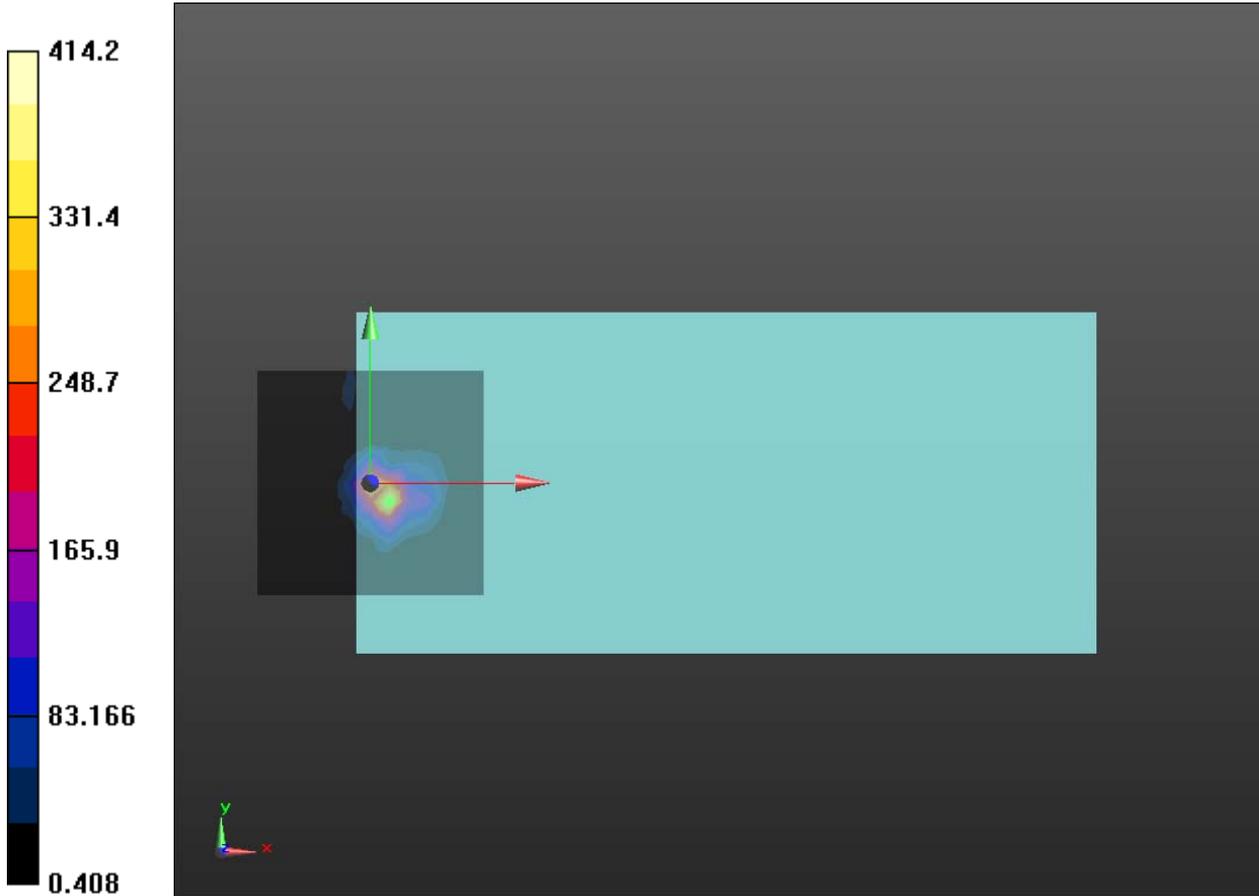
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.10 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 63 T-Coil WIFI 5G: 802.11a (U-NII-1), 6kbps, Y transversal**

Date: 9/9/2020

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

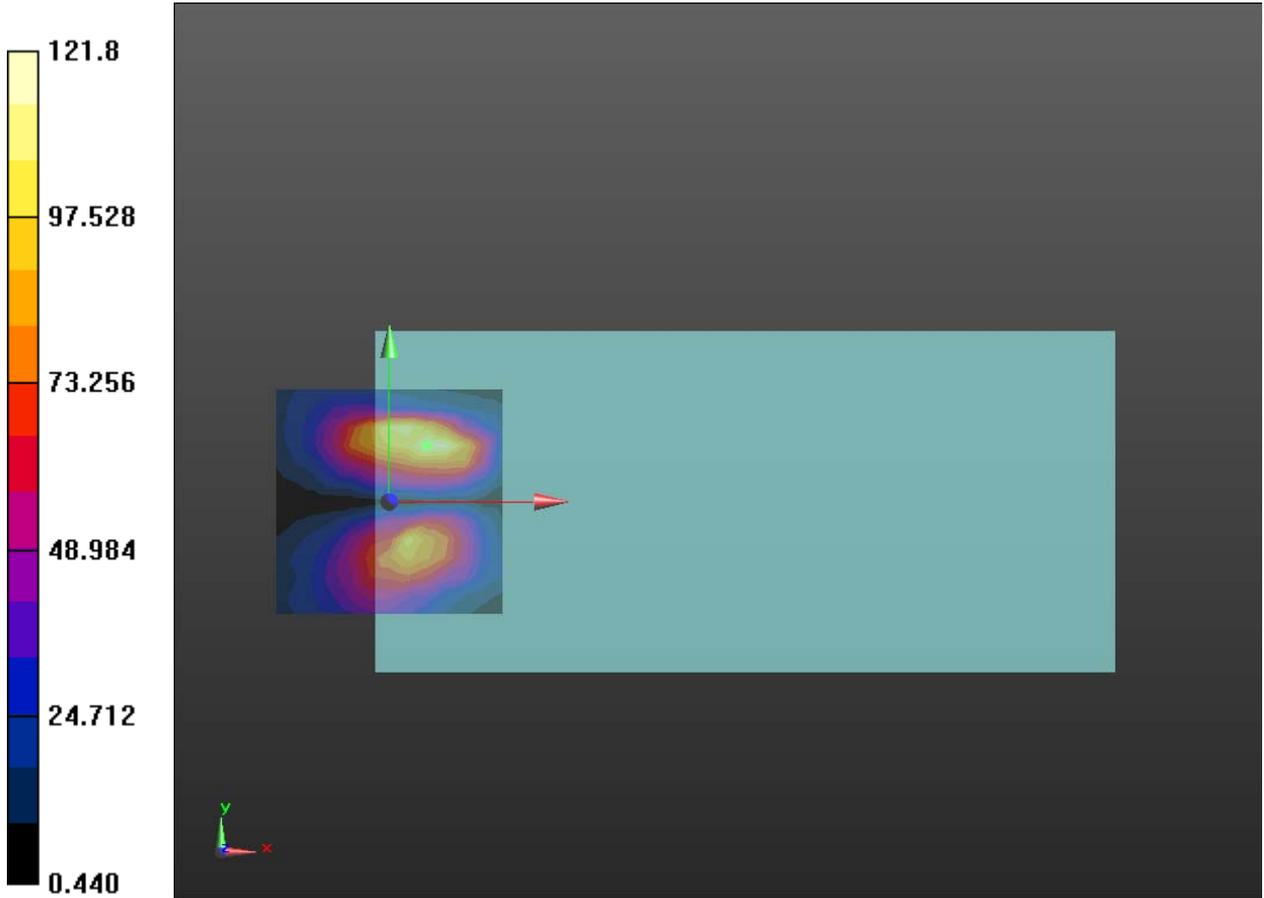
Cursor:

ABM1/ABM2 = 41.71 dB

ABM1 comp = 1.67 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, 12.5, 3.7 mm



**Plot 64 T-Coil WIFI 5G: 802.11a (U-NII-1), 6kbps, Z Axial**

Date: 9/9/2020

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.62 dB

ABM1 comp = 4.58 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, -4.2, 3.7 mm

802.11a HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

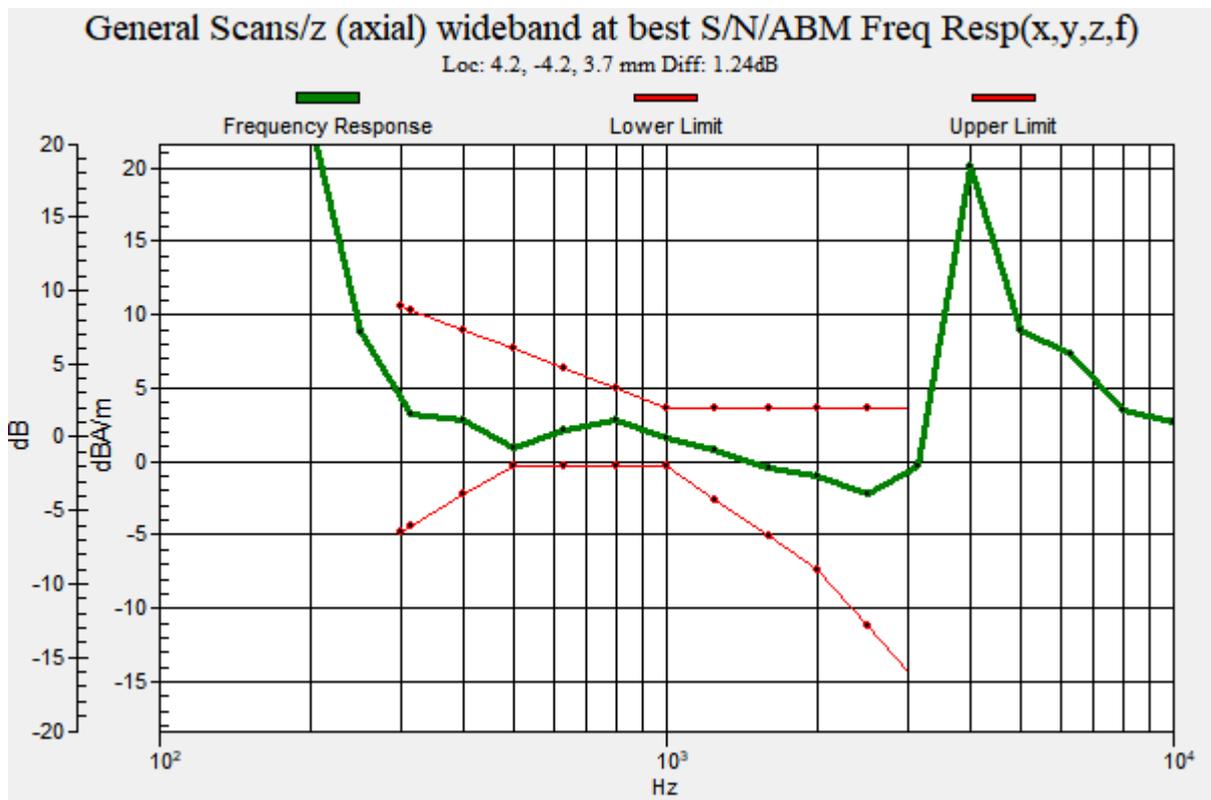
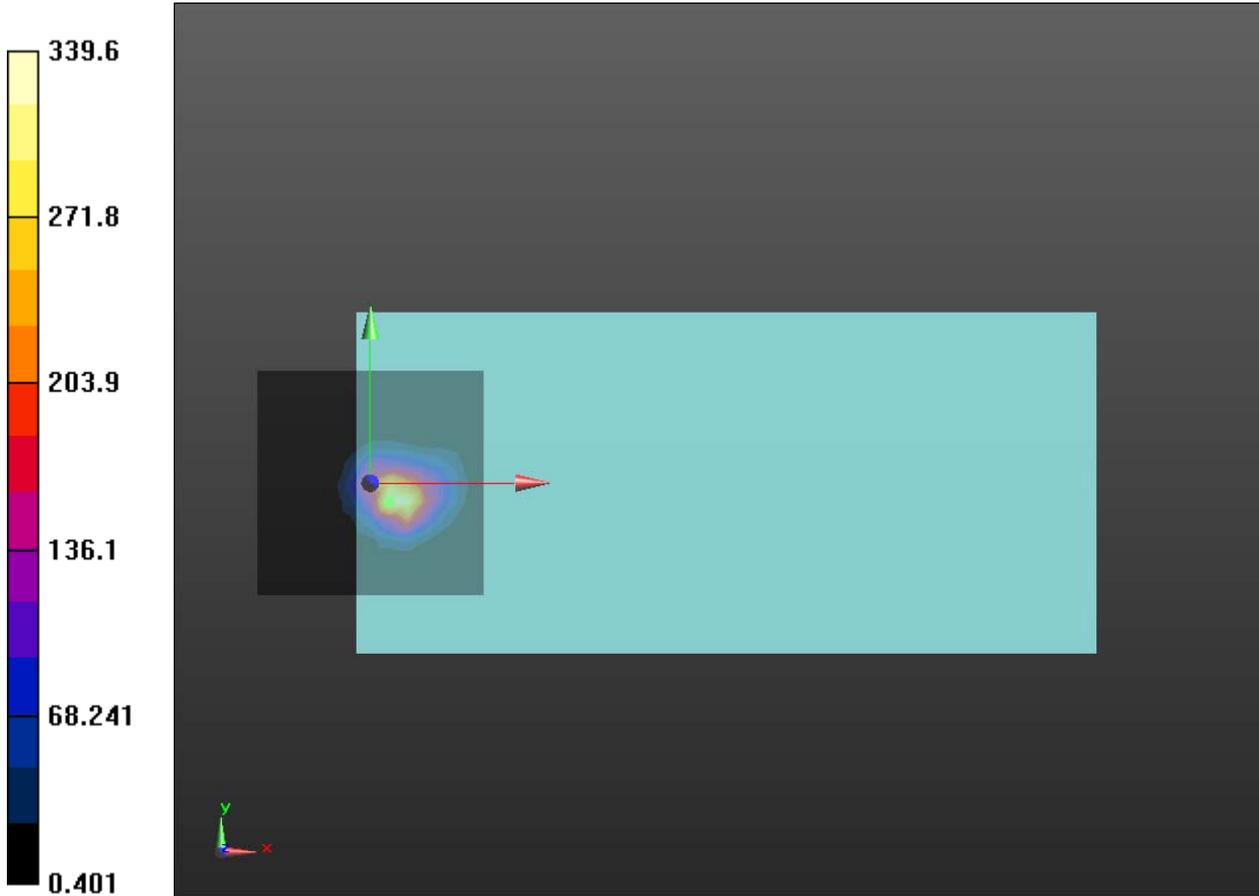
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.24 dB

BWC Factor = 10.81 dB

Location: 4.2, -4.2, 3.7 mm



**Plot 65 T-Coil WIFI 5G: 802.11a (U-NII-3), 6kbps, Y transversal**

Date: 9/11/2020

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_OTT_WD_Emission/General Scans/y (transversal) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

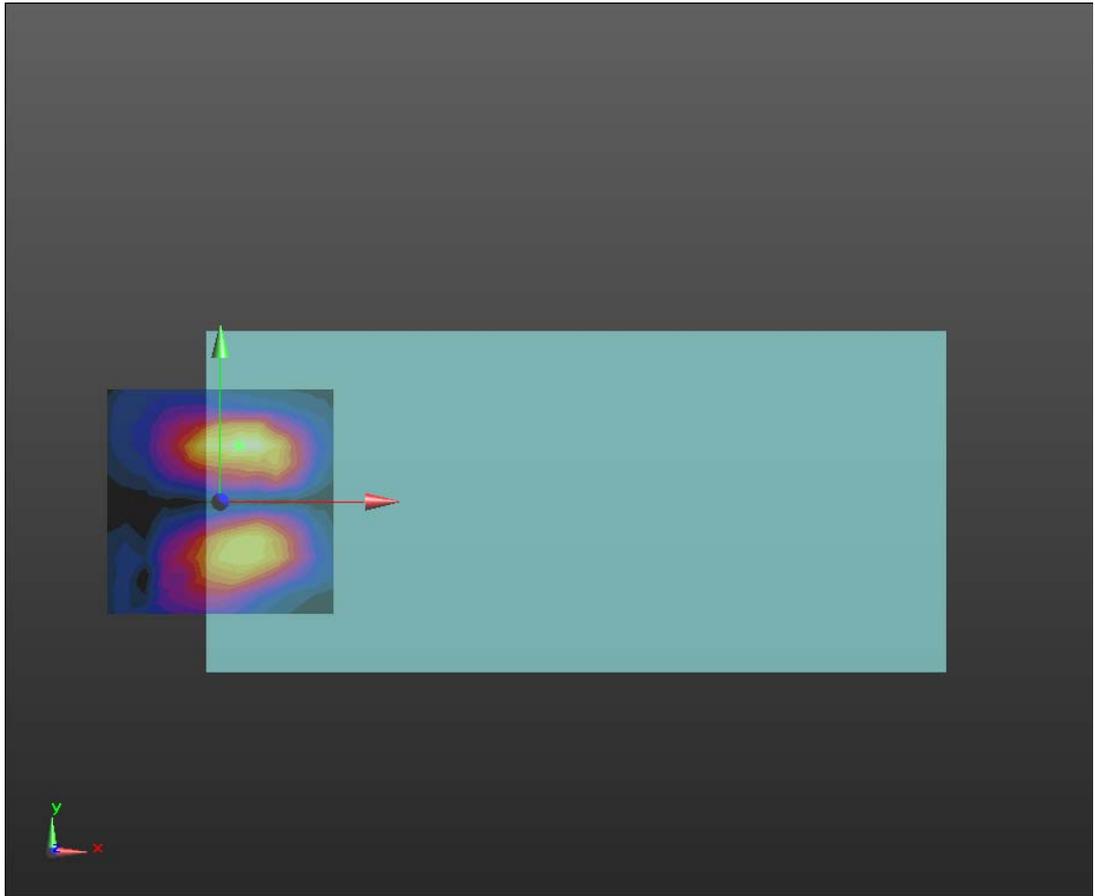
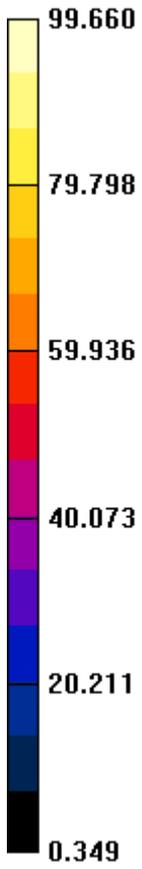
Cursor:

ABM1/ABM2 = 39.97 dB

ABM1 comp = -1.61 dBA/m

BWC Factor = 0.17 dB

Location: 4.2, 12.5, 3.7 mm



**Plot 66 T-Coil WIFI 5G: 802.11a (U-NII-3), 6kbps, Z Axial**

Date: 9/11/2020

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: TCoil Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: AM1DV3 - 3082; ; Calibrated: 2/27/2020

Electronics: DAE4 Sn1291; Calibrated: 2/24/2020

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.12 (7470)

802.11a HAC_OTT_WD_Emission/General Scans/z (axial) 4.2mm 50 x 50/ABM SNR(x,y,z)**(13x13x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_1kHz_1s.wav

Output Gain: 29.07

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.17 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 49.09 dB

ABM1 comp = 7.84 dBA/m

BWC Factor = 0.17 dB

Location: 8.3, -4.2, 3.7 mm

802.11a HAC_OTT_WD_Emission/General Scans/z (axial) wideband at best S/N/ABM Freq**Resp(x,y,z,f) (1x1x1)**: Measurement grid: dx=10mm, dy=10mm

Signal Type: Audio File (.wav) 48k_voice_300-3000_2s.wav

Output Gain: 71.94

Measure Window Start: 300ms

Measure Window Length: 2000ms

BWC applied: 10.81 dB

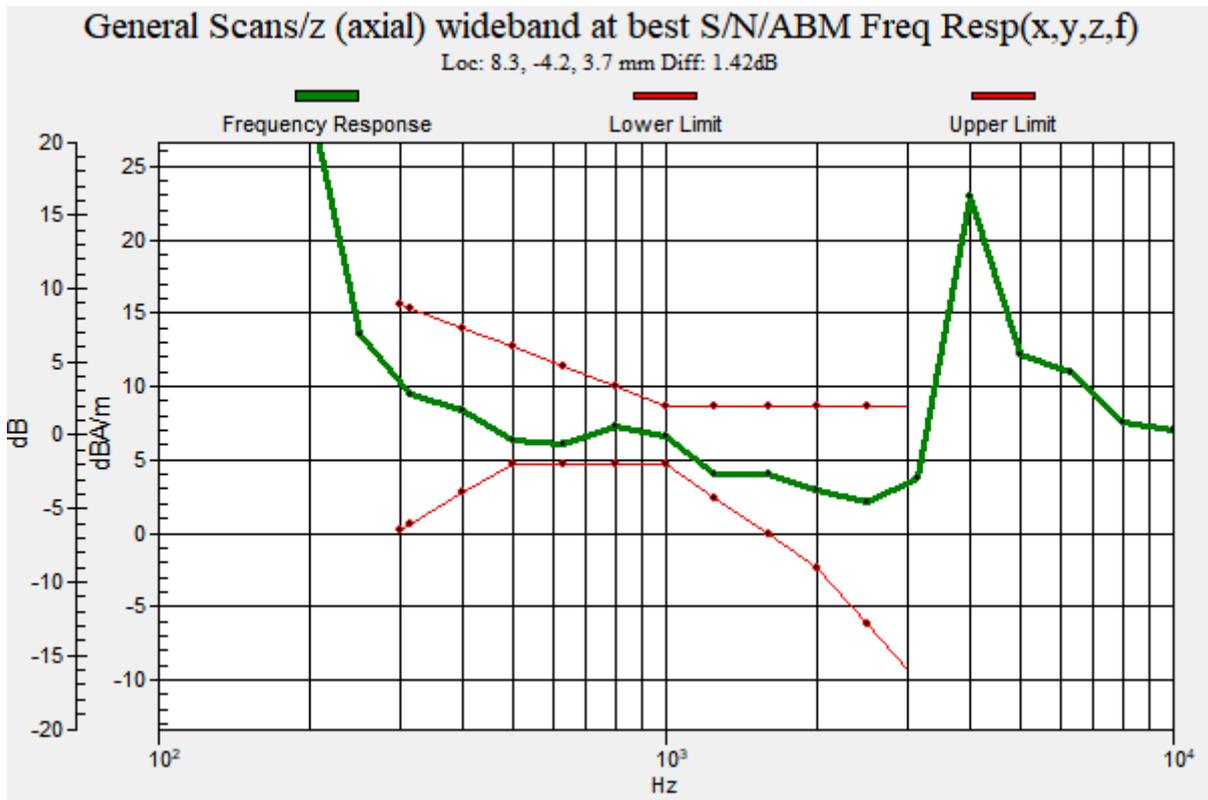
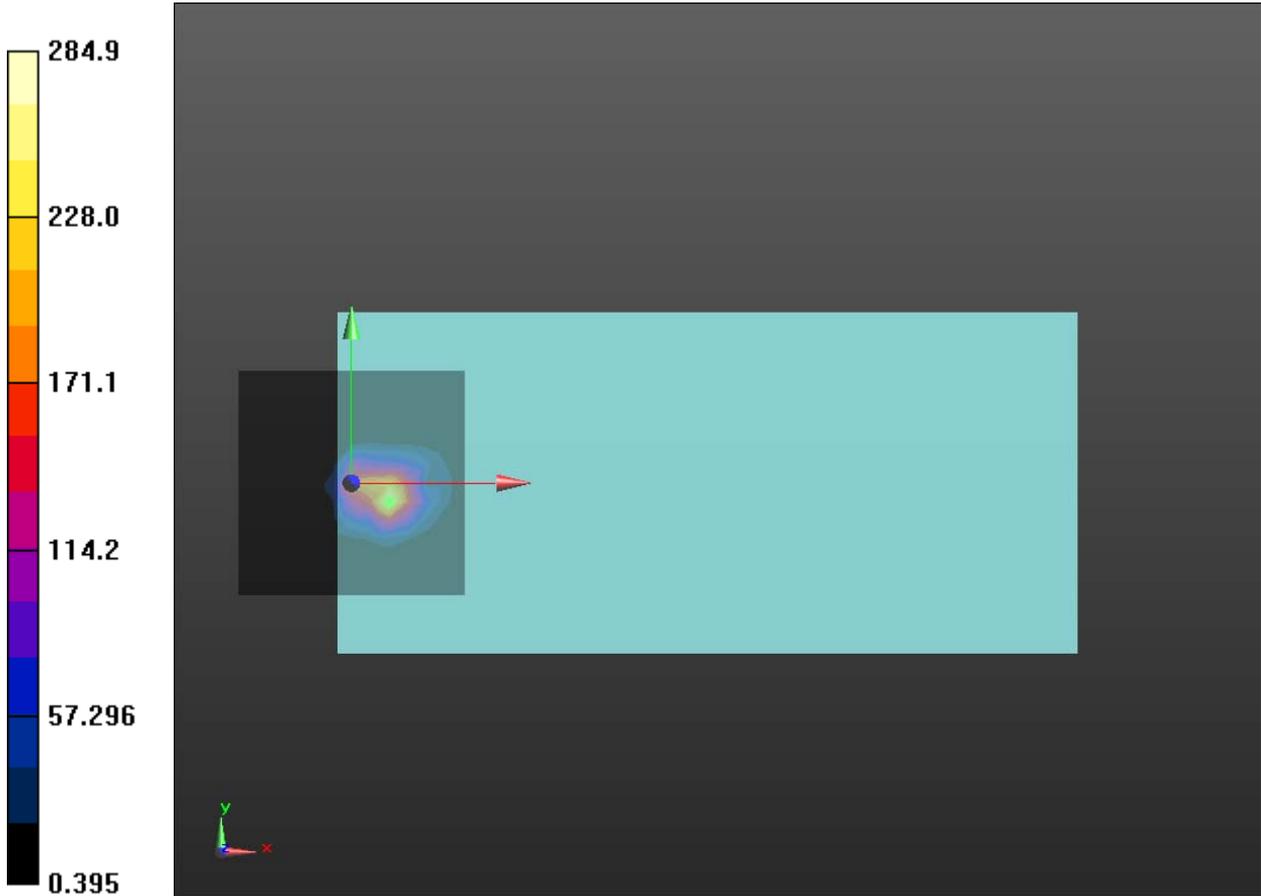
Device Reference Point: 0, 0, -6.3 mm

Cursor:

Diff = 1.42 dB

BWC Factor = 10.81 dB

Location: 8.3, -4.2, 3.7 mm





ANNEX C: Probe Calibration Certificate

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S 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 0108

Client **TA-SH (Auden)**

Certificate No: **AM1DV3-3082_Feb20**

CALIBRATION CERTIFICATE			
Object	AM1DV3 - SN: 3082		
Calibration procedure(s)	QA CAL-24.v4 Calibration procedure for AM1D magnetic field probes and TMFS in the audio range		
Calibration date:	February 27, 2020		
<p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p>			
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	03-Sep-19 (No. 25949)	Sep-20
Reference Probe AM1DV2	SN: 1008	10-Dec-19 (No. AM1DV2-1008_Dec19)	Dec-20
DAE4	SN: 781	27-Dec-19 (No. DAE4-781_Dec19)	Dec-20
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
AMCC	SN: 1050	01-Oct-13 (in house check Oct-17)	Oct-20
AMMI Audio Measuring Instrument	SN: 1062	26-Sep-12 (in house check Oct-17)	Oct-20
Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature
			Issued: February 27, 2020
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

[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	AM1DV3 Audio Magnetic 1D Field Probe
Type No	SP AM1 001 BA
Serial No	3082

Overall length	296 mm
Tip diameter	6.0 mm (at the tip)
Sensor offset	3.0 mm (centre of sensor from tip)
Internal Amplifier	20 dB

Manufacturer / Origin	Schmid & Partner Engineering AG, Zurich, Switzerland
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Calibration data

Connector rotation angle	(in DASY system)	8.6 °	+/- 3.6 ° (k=2)
Sensor angle	(in DASY system)	0.39 °	+/- 0.5 ° (k=2)
Sensitivity at 1 kHz	(in DASY system)	0.00739 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 D: DAE4 Calibration Certificate



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn



中国认可
国际互认
校准
CALIBRATION
CNAS L0570

Client : TA(Shanghai)

Certificate No: Z20-60078

CALIBRATION CERTIFICATE

Object DAE4 - SN: 1291

Calibration Procedure(s)
FF-Z11-002-01
Calibration Procedure for the Data Acquisition Electronics (DAEx)

Calibration date: February 24, 2020

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%.

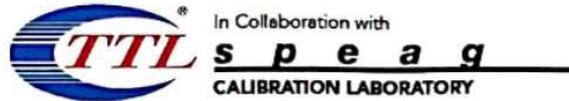
Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	24-Jun-19 (CTTL, No.J19X05126)	Jun-20

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: February 26, 2020

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



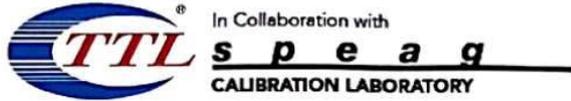
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Glossary:

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.



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DC Voltage Measurement

A/D - Converter Resolution nominal
High Range: 1LSB = 6.1µV, full range = -100...+300 mV
Low Range: 1LSB = 61nV, full range = -1.....+3mV
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Table with 4 columns: Calibration Factors, X, Y, Z. Rows include High Range and Low Range with their respective values and uncertainties.

Connector Angle

Table with 2 columns: Connector Angle to be used in DASY system, 166.5° ± 1°