

Appendix A. Plots of HAC T-Coil Measurement

The HAC plots for worst-case in each wireless mode and frequency band combination are shown as follows.

Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P01 T-Coil_LTE 2_QPSK20M_Ch18900_1RB_OS0_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

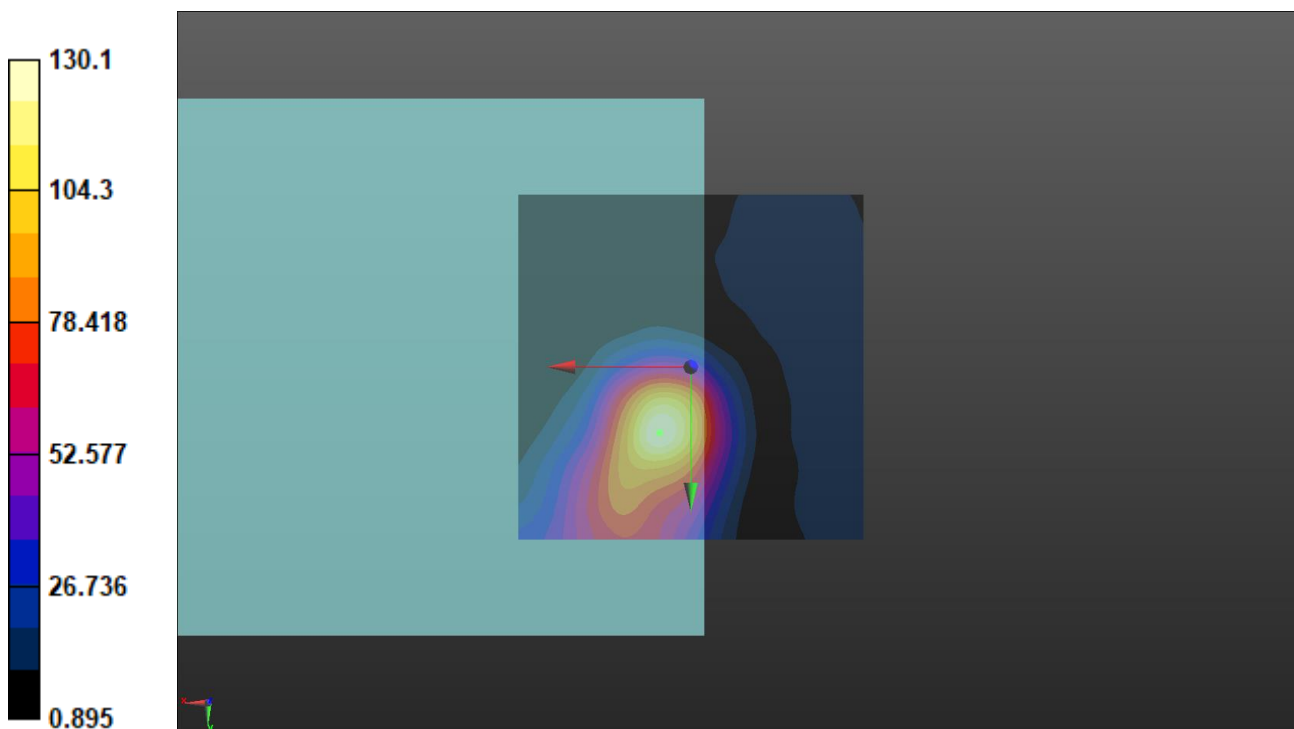
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 42.29 dB

ABM1 comp = 0.71 dBA/m

Location: 4.5, 9.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P01 T-Coil_LTE 2_QPSK20M_Ch18900_1RB_OS0_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

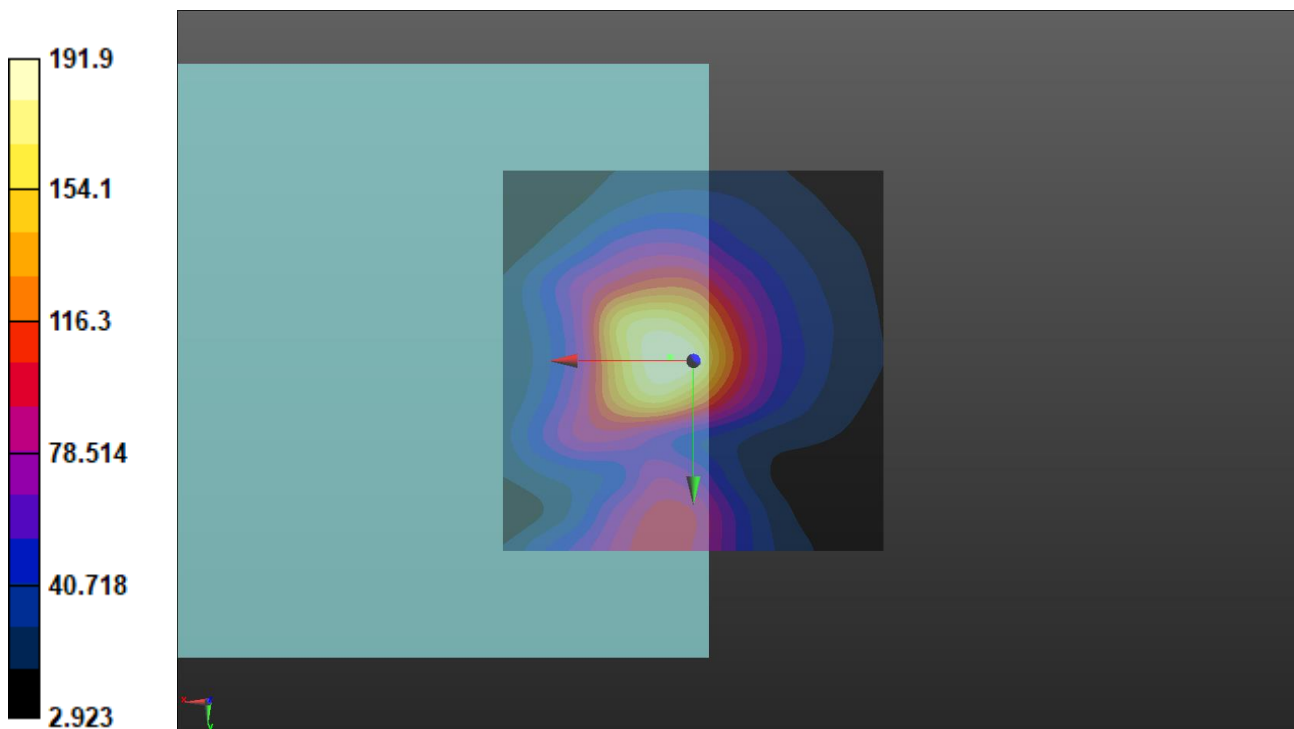
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 45.66 dB

ABM1 comp = -7.00 dBA/m

Location: 3, -0.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P01 T-Coil_LTE 2_QPSK20M_Ch18900_1RB_OS0_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz; Duty Cycle: 1:3.74

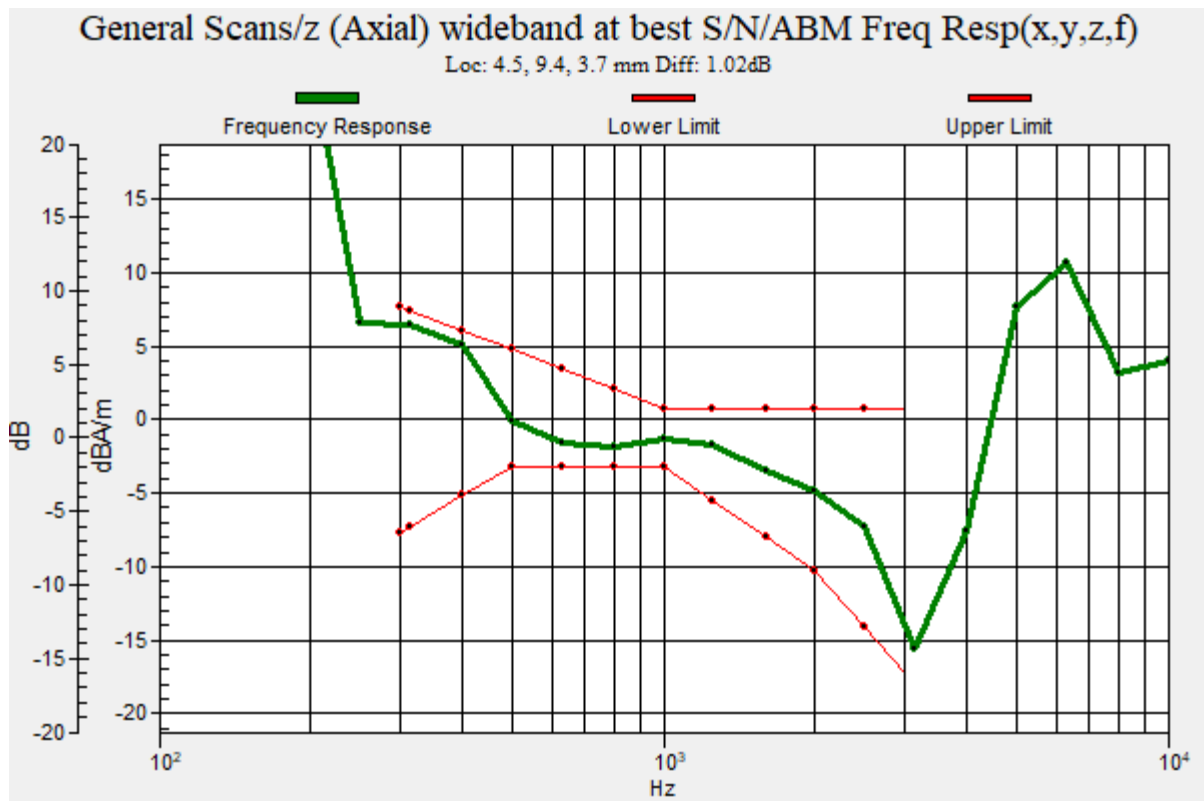
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.6 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P02 T-Coil_LTE 4_QPSK20M_Ch20175_1RB_OS0_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

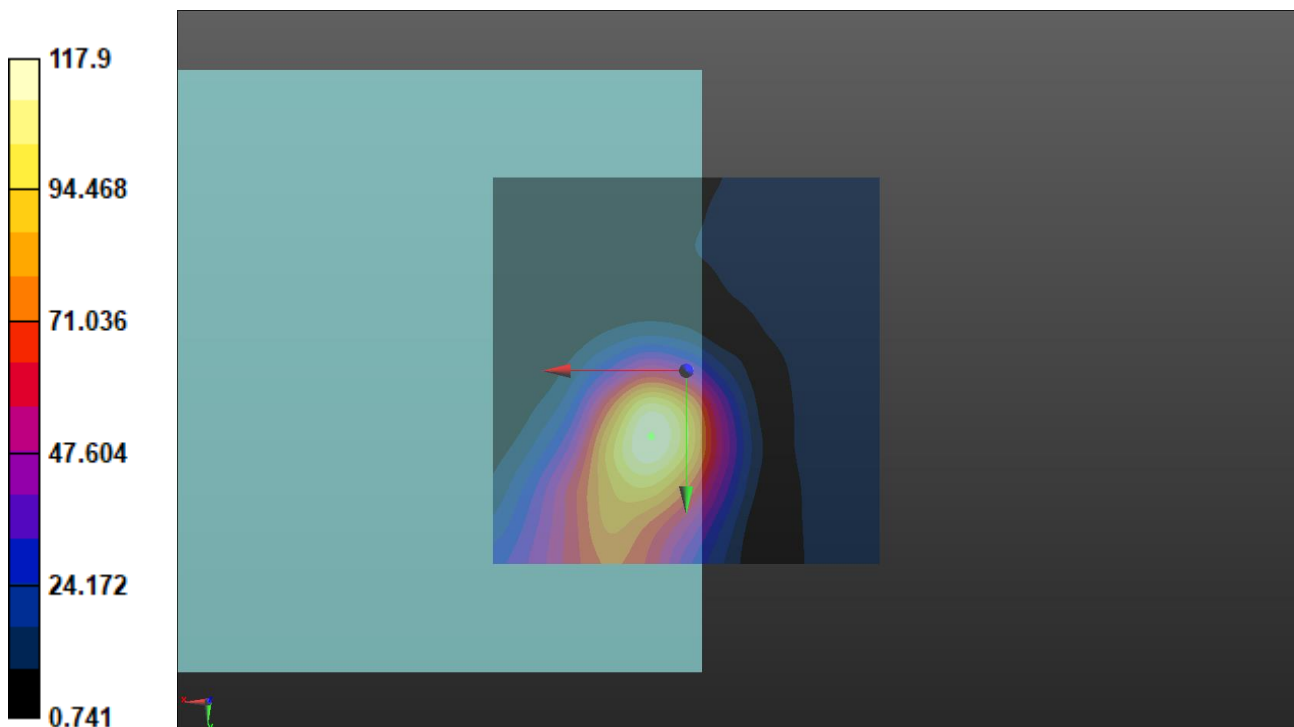
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 41.43 dB

ABM1 comp = 0.29 dBA/m

Location: 4.5, 8.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P02 T-Coil_LTE 4_QPSK20M_Ch20175_1RB_OS0_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

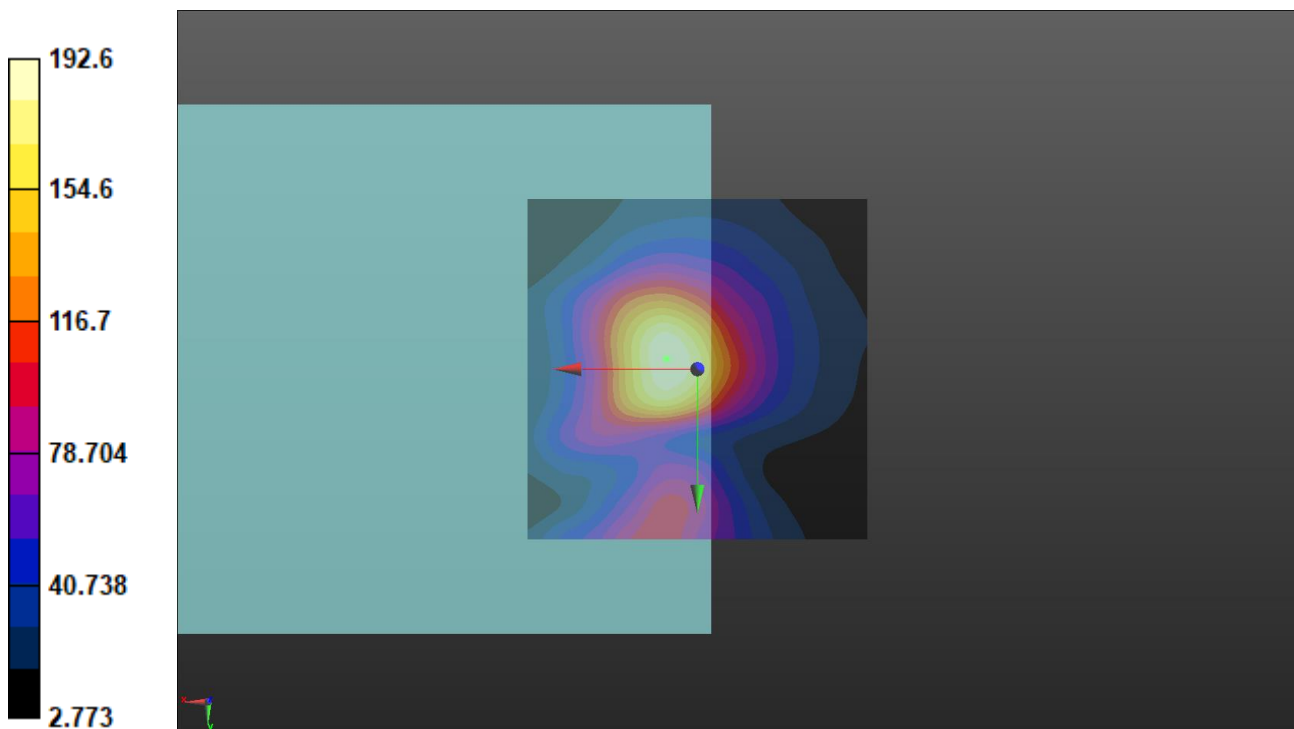
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 45.70 dB

ABM1 comp = -6.61 dBA/m

Location: 4.5, -1.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P02 T-Coil_LTE 4_QPSK20M_Ch20175_1RB_OS0_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1732.5 MHz; Duty Cycle: 1:3.74

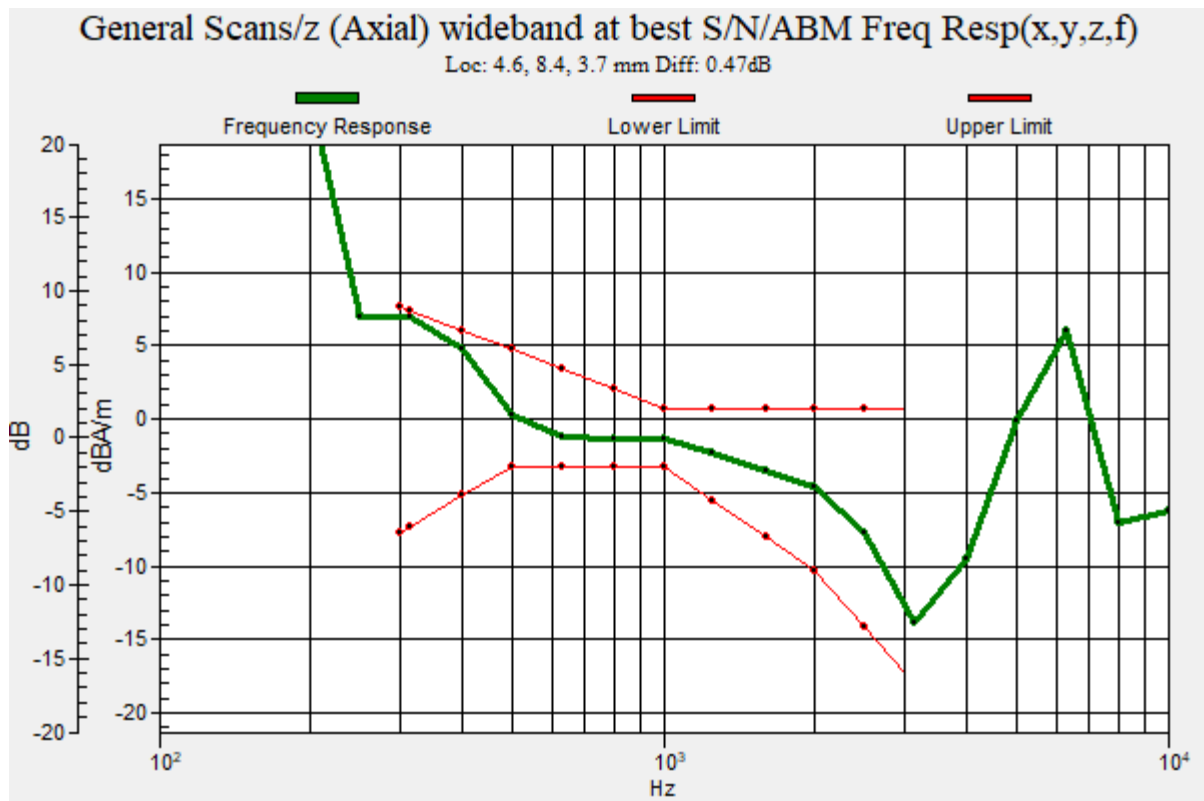
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.6 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P03 T-Coil_LTE 5_QPSK10M_Ch20525_1RB_OS0_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 836.5 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

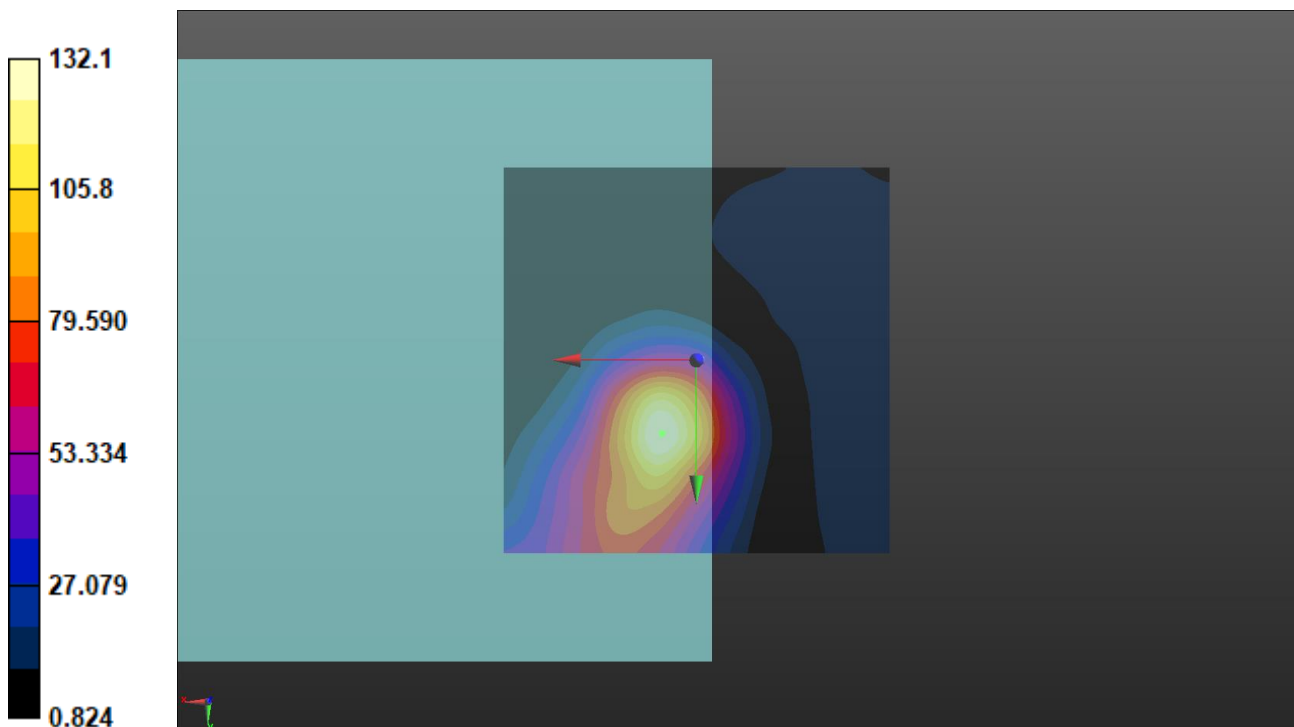
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 42.42 dB

ABM1 comp = 0.50 dBA/m

Location: 4.5, 9.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P03 T-Coil_LTE 5_QPSK10M_Ch20525_1RB_OS0_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 836.5 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

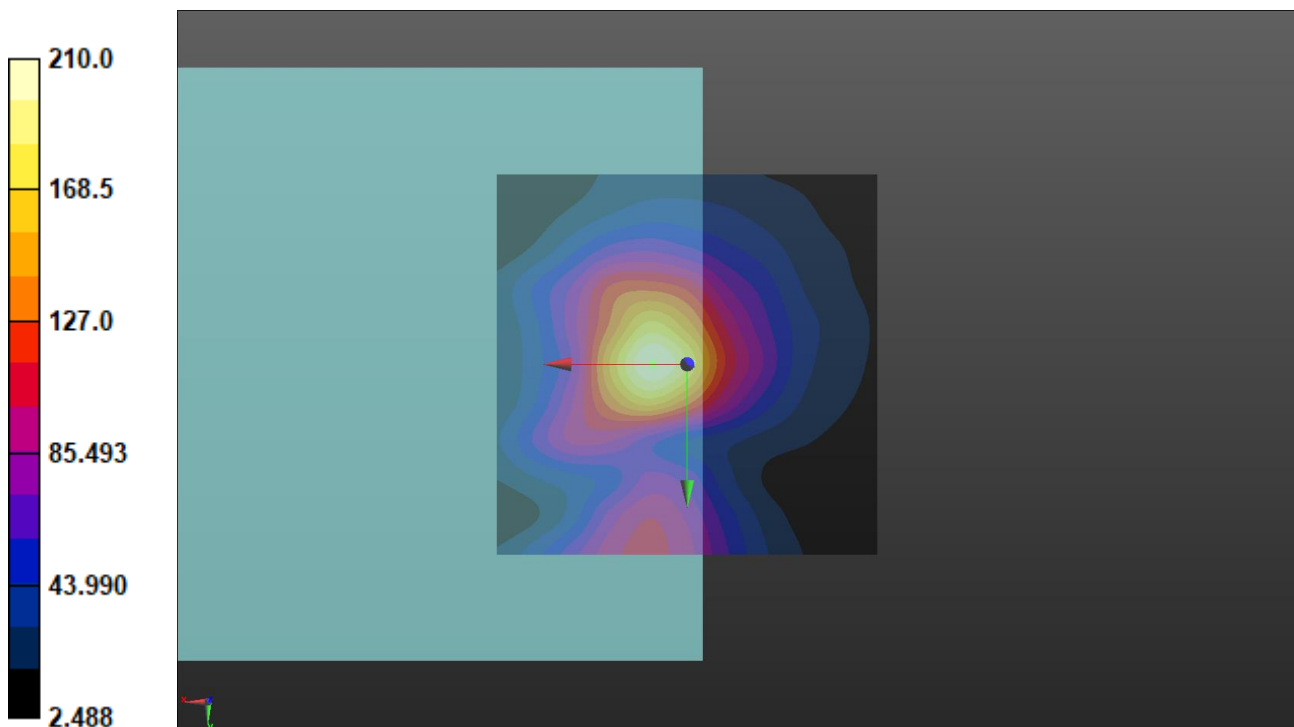
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 46.44 dB

ABM1 comp = -5.63 dBA/m

Location: 4.5, 0, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P03 T-Coil_LTE 5_QPSK10M_Ch20525_1RB_OS0_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 836.5 MHz; Duty Cycle: 1:3.74

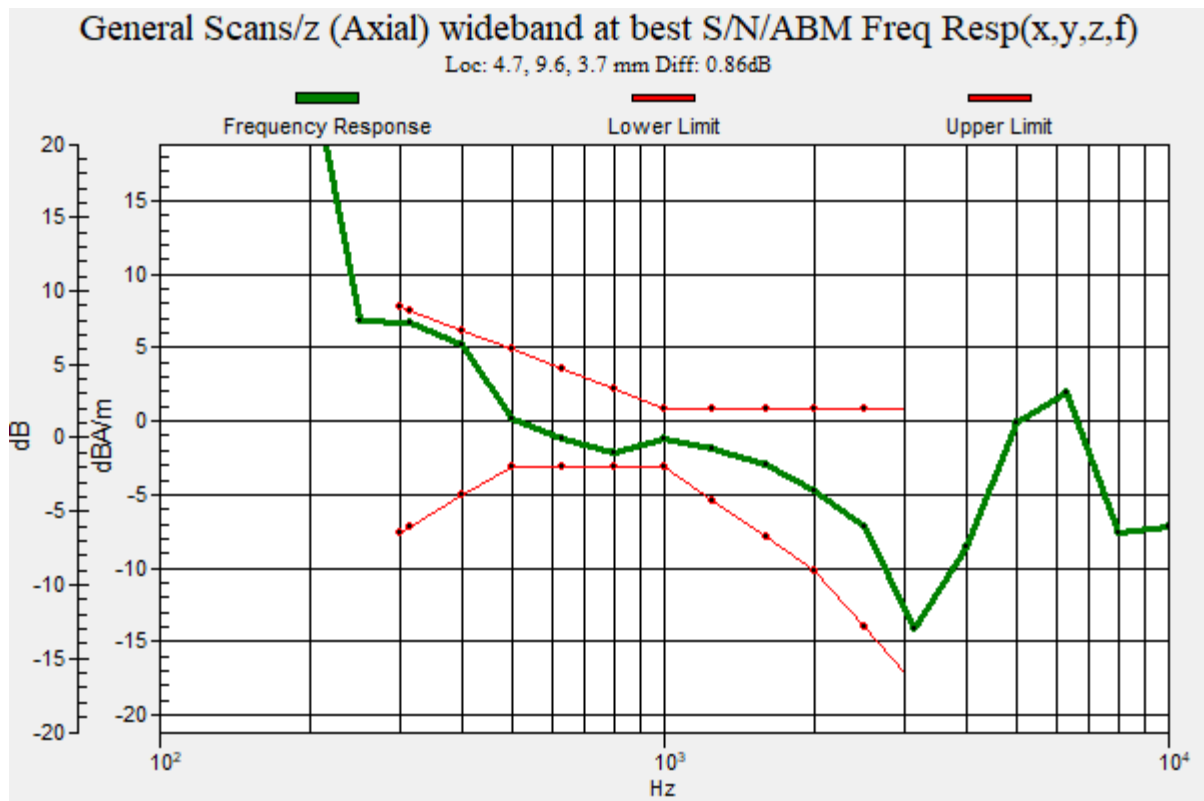
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.6 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P04 T-Coil_LTE 12_QPSK10M_Ch23095_1RB_OS0_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 707.5 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

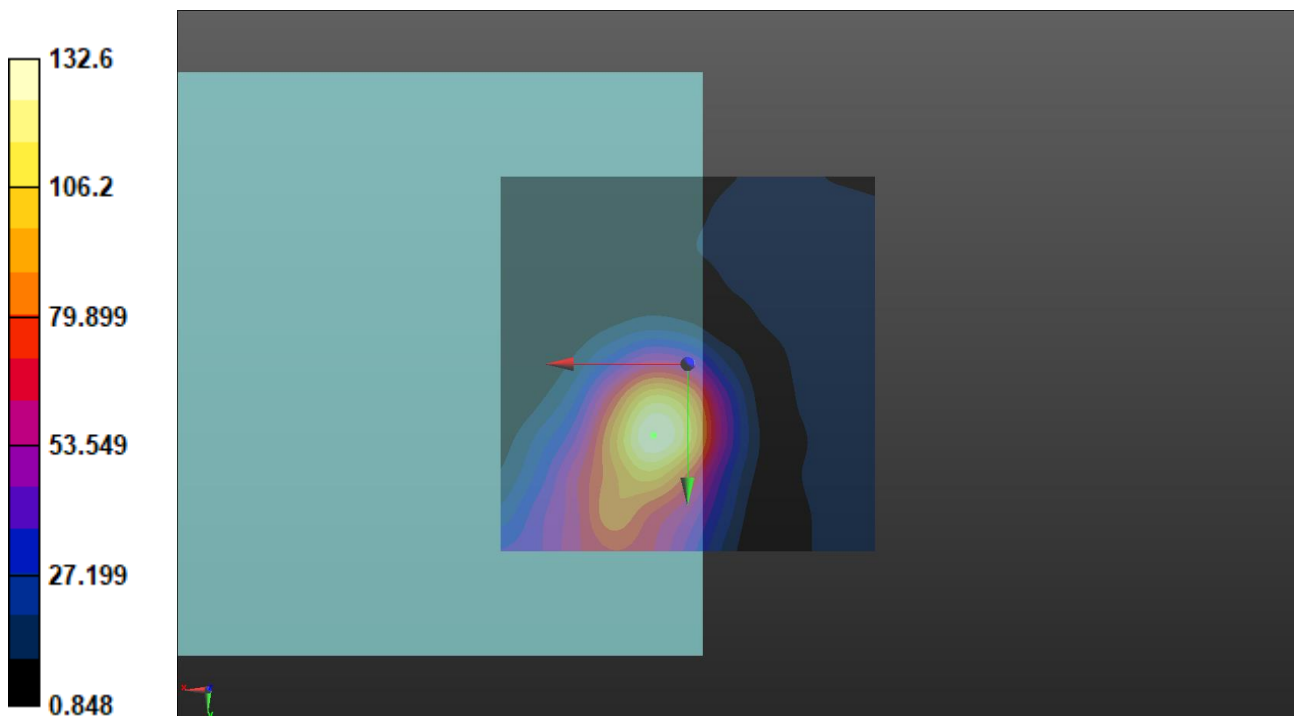
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 42.45 dB

ABM1 comp = 0.50 dBA/m

Location: 4.5, 9.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P04 T-Coil_LTE 12_QPSK10M_Ch23095_1RB_OS0_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 707.5 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

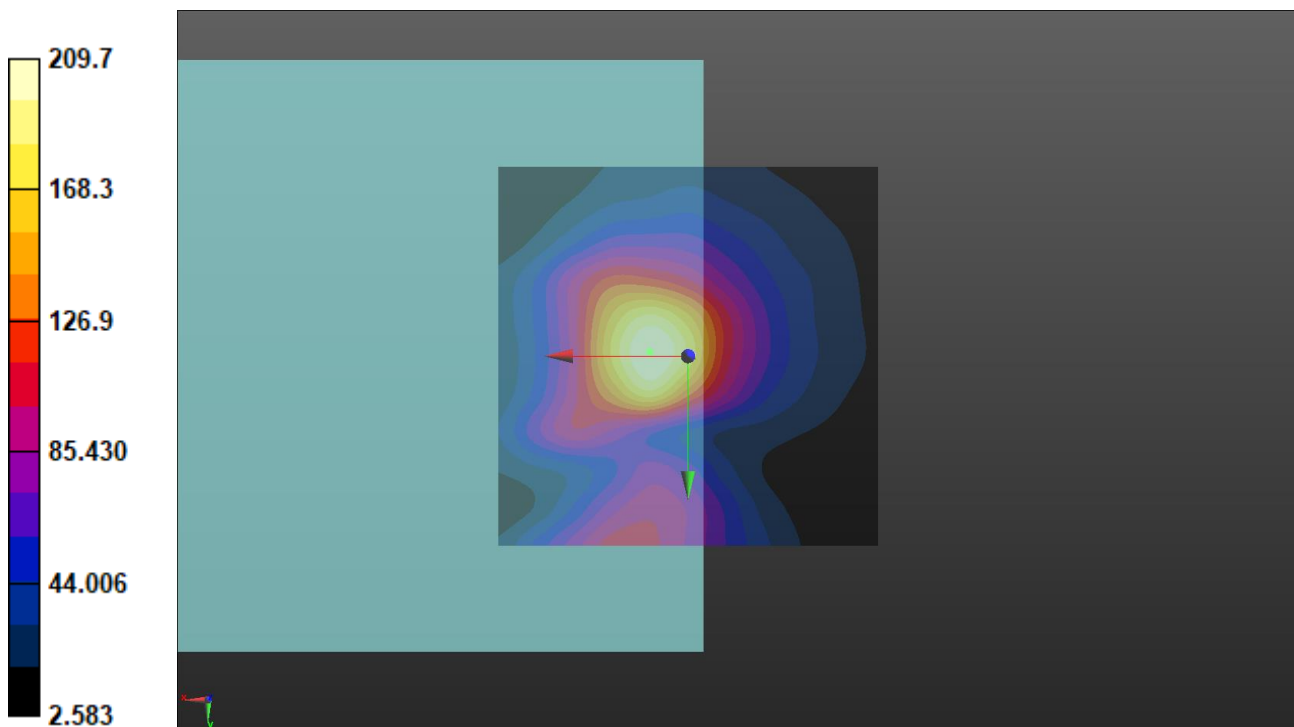
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 46.43 dB

ABM1 comp = -6.02 dBA/m

Location: 5, -0.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P04 T-Coil_LTE 12_QPSK10M_Ch23095_1RB_OS0_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 707.5 MHz; Duty Cycle: 1:3.74

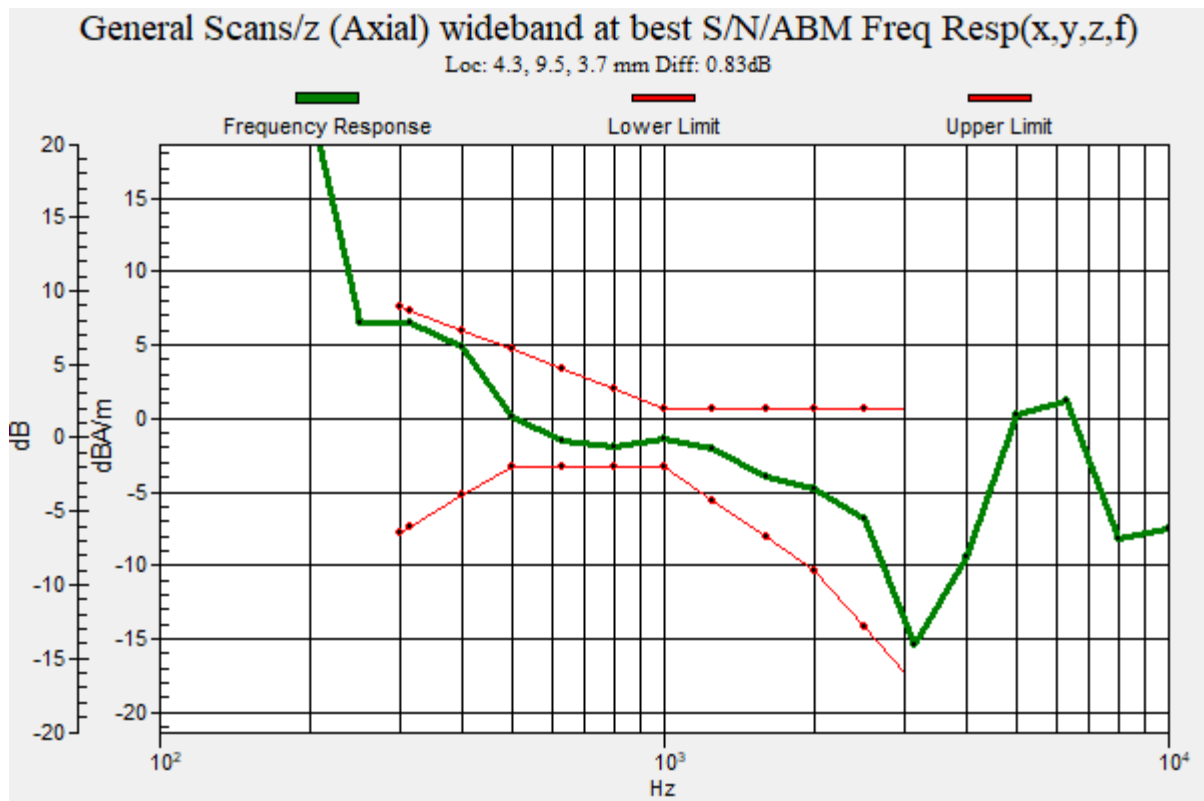
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.6 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P05 T-Coil_LTE 13_QPSK10M_Ch23230_1RB_OS0_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 782 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

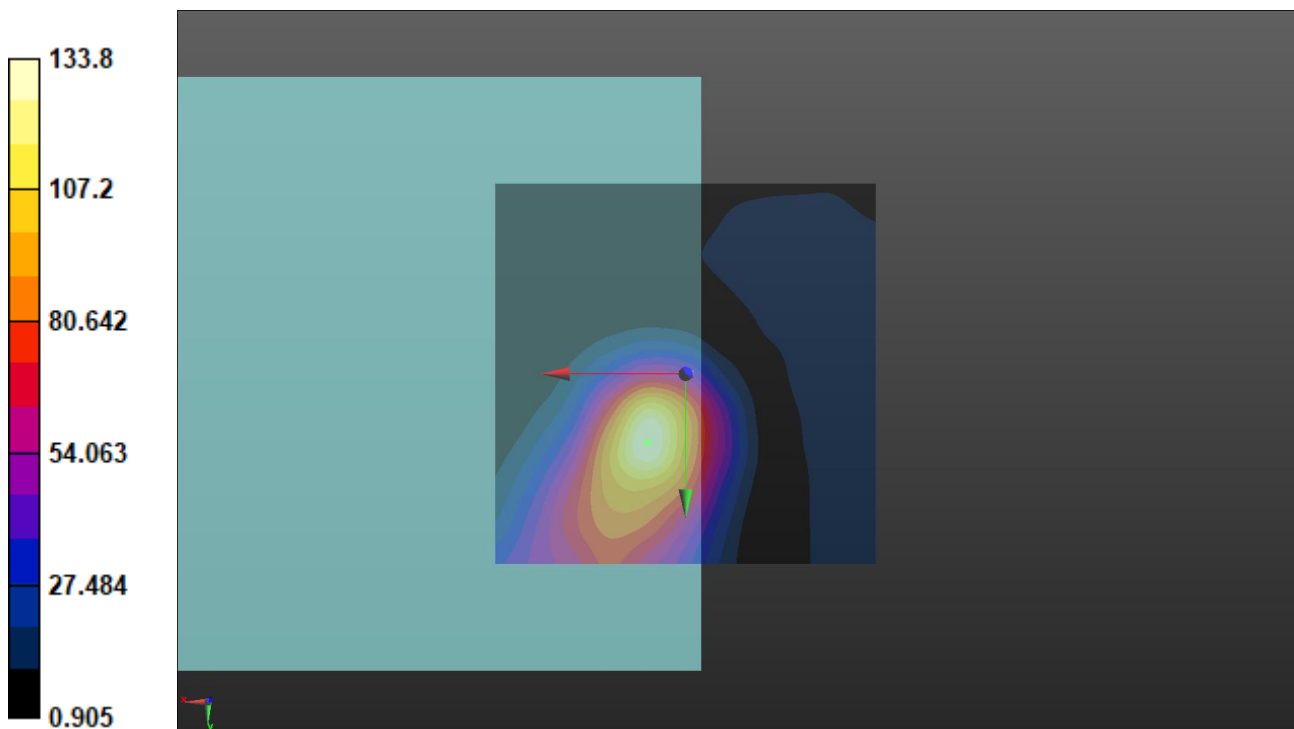
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 42.53 dB

ABM1 comp = 0.99 dBA/m

Location: 5, 9, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P05 T-Coil_LTE 13_QPSK10M_Ch23230_1RB_OS0_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 782 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

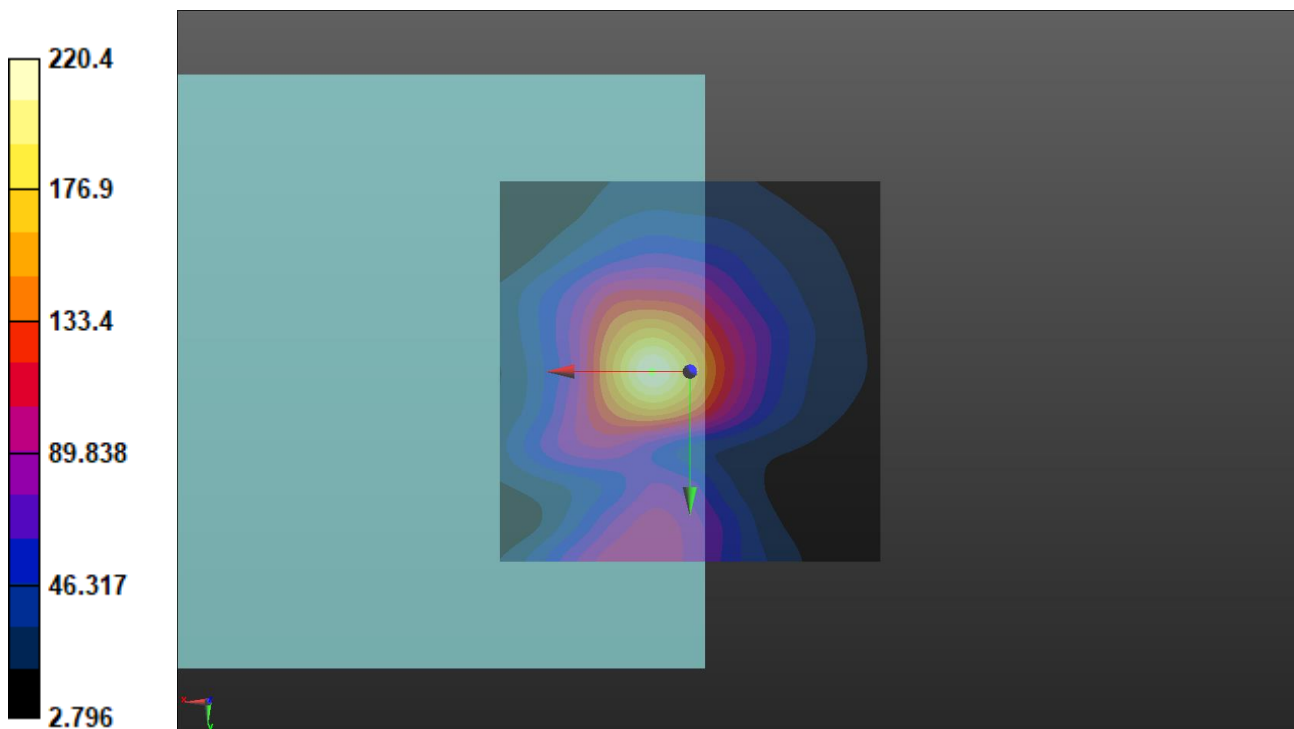
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 46.86 dB

ABM1 comp = -5.42 dBA/m

Location: 5, 0, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P05 T-Coil_LTE 13_QPSK10M_Ch23230_1RB_OS0_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10175 - CAH, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 782 MHz; Duty Cycle: 1:3.74

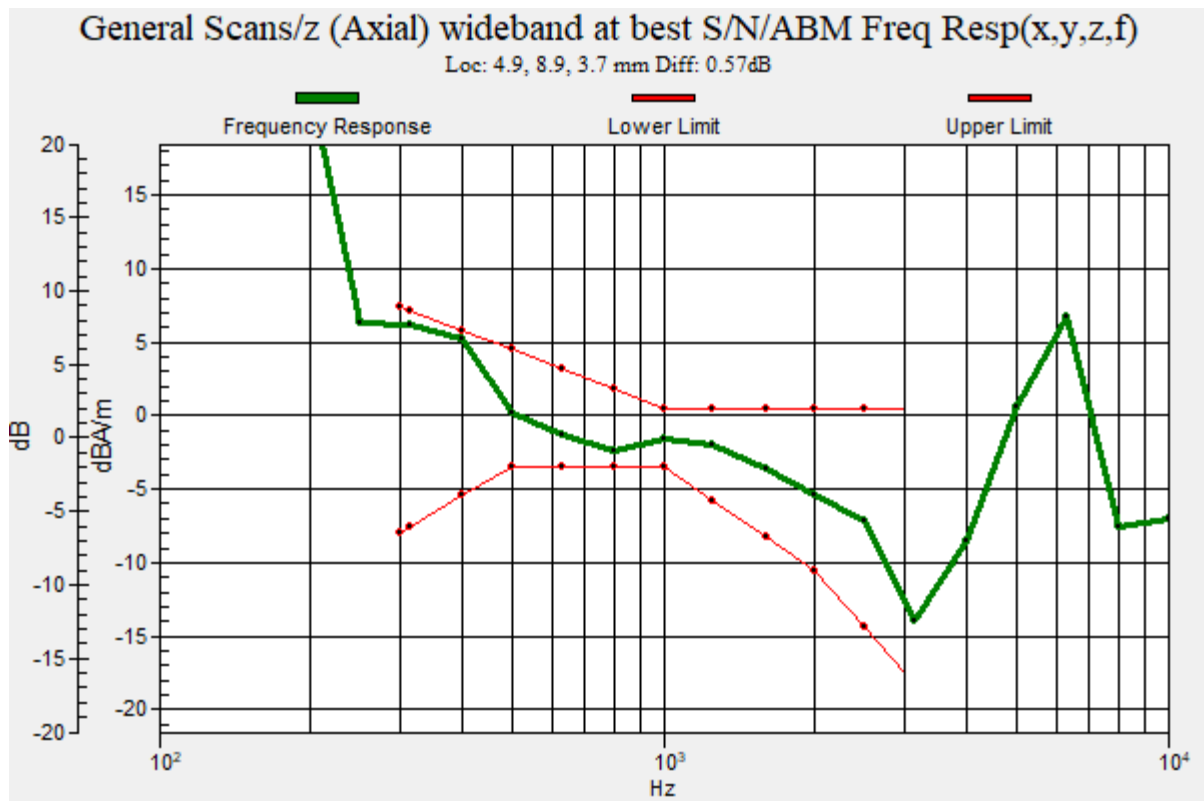
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.6 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P06 T-Coil_LTE 66_QPSK20M_Ch132322_1RB_OS0_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1745 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

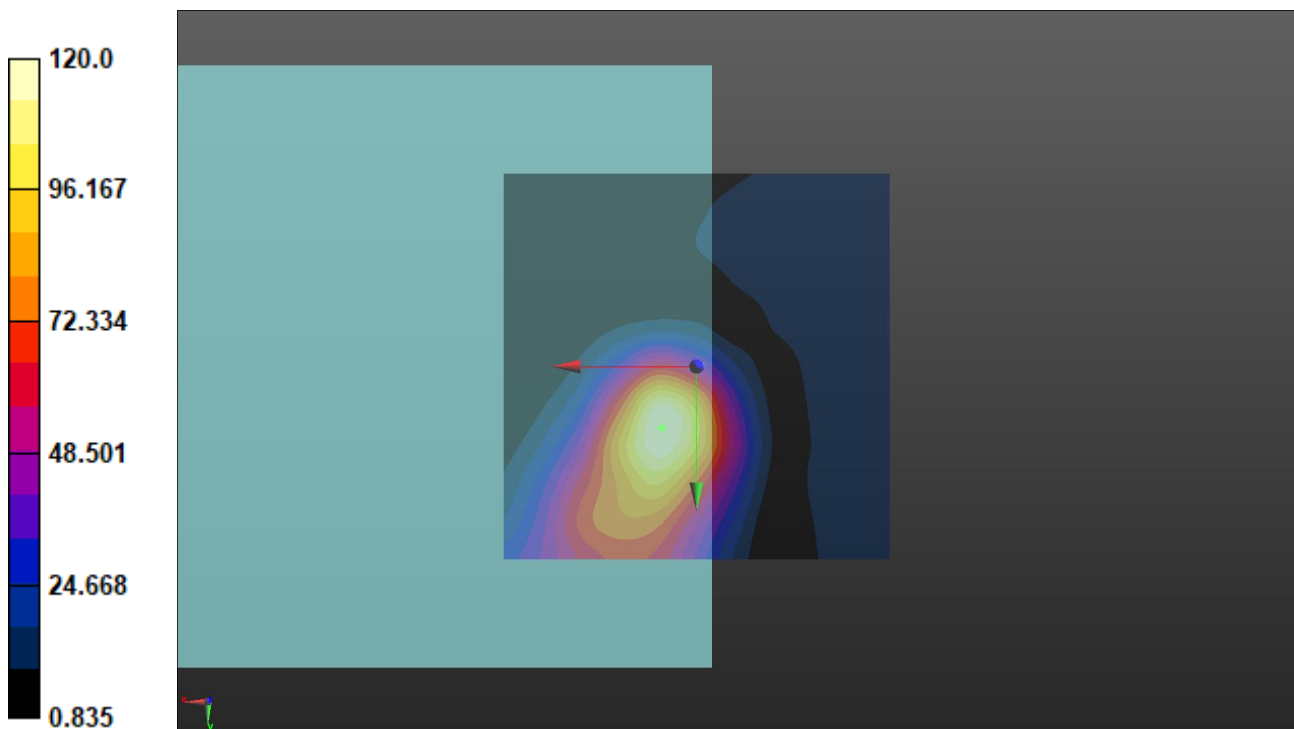
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 41.58 dB

ABM1 comp = -0.06 dBA/m

Location: 4.5, 8, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P06 T-Coil_LTE 66_QPSK20M_Ch132322_1RB_OS0_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1745 MHz; Duty Cycle: 1:3.74

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

Ambient Temperature : 22.6 °C

DASY5 Configuration:

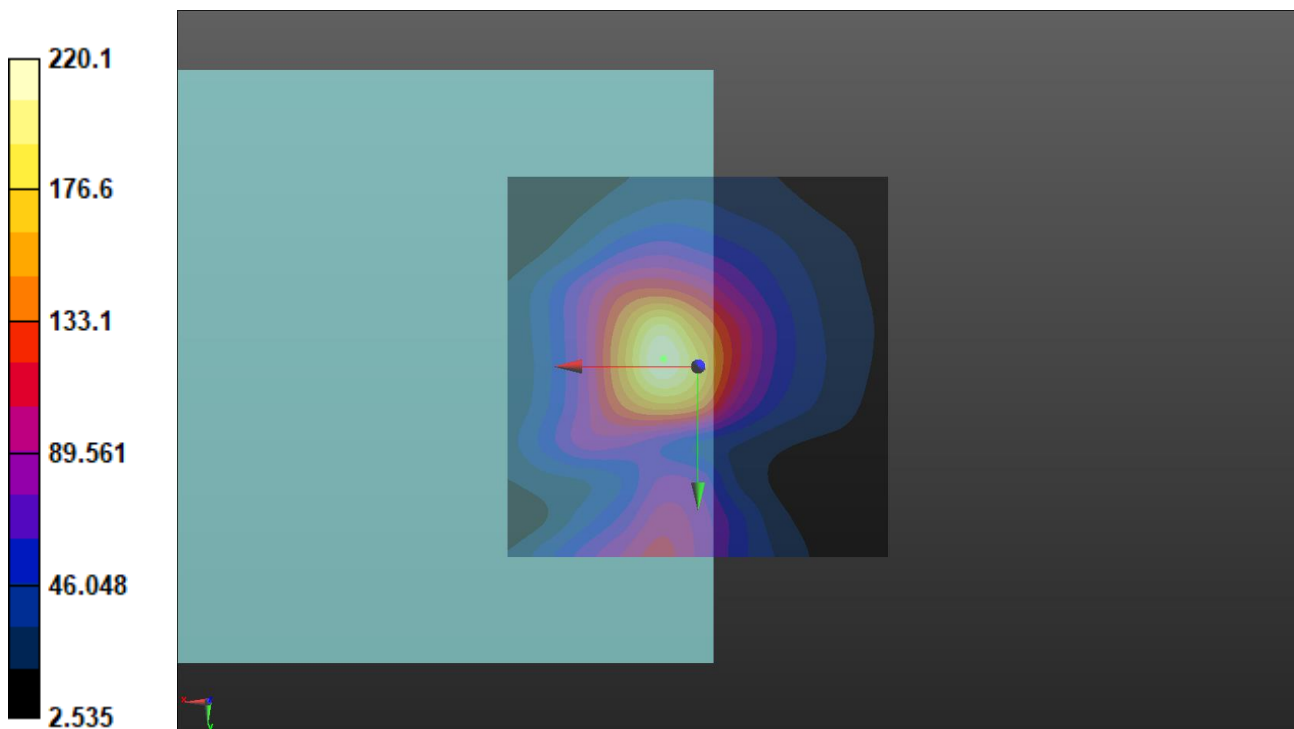
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 46.85 dB

ABM1 comp = -5.69 dBA/m

Location: 4.5, -1, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/17

P06 T-Coil_LTE 66_QPSK20M_Ch132322_1RB_OS0_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10169 - CAF, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1745 MHz; Duty Cycle: 1:3.74

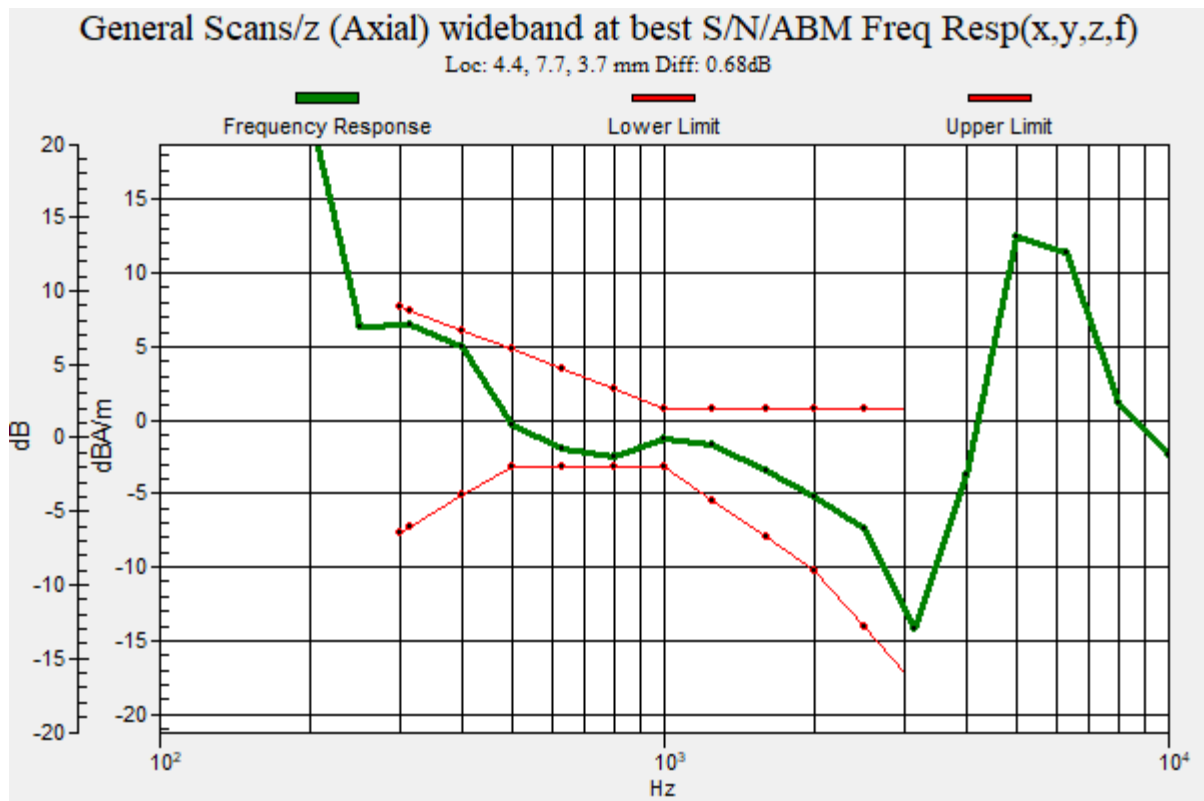
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.6 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/20

P07 T-Coil_WLAN2.4G_802.11b_1Mbps_Ch6_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz; Duty Cycle: 1:1

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

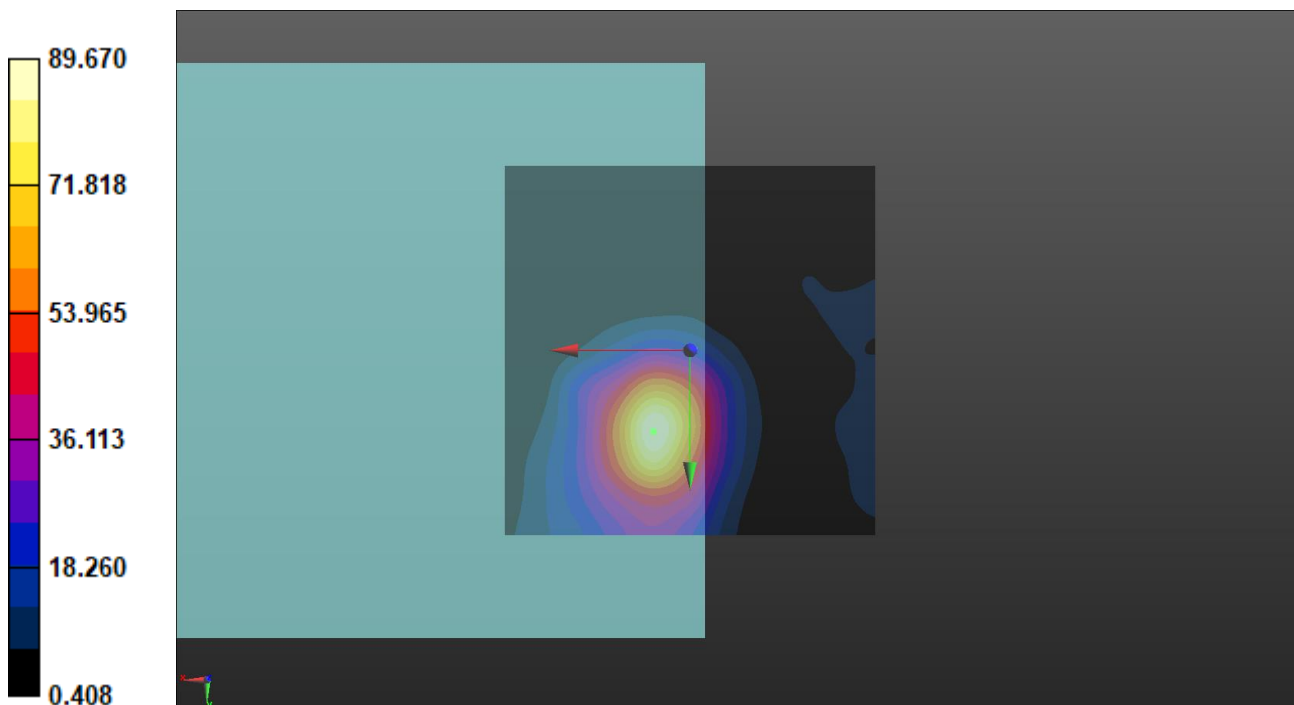
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 39.05 dB

ABM1 comp = -2.14 dBA/m

Location: 5, 11, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/20

P07 T-Coil_WLAN2.4G_802.11b_1Mbps_Ch6_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz; Duty Cycle: 1:1

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

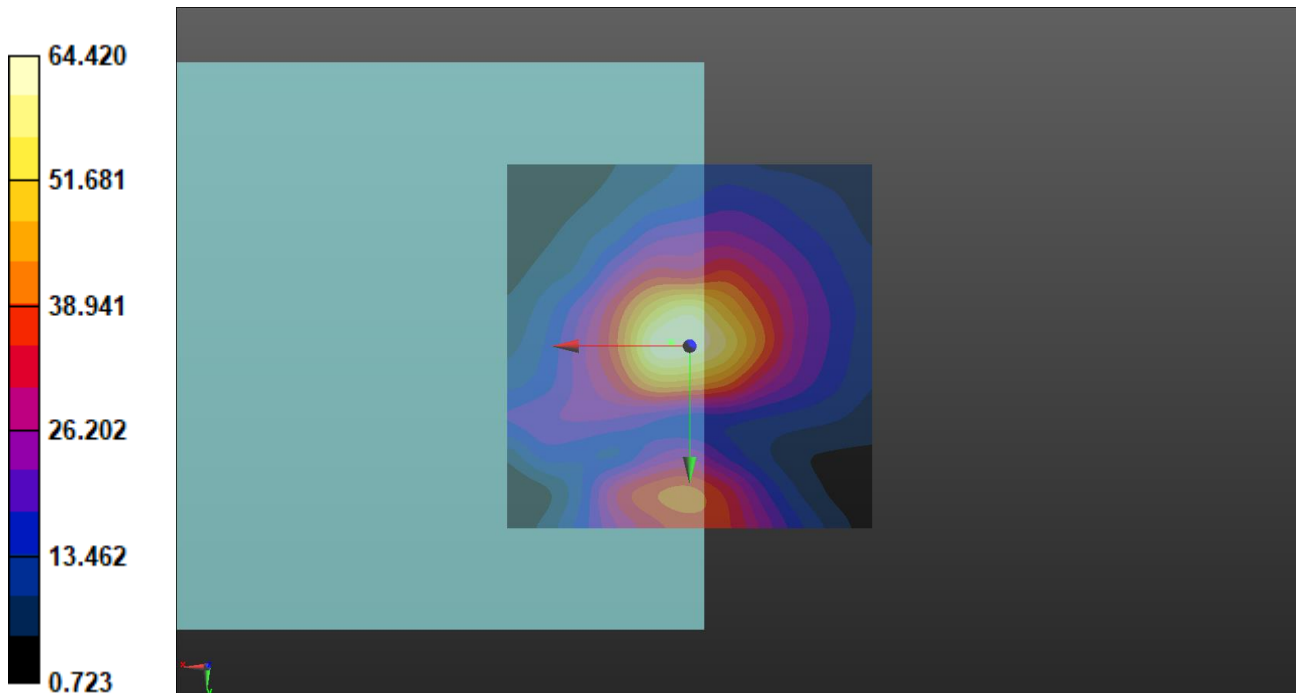
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 36.18 dB

ABM1 comp = -9.71 dBA/m

Location: 2.5, -0.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/20

P07 T-Coil_WLAN2.4G_802.11b_1Mbps_Ch6_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz; Duty Cycle: 1:1

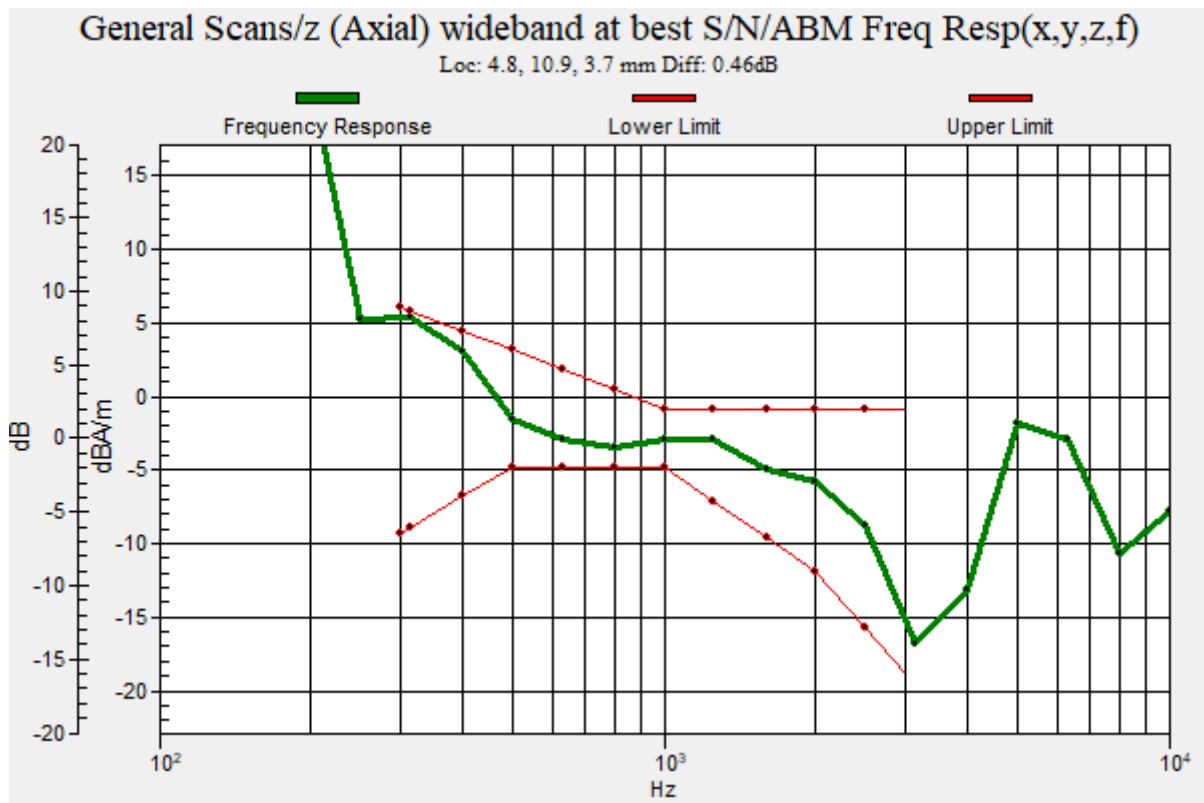
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.9 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P15 T-Coil_WLAN5.2G_802.11a_6Mbps_Ch40_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5200 MHz; Duty Cycle: 1:1

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

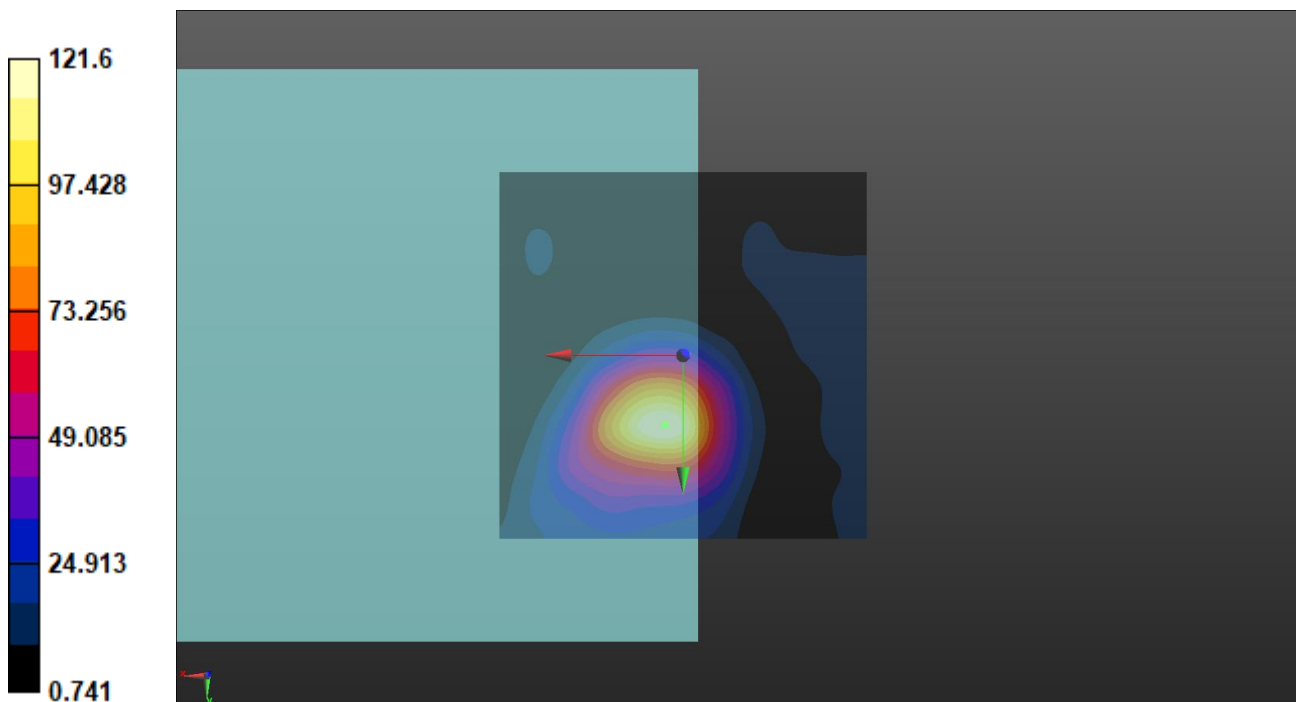
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 41.70 dB

ABM1 comp = -3.04 dBA/m

Location: 2.5, 9.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P15 T-Coil_WLAN5.2G_802.11a_6Mbps_Ch40_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5200 MHz; Duty Cycle: 1:1

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

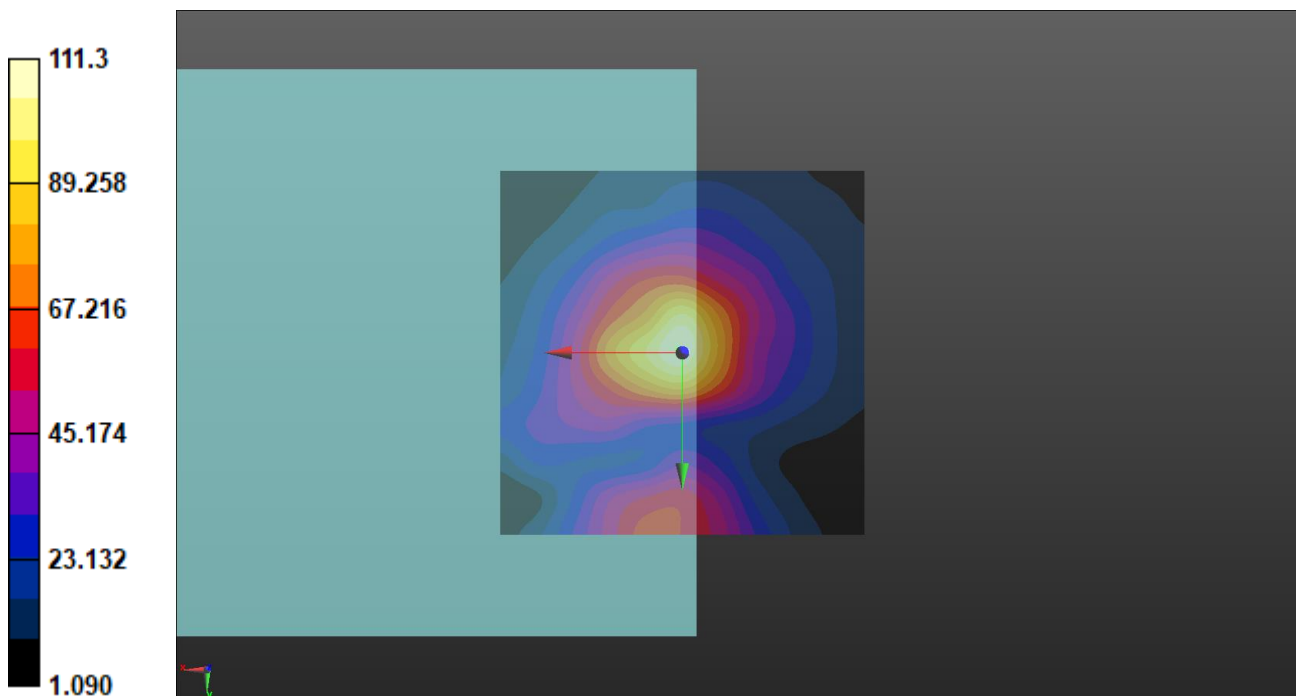
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 40.93 dB

ABM1 comp = -10.52 dBA/m

Location: 0.5, -0.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P15 T-Coil_WLAN5.2G_802.11a_6Mbps_Ch40_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5200 MHz; Duty Cycle: 1:1

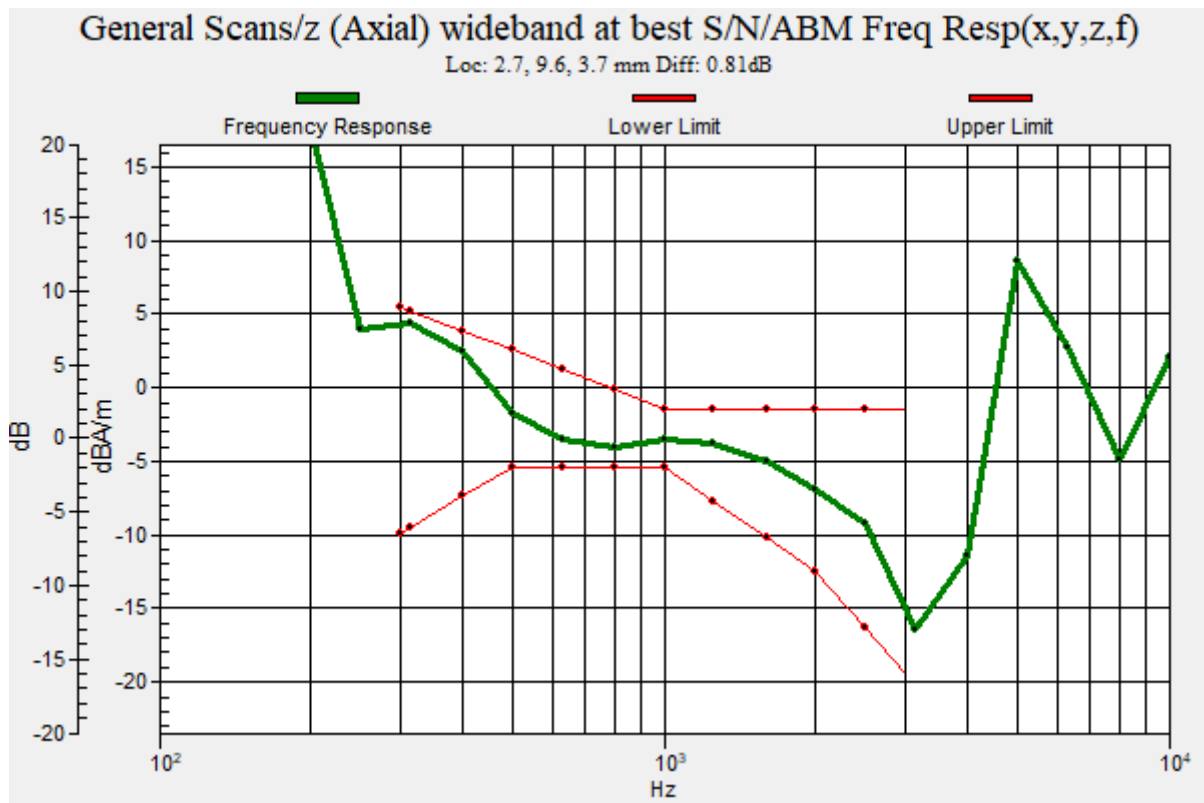
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.9 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P31 T-Coil_WLAN5.3G_802.11a_6Mbps_Ch56_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5280

MHz;Duty Cycle: 1:7.38

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

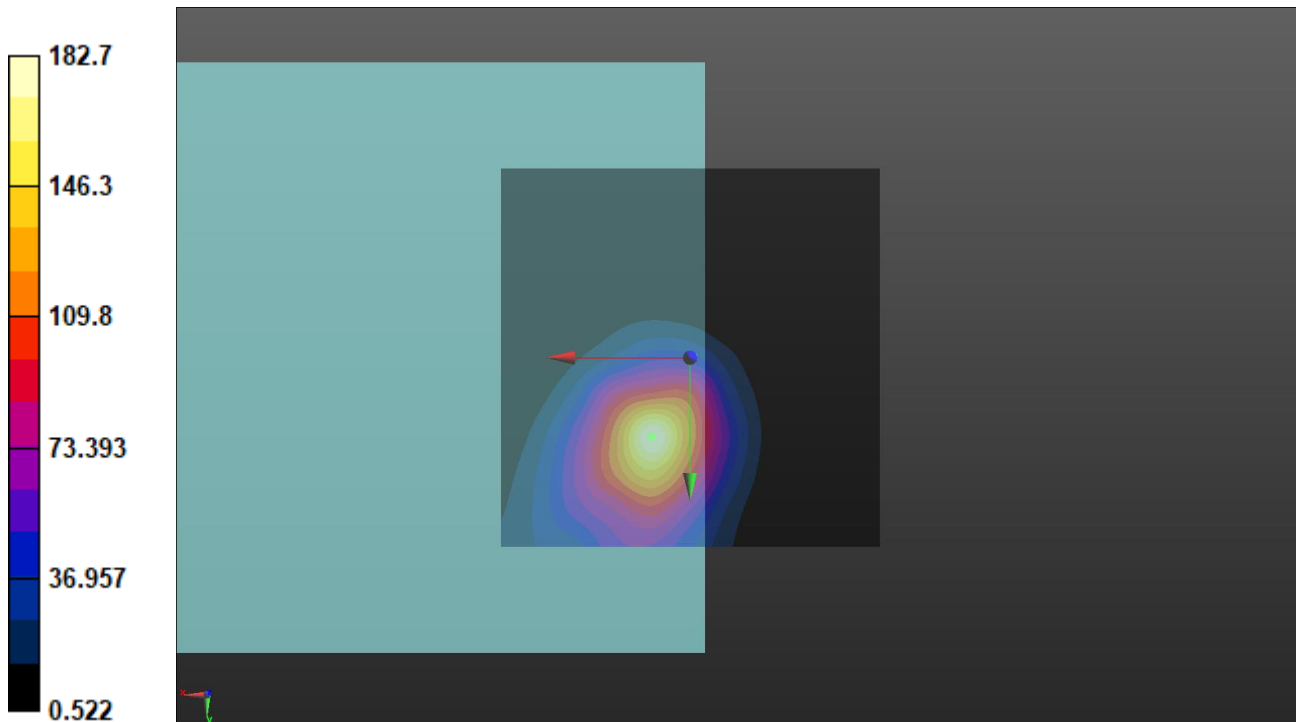
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 45.24 dB

ABM1 comp = -1.95 dBA/m

Location: 5, 10.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P31 T-Coil_WLAN5.3G_802.11a_6Mbps_Ch56_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5280 MHz; Duty Cycle: 1:7.38

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

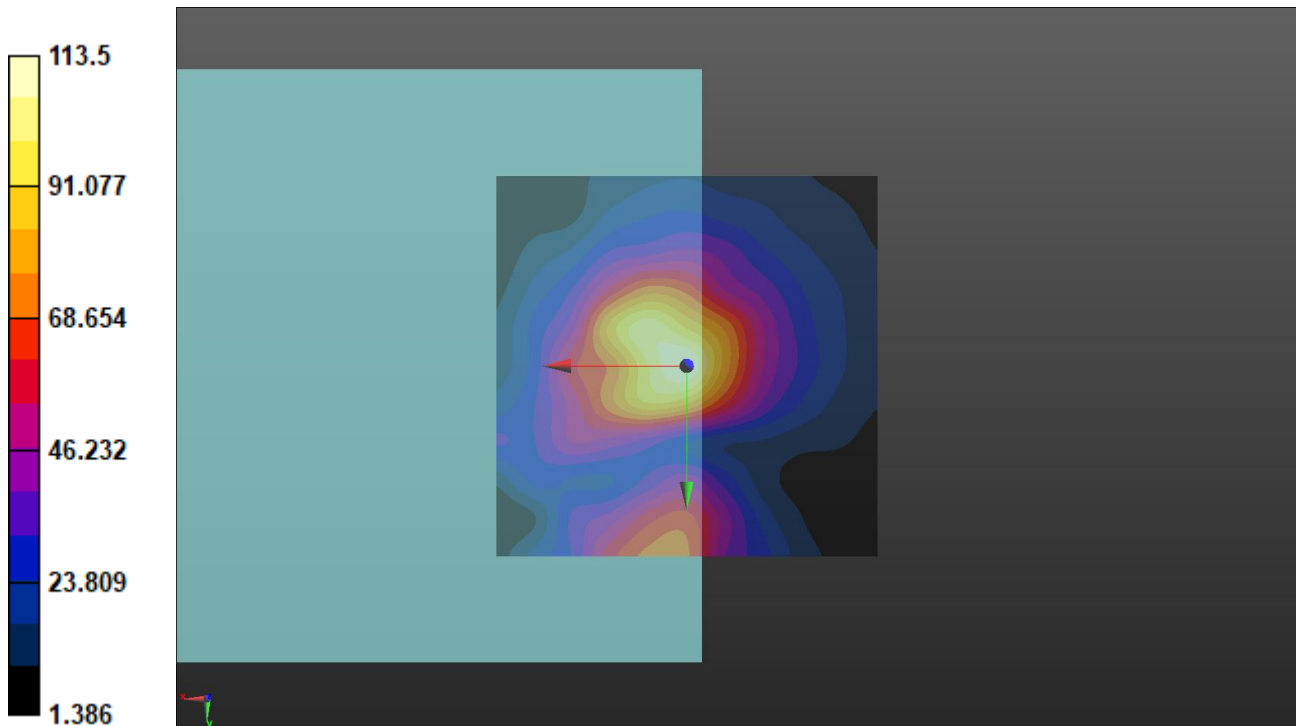
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 41.10 dB

ABM1 comp = -10.95 dBA/m

Location: 0.5, 0, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P31 T-Coil_WLAN5.3G_802.11a_6Mbps_Ch56_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5280 MHz; Duty Cycle: 1:7.38

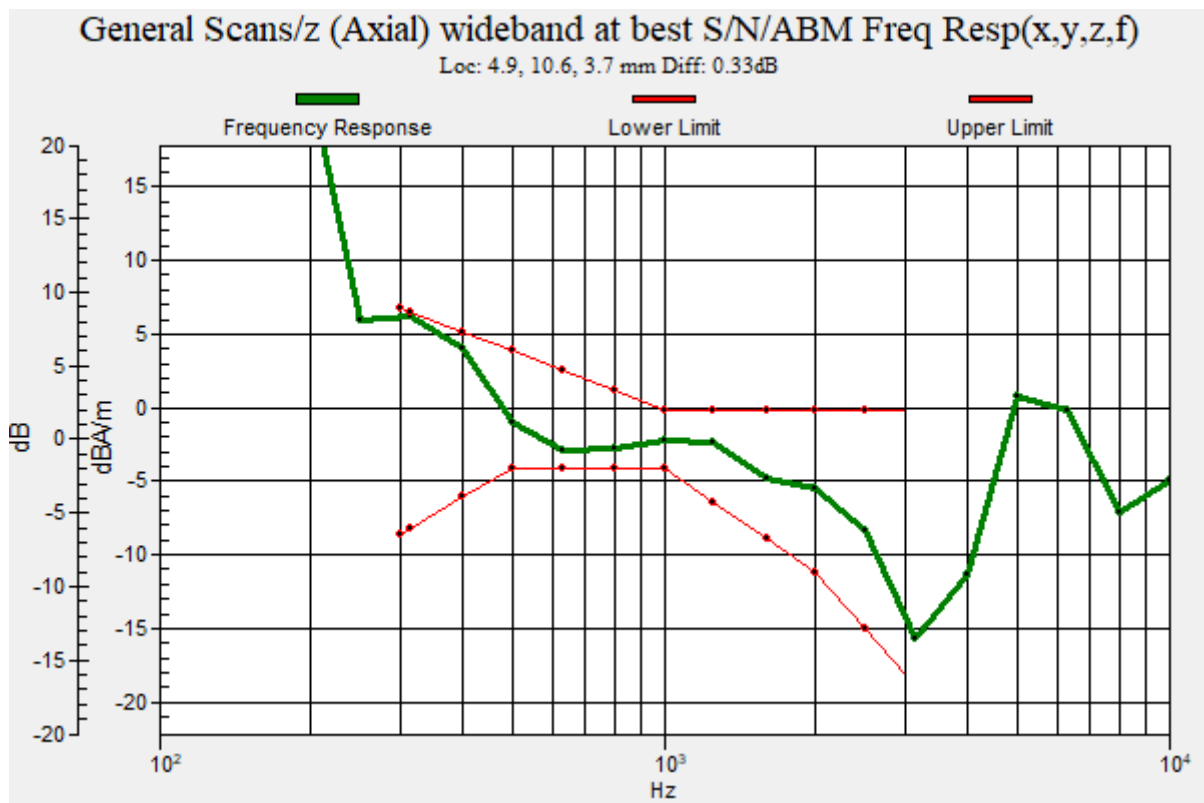
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.9 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P32 T-Coil_WLAN5.6G_802.11a_6Mbps_Ch116_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5580

MHz; Duty Cycle: 1:7.38

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

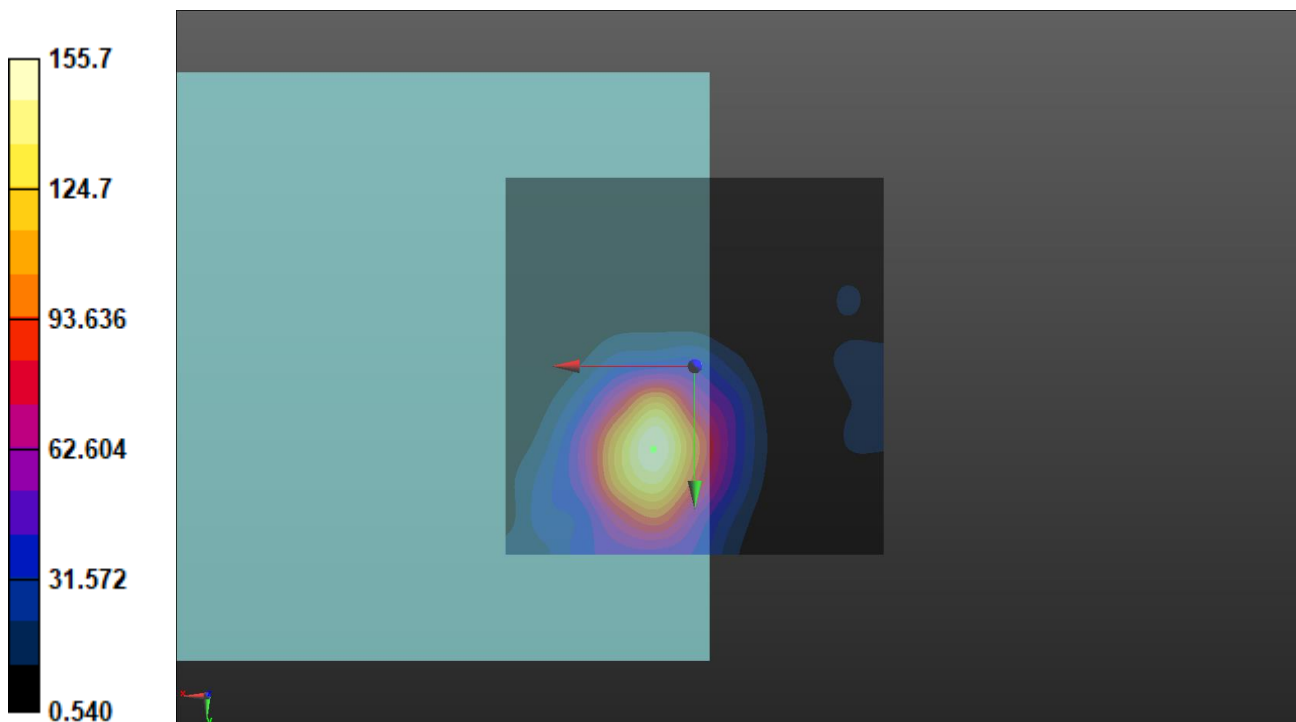
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 43.84 dB

ABM1 comp = -2.30 dBA/m

Location: 5.5, 11, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P32 T-Coil_WLAN5.6G_802.11a_6Mbps_Ch116_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5580 MHz; Duty Cycle: 1:7.38

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

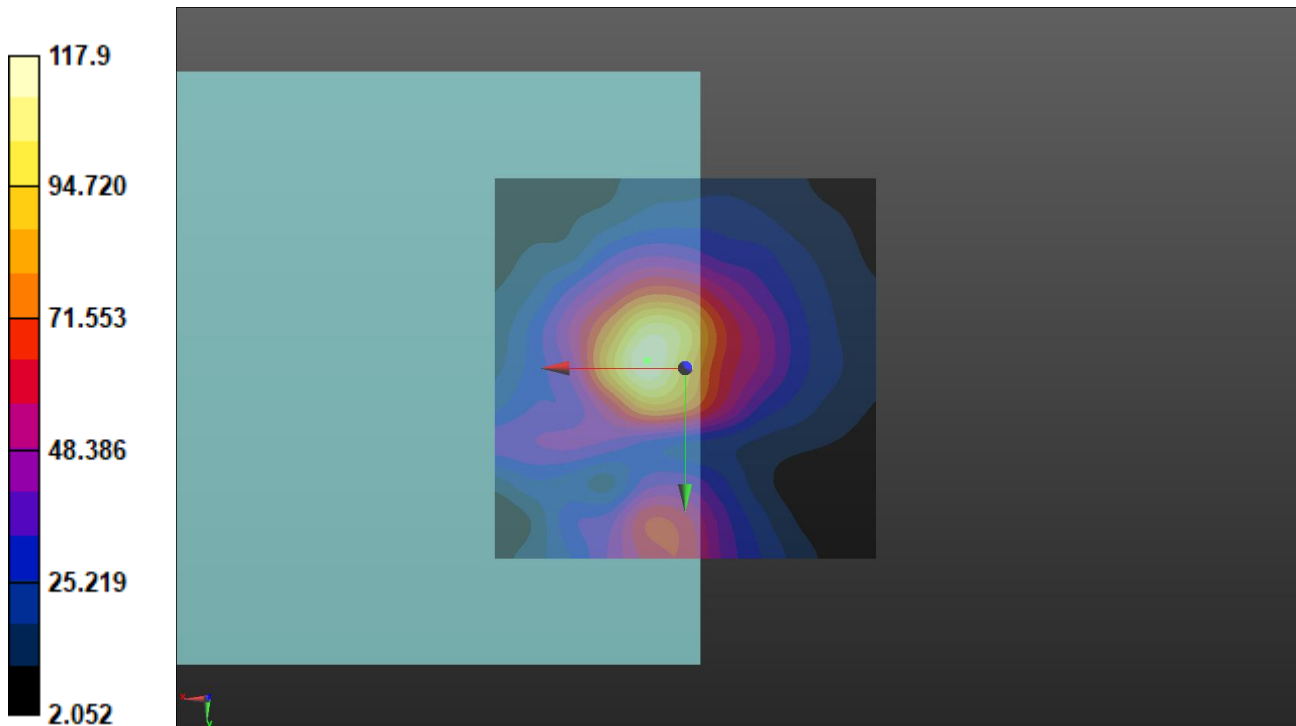
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 41.43 dB

ABM1 comp = -9.35 dBA/m

Location: 5, -1, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P32 T-Coil_WLAN5.6G_802.11a_6Mbps_Ch116_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5580 MHz; Duty Cycle: 1:7.38

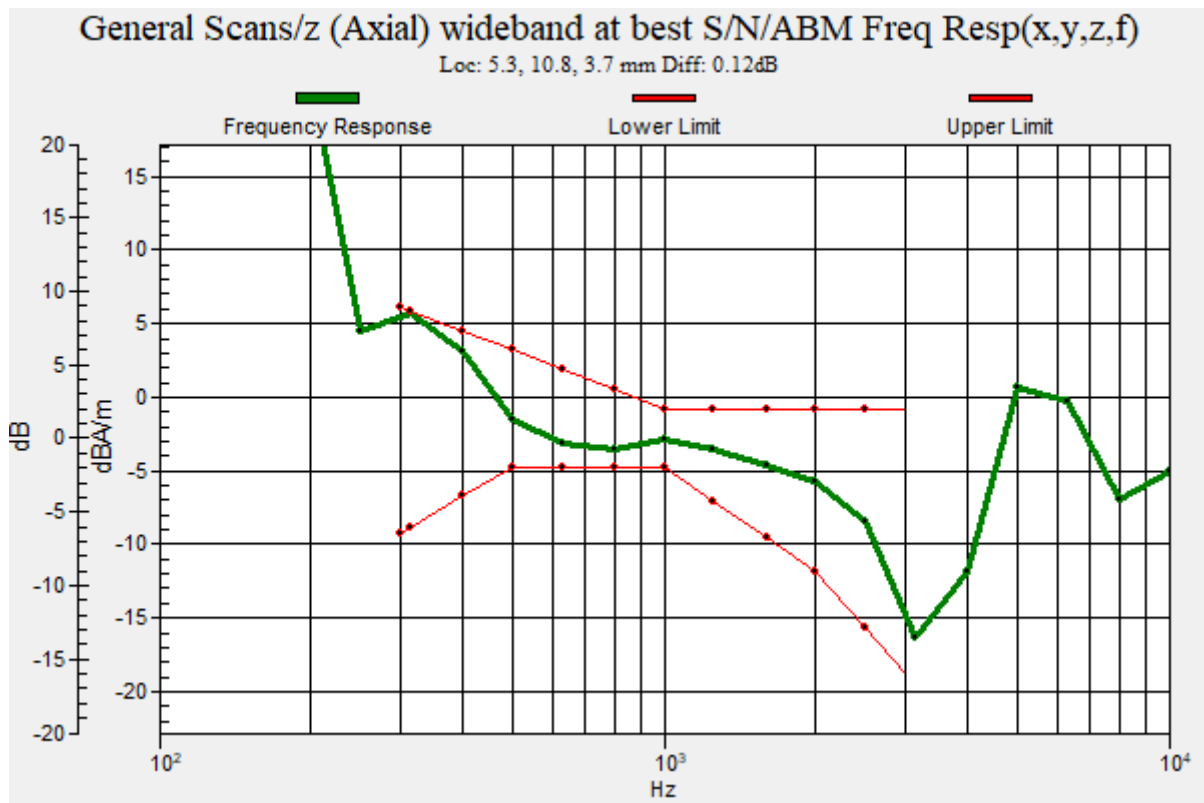
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.9 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P33 T-Coil_WLAN5.8G_802.11a_6Mbps_Ch157_AMR WB 6.6kbps_Axial (Z)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5785 MHz; Duty Cycle: 1:7.38

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

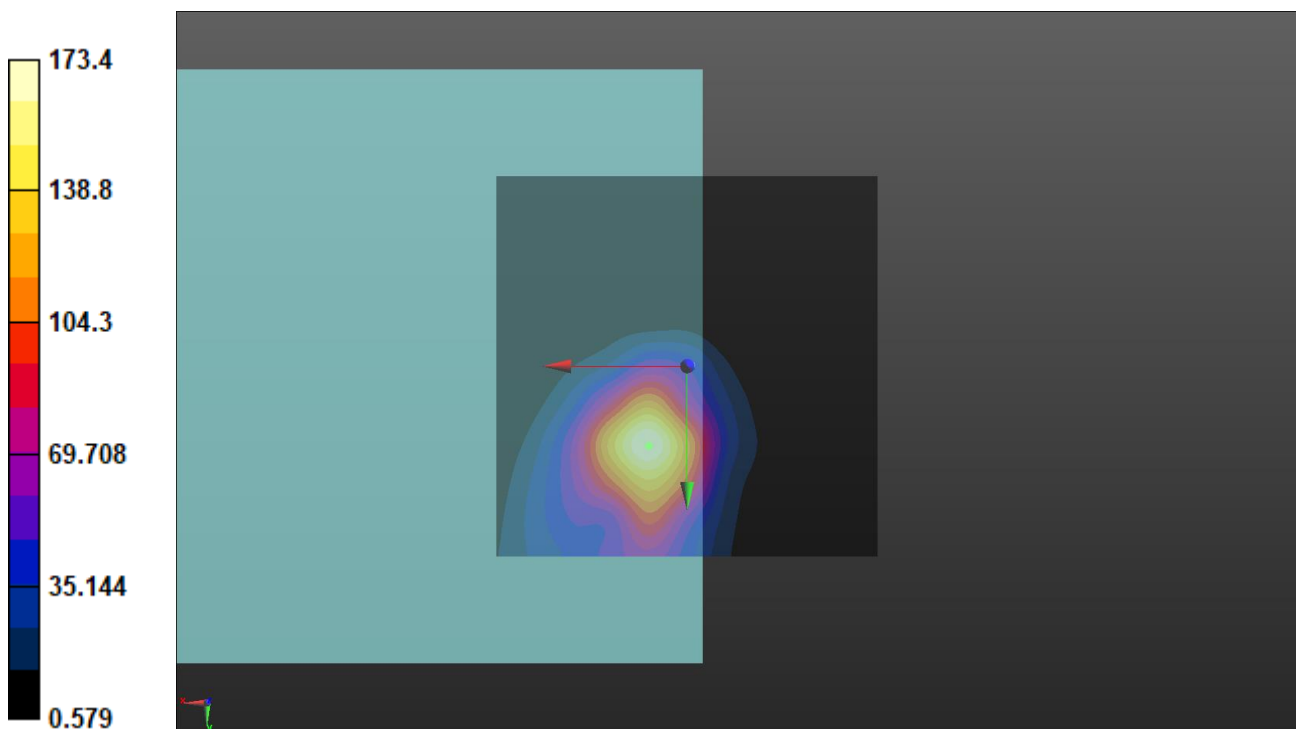
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 44.78 dB

ABM1 comp = -2.17 dBA/m

Location: 5, 10.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P33 T-Coil_WLAN5.8G_802.11a_6Mbps_Ch157_AMR WB 6.6kbps_Radial (Y)

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5785

MHz; Duty Cycle: 1:7.38

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

Ambient Temperature : 22.9 °C

DASY5 Configuration:

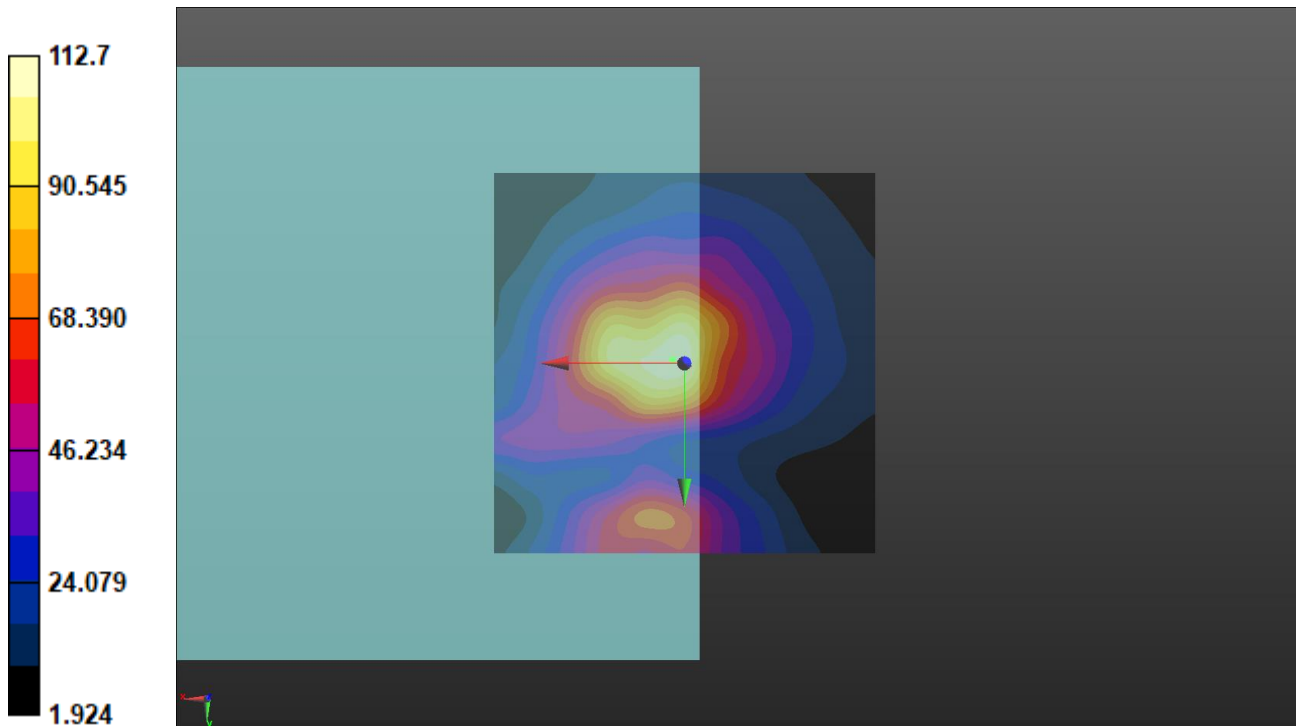
- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Interpolated grid: dx=1.000 mm, dy=1.000 mm

ABM1/ABM2 = 41.04 dB

ABM1 comp = -10.30 dBA/m

Location: 1.5, -0.5, 3.7 mm



Plots of Measurement

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab

Date: 2023/11/21

P33 T-Coil_WLAN5.8G_802.11a_6Mbps_Ch157_AMR WB 6.6kbps_Freq Resp

DUT: BFOK-WTW-P23090593

Communication System: UID 10062 - CAD, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5785 MHz; Duty Cycle: 1:7.38

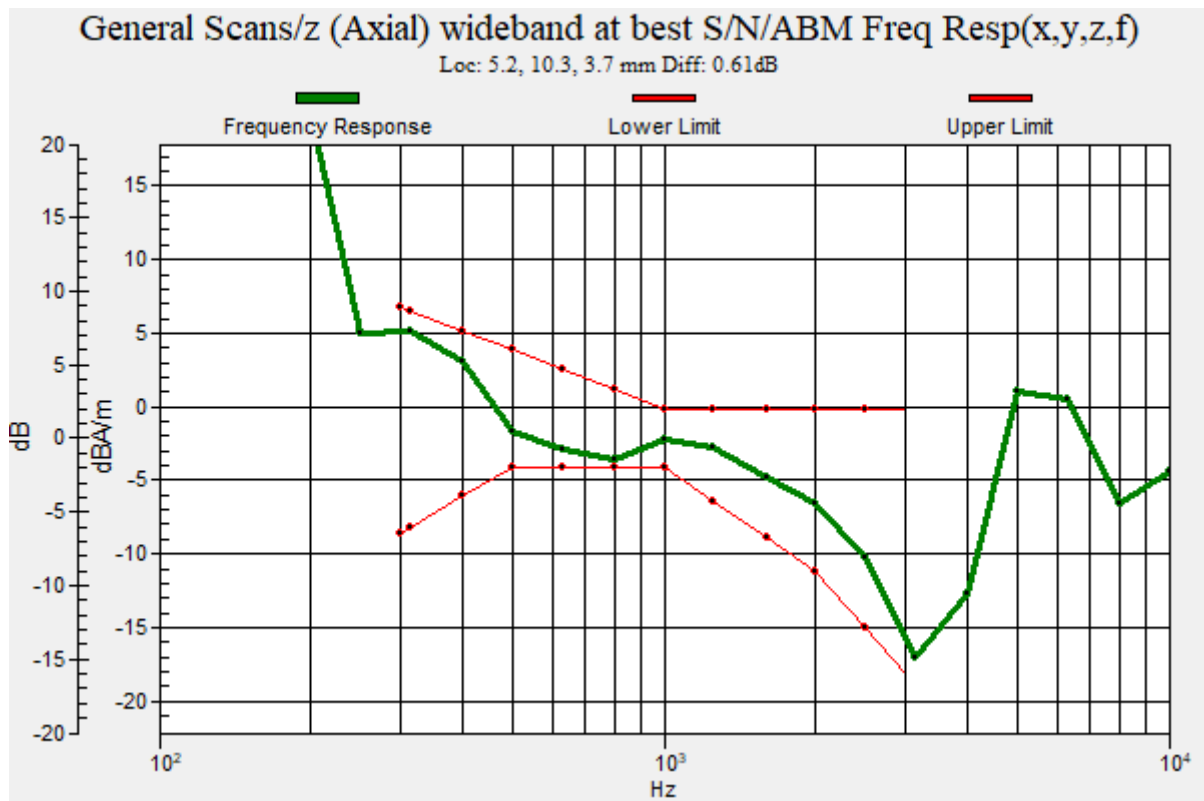
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Ambient Temperature : 22.9 °C

DASY5 Configuration:

- Probe: AM1DV3 - 3060; ; Calibrated: 2023/01/18
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn1585; Calibrated: 2023/07/14
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

T-Coil scan (scan for ANSI C63.19 compliance)/General Scans: Measurement grid: dx=10mm, dy=10mm





Appendix B. HAC T-Coil Test Result

HAC Testing Results are shown as below.

Test Result for VoLTE
Radio Configuration Investigation

	Air Interface	Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Channel	Codec Setting	UL-DL Configuration	Probe Orientation	ABM1 (dB A/m)	ABM2 (dB A/m)	SNR (dB)
	FDD-LTE	LTE B2	20	QPSK	1	0	18900	AMR WB 6.6kbps		Axial (Z)	0.37	-41.92	42.29
	FDD-LTE	LTE B2	20	QPSK	1	50	18900	AMR WB 6.6kbps		Axial (Z)	0.41	-41.93	42.34
	FDD-LTE	LTE B2	20	QPSK	1	99	18900	AMR WB 6.6kbps		Axial (Z)	1.21	-41.51	42.72
	FDD-LTE	LTE B2	20	QPSK	50	0	18900	AMR WB 6.6kbps		Axial (Z)	0.19	-42.23	42.42
	FDD-LTE	LTE B2	20	QPSK	50	25	18900	AMR WB 6.6kbps		Axial (Z)	0.79	-41.56	42.35
	FDD-LTE	LTE B2	20	QPSK	50	50	18900	AMR WB 6.6kbps		Axial (Z)	0.6	-41.72	42.32
	FDD-LTE	LTE B2	20	QPSK	100	0	18900	AMR WB 6.6kbps		Axial (Z)	1.37	-41.59	42.96
	FDD-LTE	LTE B2	20	16QAM	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1.69	-41.19	42.88
	FDD-LTE	LTE B2	20	64QAM	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1.59	-41	42.59
	FDD-LTE	LTE B2	15	QPSK	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1	-41.36	42.36
	FDD-LTE	LTE B2	10	QPSK	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1.3	-41.16	42.46
	FDD-LTE	LTE B2	5	QPSK	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1.39	-41.17	42.56
	FDD-LTE	LTE B2	3	QPSK	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1.26	-41.42	42.68
	FDD-LTE	LTE B2	1.4	QPSK	1	0	18900	AMR WB 6.6kbps		Axial (Z)	1.17	-41.44	42.61

Codec Investigation

	Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Channel	Codec Setting	Probe Orientation	ABM1 (dB A/m)	ABM2 (dB A/m)	Frequency Response Margin (dB)	Frequency Response	SNR (dB)
	LTE B2	20	QPSK	1	0	18900	AMR NB 4.75kbps	Axial (Z)	0.43	-41.94	1.73	Pass	42.37
	LTE B2	20	QPSK	1	0	18900	AMR NB 12.2kbps	Axial (Z)	-0.4	-42.73	1.55	Pass	42.33
	LTE B2	20	QPSK	1	0	18900	AMR WB 6.6kbps	Axial (Z)	0.71	-41.58	1.02	Pass	42.29
	LTE B2	20	QPSK	1	0	18900	AMR WB 14.25kbps	Axial (Z)	0.63	-41.77	0.47	Pass	42.4

Official Testing

Plot No.	Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Channel	UL-DL Configuration	Codec Setting	Probe Orientation	ABM1 (dB A/m)	ABM2 (dB A/m)	Ambient Noise (dB A/m)	Frequency Response Margin (dB)	Frequency Response	SNR (dB)	FCC Limit (dB)	FCC Margin (dB)	T-Rating
1	LTE B2	20	QPSK	1	0	18900		AMR WB 6.6kbps	Axial (Z)	0.71	-41.58	-55.35	1.02	Pass	42.29	20	-22.29	T4
	LTE B2	20	QPSK	1	0	18900		AMR WB 6.6kbps	Radial (Y)	-7	-52.66	-55.09			45.66	20	-25.66	T4
2	LTE B4	20	QPSK	1	0	20175		AMR WB 6.6kbps	Axial (Z)	0.29	-41.14	-55.35	0.47	Pass	41.43	20	-21.43	T4
	LTE B4	20	QPSK	1	0	20175		AMR WB 6.6kbps	Radial (Y)	-6.61	-52.31	-55.09			45.7	20	-25.7	T4
3	LTE B5	10	QPSK	1	0	20525		AMR WB 6.6kbps	Axial (Z)	0.5	-41.92	-55.35	0.86	Pass	42.42	20	-22.42	T4
	LTE B5	10	QPSK	1	0	20525		AMR WB 6.6kbps	Radial (Y)	-5.63	-52.07	-55.09			46.44	20	-26.44	T4
4	LTE B12	10	QPSK	1	0	23095		AMR WB 6.6kbps	Axial (Z)	0.5	-41.95	-55.35	0.83	Pass	42.45	20	-22.45	T4
	LTE B12	10	QPSK	1	0	23095		AMR WB 6.6kbps	Radial (Y)	-6.02	-52.45	-55.09			46.43	20	-26.43	T4
5	LTE B13	10	QPSK	1	0	23230		AMR WB 6.6kbps	Axial (Z)	0.99	-41.54	-55.35	0.57	Pass	42.53	20	-22.53	T4
	LTE B13	10	QPSK	1	0	23230		AMR WB 6.6kbps	Radial (Y)	-5.42	-52.28	-55.09			46.86	20	-26.86	T4
6	LTE B66	20	QPSK	1	0	132322		AMR WB 6.6kbps	Axial (Z)	-0.06	-41.64	-55.35	0.68	Pass	41.58	20	-21.58	T4
	LTE B66	20	QPSK	1	0	132322		AMR WB 6.6kbps	Radial (Y)	-5.69	-52.54	-55.09			46.85	20	-26.85	T4

Test Result for VoWiFi
Radio Configuration Investigation

	Band	Mode	Data Rate	Channel	Probe Orientation	ABM1 (dB A/m)	ABM2 (dB A/m)	SNR (dB)
	WLAN 2.4G	802.11b	1Mbps	6	Axial (Z)	-2.14	-41.19	39.05
	WLAN 2.4G	802.11b	11Mbps	6	Axial (Z)	-2.22	-44.66	42.44
	WLAN 2.4G	802.11g	6Mbps	6	Axial (Z)	-2.98	-43.46	40.48
	WLAN 2.4G	802.11g	54Mbps	6	Axial (Z)	-2.35	-42.98	40.63
	WLAN 2.4G	802.11n HT20	MCS0	6	Axial (Z)	-2.39	-47.27	44.88
	WLAN 2.4G	802.11n HT20	MCS7	6	Axial (Z)	-2.34	-46.16	43.82
	WLAN 2.4G	802.11n HT40	MCS0	6	Axial (Z)	-1.79	-46.31	44.52
	WLAN 2.4G	802.11n HT40	MCS7	6	Axial (Z)	-1.64	-46.8	45.16
	WLAN 5.2G	802.11a	6Mbps	40	Axial (Z)	-3.04	-44.74	41.7
	WLAN 5.2G	802.11a	54Mbps	40	Axial (Z)	-2.23	-46.87	44.64
	WLAN 5.2G	802.11n HT20	MCS0	40	Axial (Z)	-2.55	-44.28	41.73
	WLAN 5.2G	802.11n HT20	MCS7	40	Axial (Z)	-3.14	-46.69	43.55
	WLAN 5.2G	802.11n HT40	MCS0	38	Axial (Z)	-1.58	-46.6	45.02
	WLAN 5.2G	802.11n HT40	MCS7	38	Axial (Z)	-2.54	-46.65	44.11
	WLAN 5.2G	802.11ac VHT20	MCS0	40	Axial (Z)	-2.73	-45.3	42.57
	WLAN 5.2G	802.11ac VHT20	MCS8	40	Axial (Z)	-2.87	-46.4	43.53
	WLAN 5.2G	802.11ac VHT40	MCS0	38	Axial (Z)	-2.74	-46.5	43.76
	WLAN 5.2G	802.11ac VHT40	MCS8	38	Axial (Z)	-1.73	-46.41	44.68

Codec Investigation

	Band	Mode	Data Rate	Channel	Codec Setting	Probe Orientation	ABM1 (dB A/m)	ABM2 (dB A/m)	Frequency Response Margin (dB)	Frequency Response	SNR (dB)
	WLAN 2.4G	802.11b	1Mbps	6	AMR NB 4.75kbps	Axial (Z)	1.31	-40.74	1.43	Pass	42.05
	WLAN 2.4G	802.11b	1Mbps	6	AMR NB 12.2kbps	Axial (Z)	0.25	-44.62	1.27	Pass	44.87
	WLAN 2.4G	802.11b	1Mbps	6	AMR WB 6.6kbps	Axial (Z)	-2.14	-41.19	0.46	Pass	39.05
	WLAN 2.4G	802.11b	1Mbps	6	AMR WB 23.85kbps	Axial (Z)	-1.52	-44.06	0.58	Pass	42.54

Official Testing

Plot No.	Band	Mode	Data Rate	Channel	Codec Setting	Probe Orientation	ABM1 (dB A/m)	ABM2 (dB A/m)	Ambient Noise (dB A/m)	Frequency Response Margin (dB)	Frequency Response	SNR (dB)	FCC Limit (dB)	FCC Margin (dB)	T-Rating
7	WLAN 2.4G	802.11b	1Mbps	6	AMR WB 6.6kbps	Axial (Z)	-2.14	-41.19	-55.61	0.46	Pass	39.05	20	-19.05	T4
7	WLAN 2.4G	802.11b	1Mbps	6	AMR WB 6.6kbps	Radial (Y)	-9.71	-45.89	-55.76			36.18	20	-16.18	T4
15	WLAN 5.2G	802.11a	6Mbps	40	AMR WB 6.6kbps	Axial (Z)	-3.04	-44.74	-55.61	0.81	Pass	41.7	20	-21.7	T4
15	WLAN 5.2G	802.11a	6Mbps	40	AMR WB 6.6kbps	Radial (Y)	-10.52	-51.45	-55.76			40.93	20	-20.93	T4
31	WLAN 5.3G	802.11a	6Mbps	56	AMR WB 6.6kbps	Axial (Z)	-1.95	-47.19	-55.34	0.33	Pass	45.24	20	-25.24	T4
31	WLAN 5.3G	802.11a	6Mbps	56	AMR WB 6.6kbps	Radial (Y)	-10.95	-52.05	-55.58			41.1	20	-21.1	T4
32	WLAN 5.6G	802.11a	6Mbps	116	AMR WB 6.6kbps	Axial (Z)	-2.3	-46.14	-55.34	0.12	Pass	43.84	20	-23.84	T4
32	WLAN 5.6G	802.11a	6Mbps	116	AMR WB 6.6kbps	Radial (Y)	-9.35	-50.78	-55.58			41.43	20	-21.43	T4
33	WLAN 5.8G	802.11a	6Mbps	157	AMR WB 6.6kbps	Axial (Z)	-2.17	-46.95	-55.34	0.61	Pass	44.78	20	-24.78	T4
33	WLAN 5.8G	802.11a	6Mbps	157	AMR WB 6.6kbps	Radial (Y)	-10.3	-51.34	-55.58			41.04	20	-21.04	T4

Appendix Z. Calibration Certificate for Probe

The SPEAG calibration certificates are shown as follows.



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 **B.V. ADT (Auden)**

Certificate No: **AM1DV3-3060_Jan23**

CALIBRATION CERTIFICATE

Object **AM1DV3 - SN: 3060**

Calibration procedure(s) **QA CAL-24.v4
Calibration procedure for AM1D magnetic field probes and TMFS in the
audio range**

Calibration date: **January 18, 2023**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	29-Aug-22 (No. 34389)	Aug-23
Reference Probe AM1DV2	SN: 1008	20-Dec-22 (No. AM1DV2-1008_Dec22)	Dec-23
DAE4	SN: 781	03-Jan-23 (No. DAE4-781_Jan23)	Jan-24

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
AMCC	SN: 1050	01-Oct-13 (in house check Oct-20)	Oct-23
AMMI Audio Measuring Instrument	SN: 1062	26-Sep-12 (in house check Oct-20)	Oct-23

	Name	Function	Signature
Calibrated by:	Aidonia Georgiadou	Laboratory Technician	
Approved by:	Sven Külm	Technical Manager	

Issued: January 18, 2023

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-C63.19-2019 (ANSI-C63.19-2011)
American National Standard, Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.
- [3] DASY System Handbook

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	3060

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)	52.2 °	+/- 3.6 ° (k=2)
Sensor angle	(in DASY system)	0.44 °	+/- 0.5 ° (k=2)
Sensitivity at 1 kHz	(in DASY system)	0.00732 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%.