

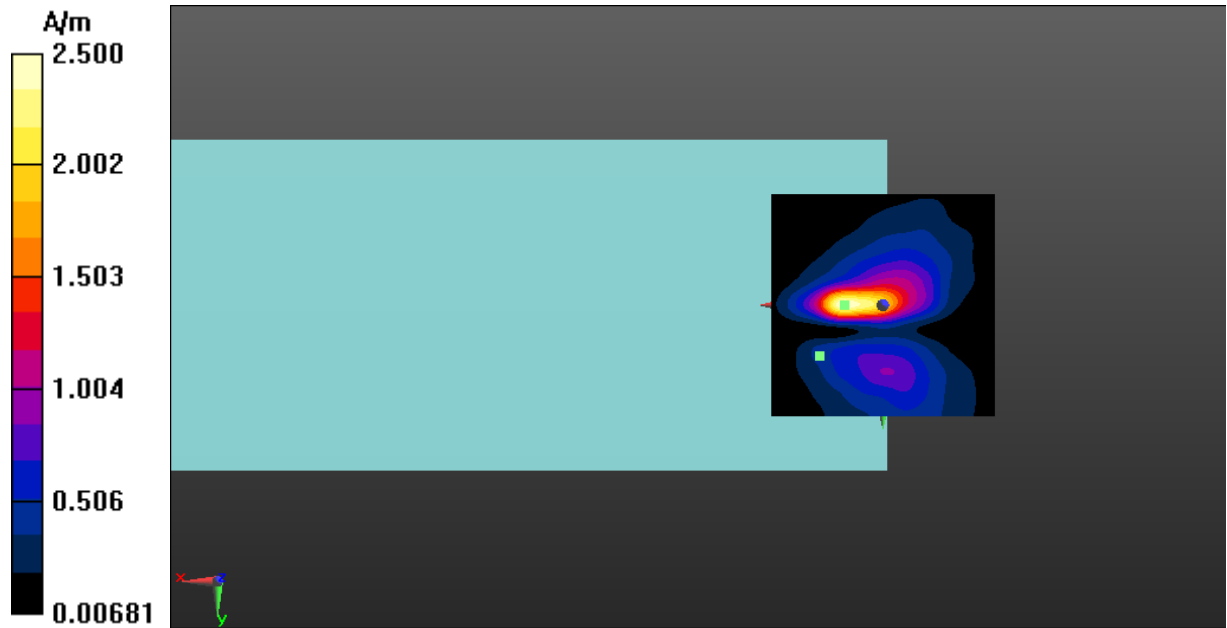


Fig A.12 T-Coil LTE-Band 71-Y



T-Coil LTE-Band 41 PC3 Axial

Date: 2022-12-14

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, LTE_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.58

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 13.76 dBA/m

BWC Factor = 0.16 dB

Location: 15, 8, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 53.69 dB

ABM1 comp = 7.99 dBA/m

BWC Factor = 0.16 dB

Location: 5, 9.5, 3.7 mm

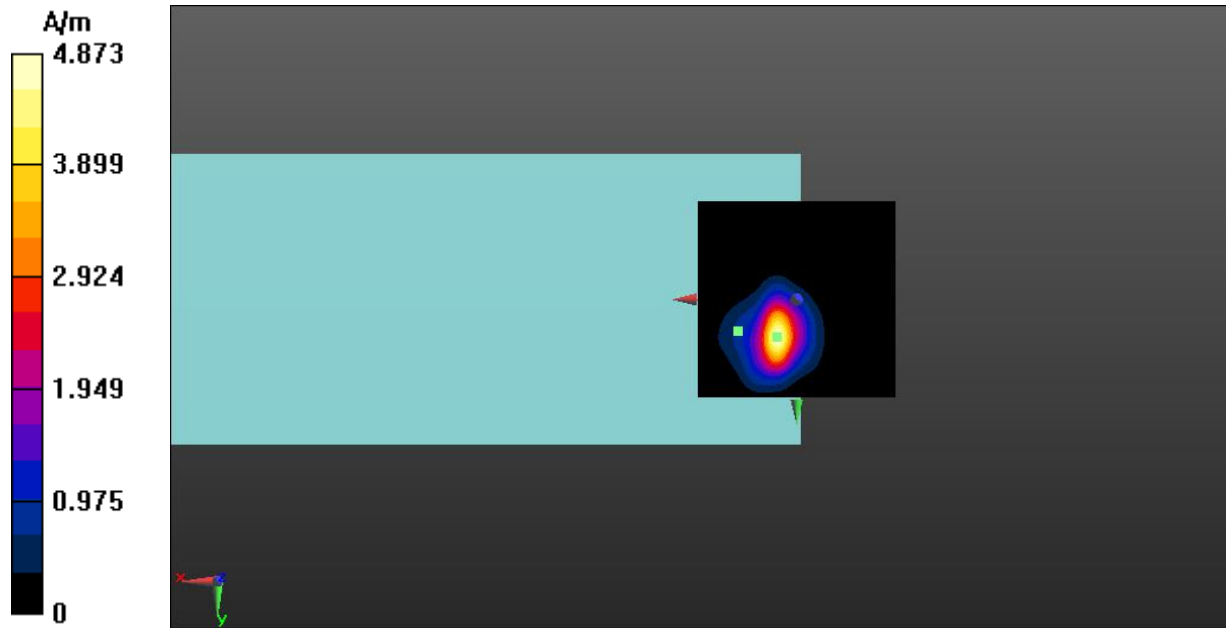


Fig A.13 T-Coil LTE-Band 41 PC3-Z



T-Coil LTE-Band 41 PC3 Axial

Date: 2022-12-14

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, LTE_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.58

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 8.03 dBA/m

BWC Factor = 0.16 dB

Location: 15, 13.5, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 48.00 dB

ABM1 comp = 0.69 dBA/m

BWC Factor = 0.16 dB

Location: 0, -0.5, 3.7 mm

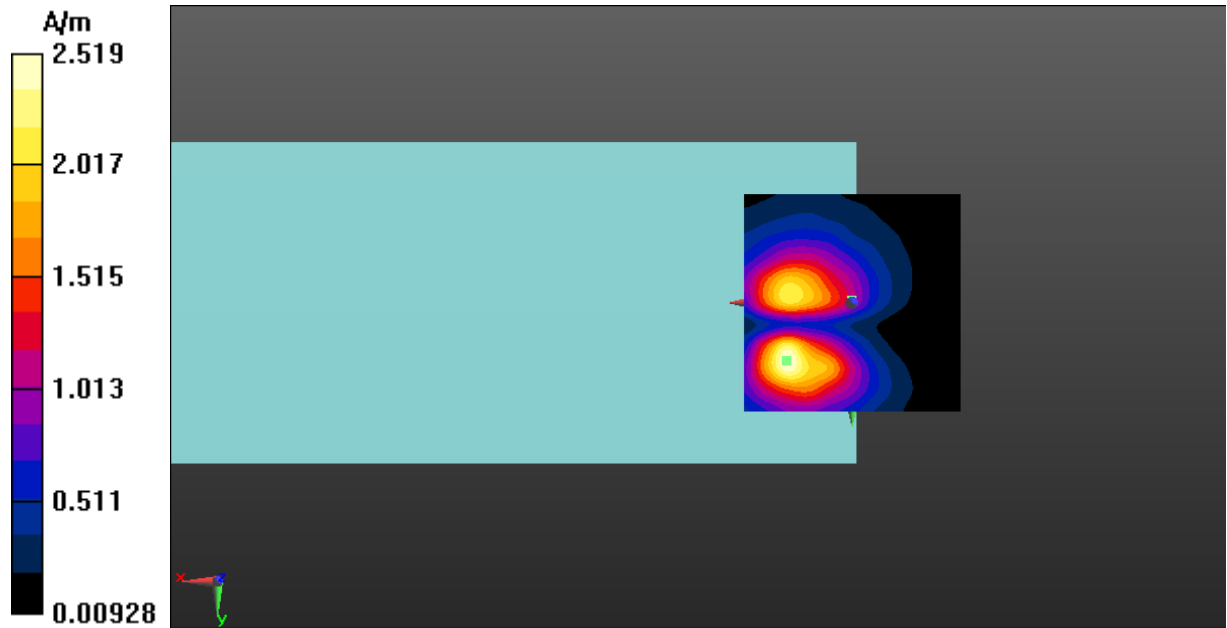


Fig A.13 T-Coil LTE-Band 41 PC3-Y



T-Coil LTE-Band 41 PC2 Axial

Date: 2022-12-14

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, LTE TDD HPUE (0) Frequency: 2593 MHz Duty Cycle: 1:2.31

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 13.48 dBA/m

BWC Factor = 0.16 dB

Location: 15, 8, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000

mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.37 dB

ABM1 comp = 8.20 dBA/m

BWC Factor = 0.16 dB

Location: 5, 10, 3.7 mm

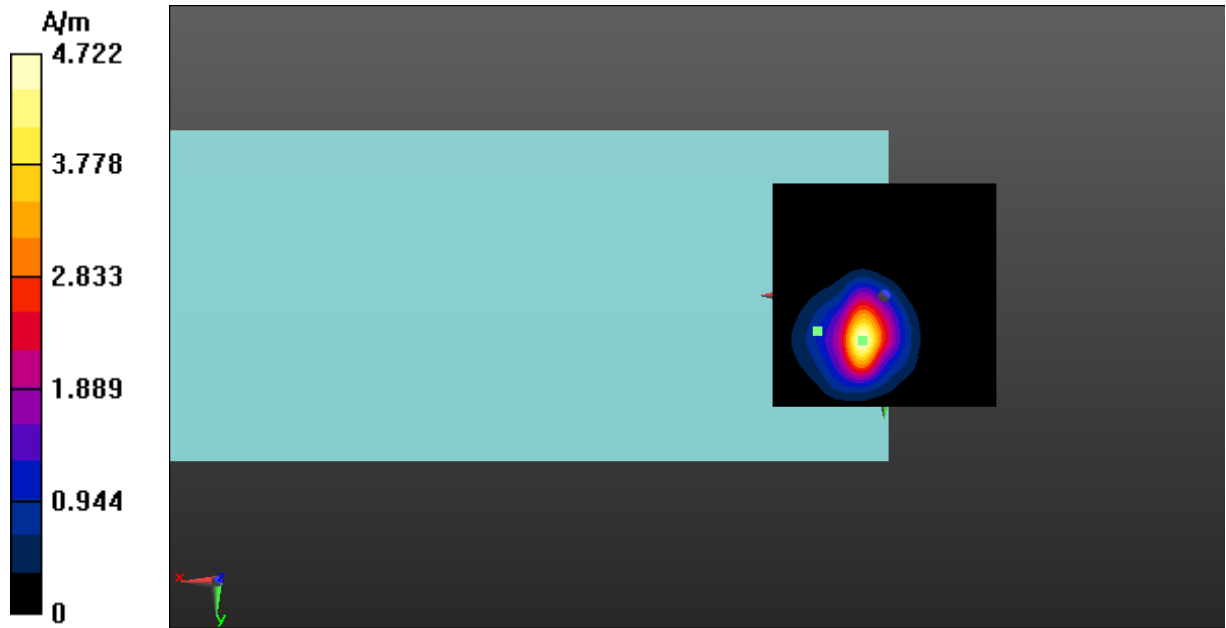


Fig A.14 T-Coil LTE-Band 41 PC2-Z



T-Coil LTE-Band 41 PC2 Axial

Date: 2022-12-14

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, LTE TDD HPUE (0) Frequency: 2593 MHz Duty Cycle: 1:2.31

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 7.62 dBA/m

BWC Factor = 0.16 dB

Location: 14, 14, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 49.11 dB

ABM1 comp = 0.62 dBA/m

BWC Factor = 0.16 dB

Location: 0.5, -0.5, 3.7 mm

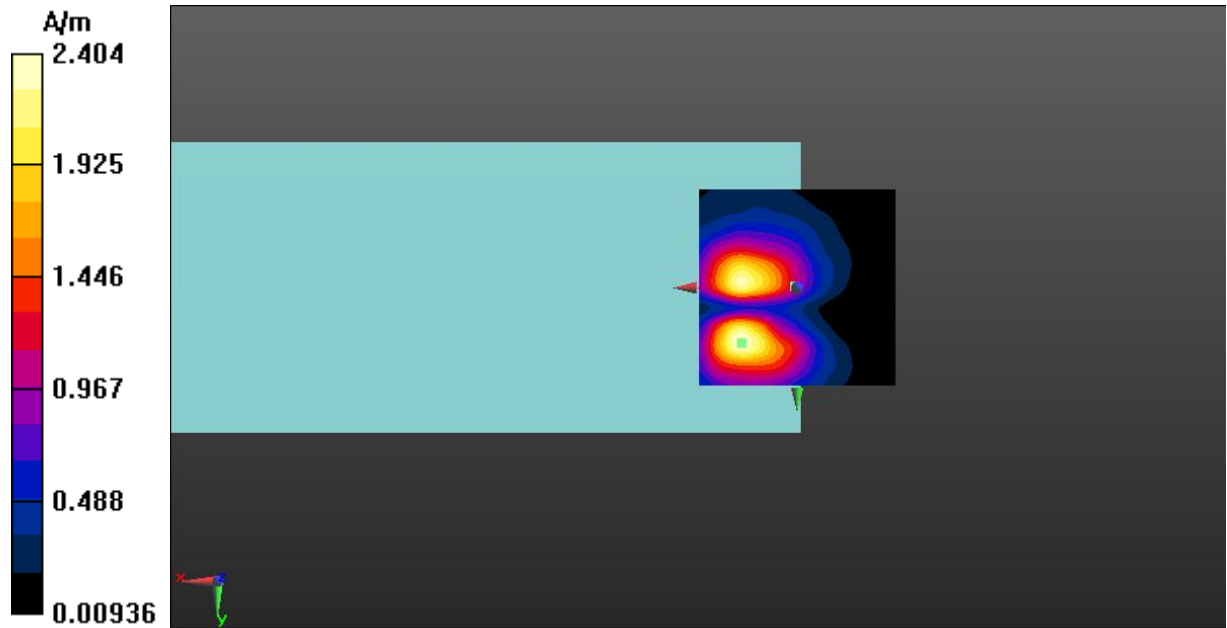


Fig A.14 T-Coil LTE-Band 41 PC2-Y



T-Coil WLAN 2.4GHz Axial

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 13.25 dBA/m

BWC Factor = 0.16 dB

Location: 13, 6, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000

mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 54.35 dB

ABM1 comp = 6.72 dBA/m

BWC Factor = 0.16 dB

Location: 1.5, 9.5, 3.7 mm

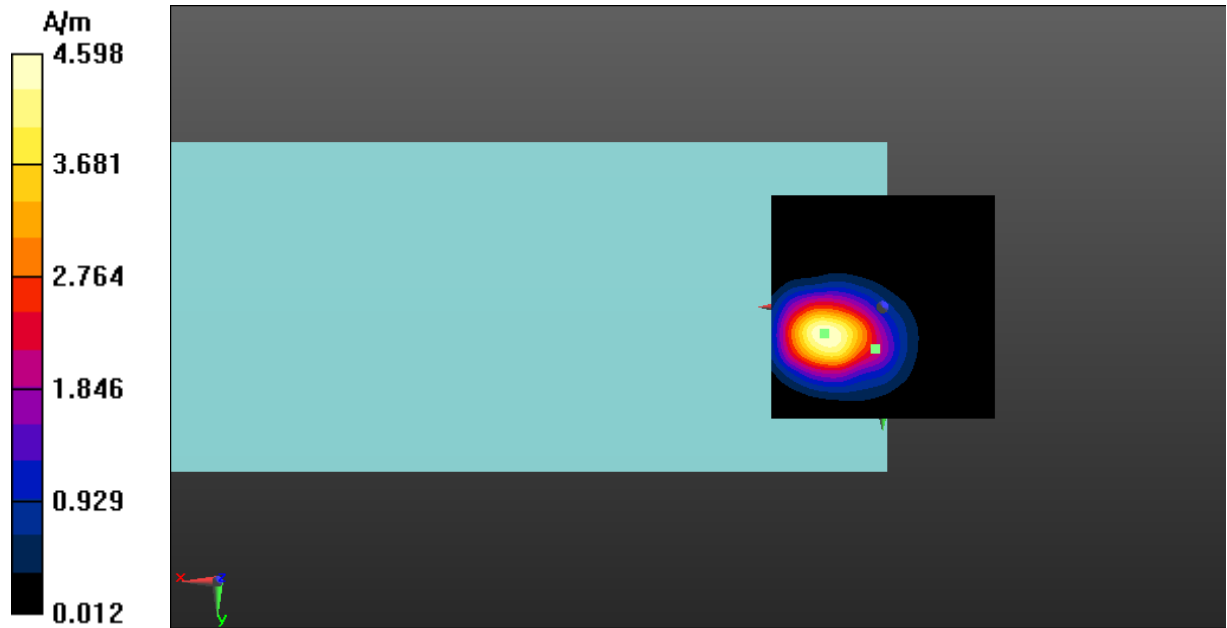


Fig A.15 T-Coil WLAN 2.4GHz-Z



T-Coil WLAN 2.4GHz Transverse

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 6.33 dBA/m

BWC Factor = 0.16 dB

Location: 14, 16, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.24 dB

ABM1 comp = 3.21 dBA/m

BWC Factor = 0.16 dB

Location: 5, 16, 3.7 mm

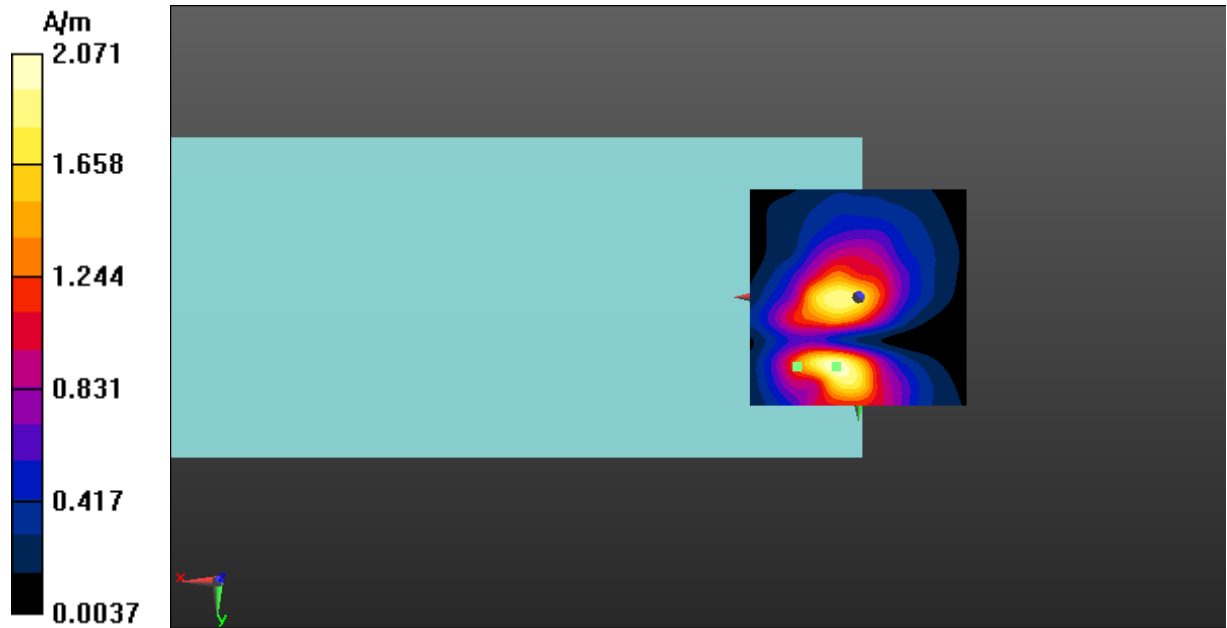


Fig A.15 T-Coil WLAN 2.4GHz-Y



T-Coil WLAN 5.2GHz Axial

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5200 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.61 dBA/m

BWC Factor = 0.16 dB

Location: 14, 5.5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 57.44 dB

ABM1 comp = 9.73 dBA/m

BWC Factor = 0.16 dB

Location: 4.5, 9, 3.7 mm

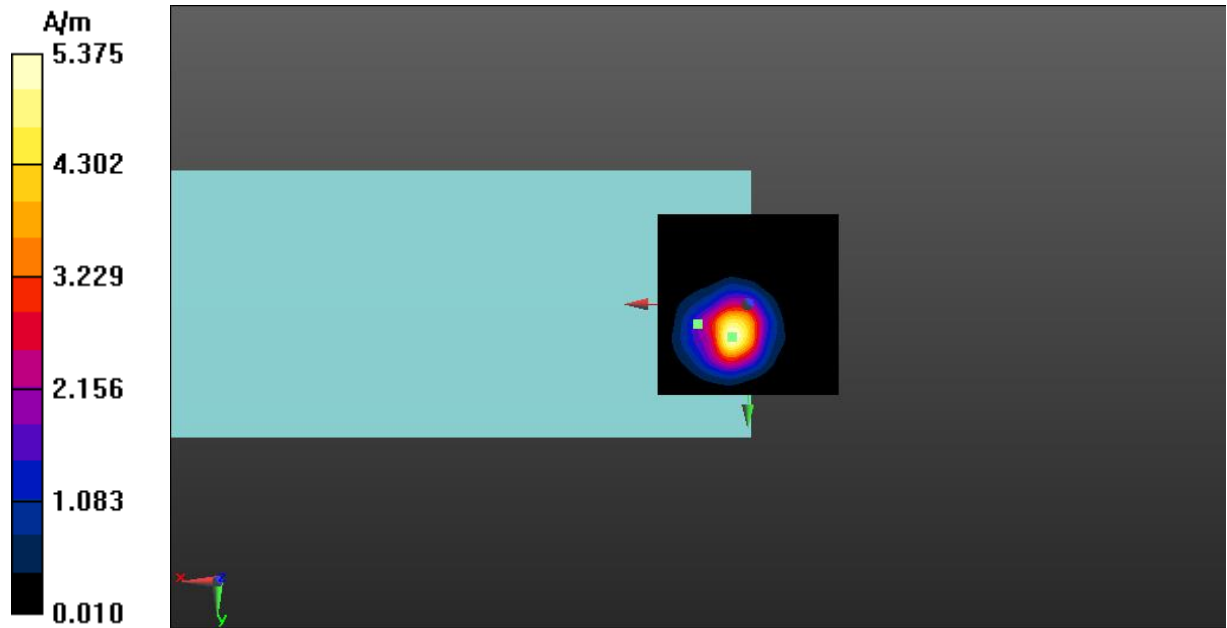


Fig A.16 T-Coil WLAN 5.2GHz-Z



T-Coil WLAN 5.2GHz Transverse

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5200 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 5.54 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, -0.5, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.64 dB

ABM1 comp = 3.83 dBA/m

BWC Factor = 0.16 dB

Location: 8, 1, 3.7 mm

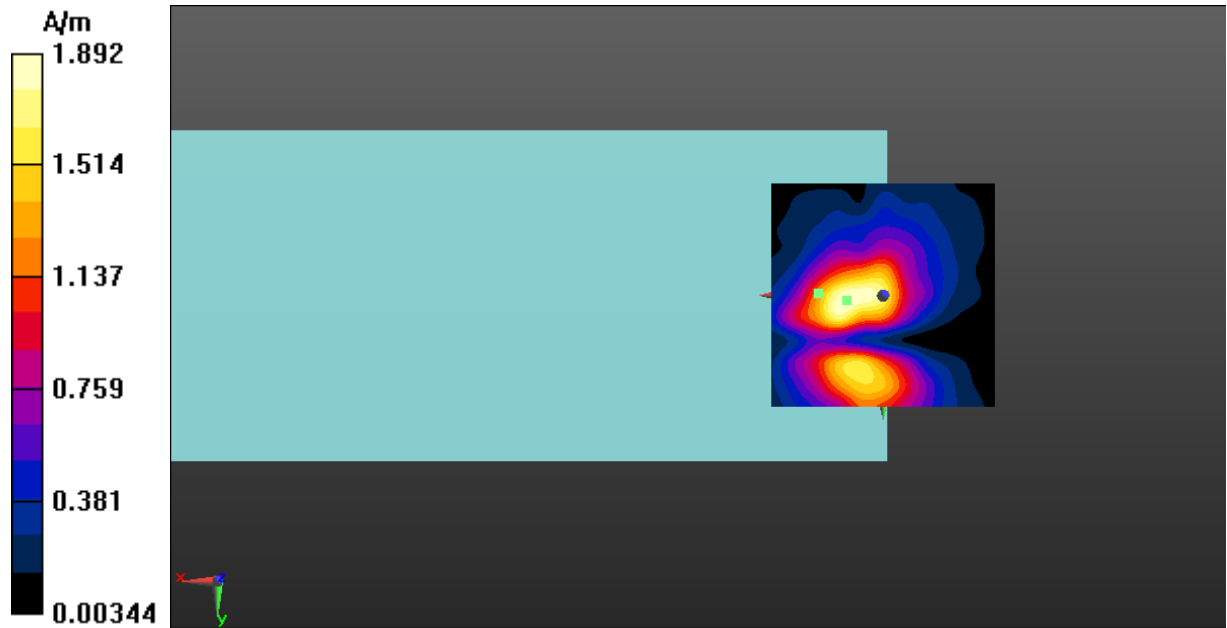


Fig A.16 T-Coil WLAN 5.2GHz-Y



T-Coil WLAN 5.3GHz Axial

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5280 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.29 dBA/m

BWC Factor = 0.16 dB

Location: 13.5, 5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000

mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 56.22 dB

ABM1 comp = 9.66 dBA/m

BWC Factor = 0.16 dB

Location: 5, 9, 3.7 mm

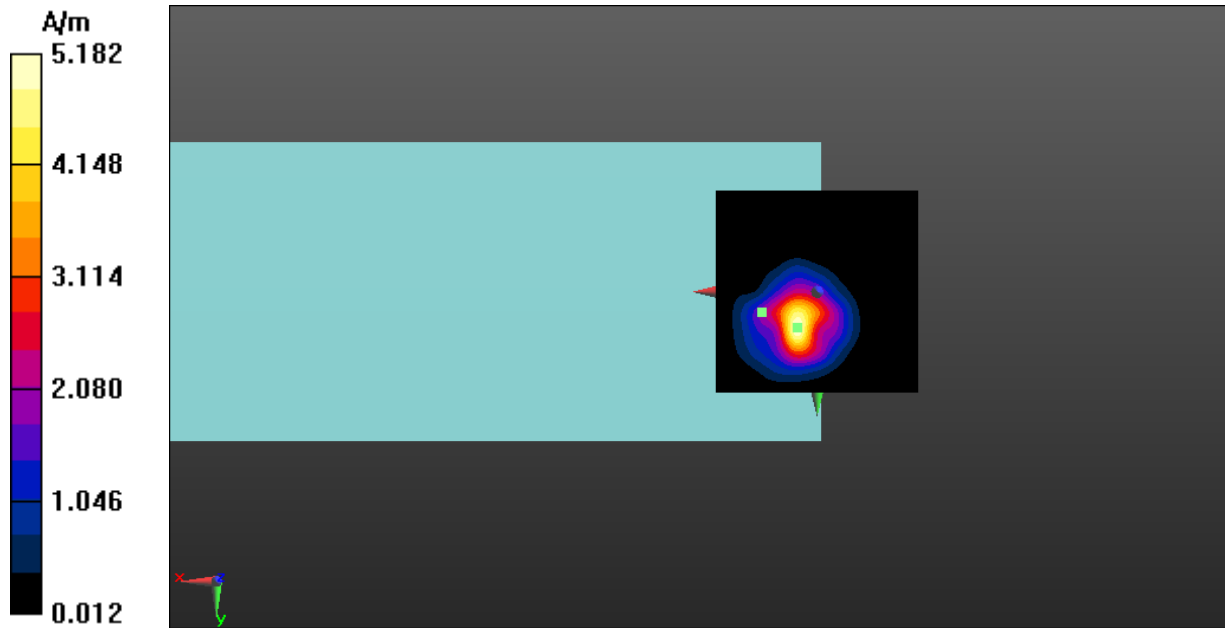


Fig A.17 T-Coil WLAN 5.3GHz-Z



T-Coil WLAN 5.3GHz Transverse

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5280 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 5.74 dBA/m

BWC Factor = 0.16 dB

Location: 15, 16, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.74 dB

ABM1 comp = 4.17 dBA/m

BWC Factor = 0.16 dB

Location: 8.5, 0, 3.7 mm

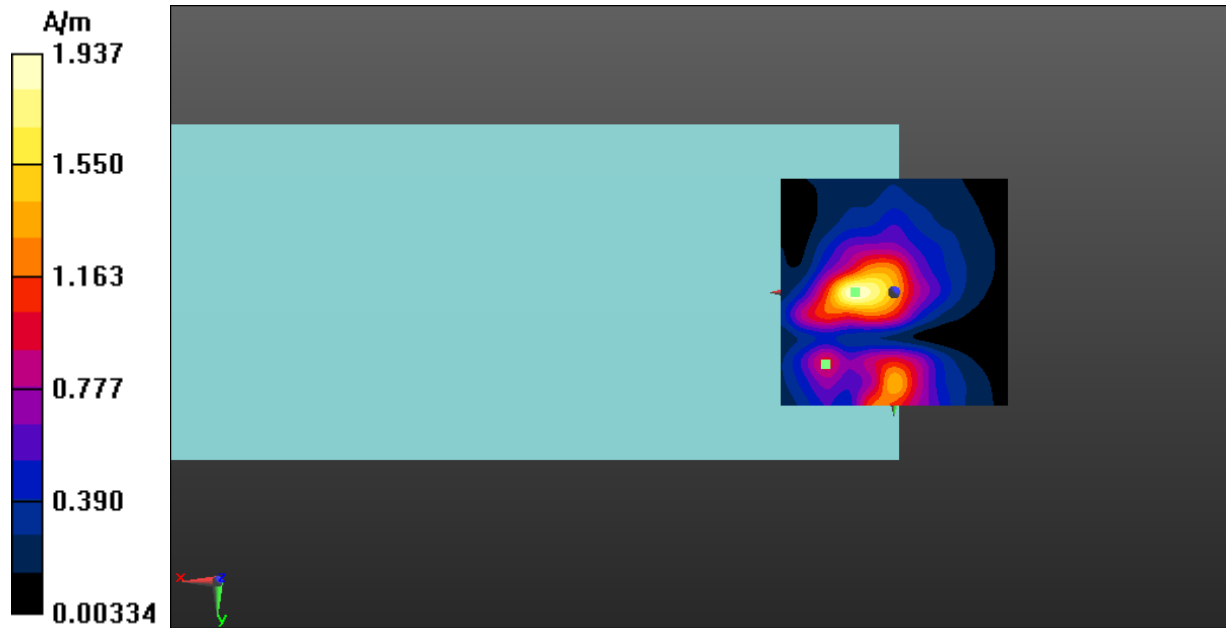


Fig A.17 T-Coil WLAN 5.3GHz-Y



T-Coil WLAN 5.5GHz Axial

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5620 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.58 dBA/m

BWC Factor = 0.16 dB

Location: 14, 5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000

mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 54.68 dB

ABM1 comp = 7.72 dBA/m

BWC Factor = 0.16 dB

Location: 4, 9, 3.7 mm

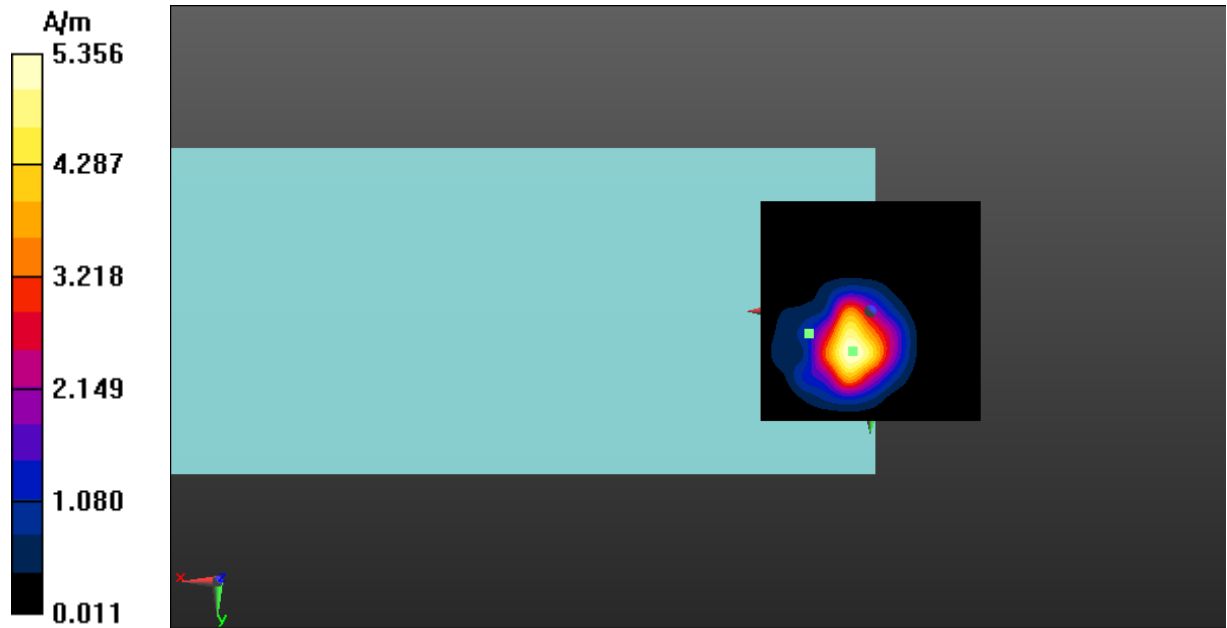


Fig A.18 T-Coil WLAN 5.5GHz-Z



T-Coil WLAN 5.5GHz Transverse

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5620 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 6.47 dBA/m

BWC Factor = 0.16 dB

Location: 15, 0, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 49.91 dB

ABM1 comp = 3.67 dBA/m

BWC Factor = 0.16 dB

Location: 9, 2, 3.7 mm

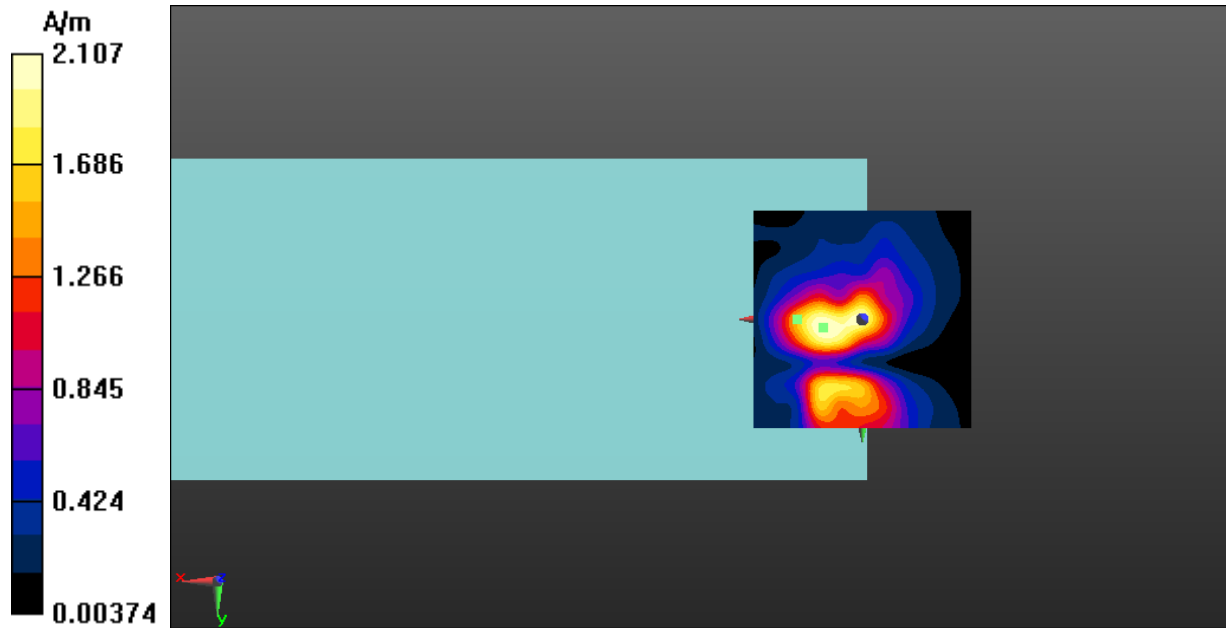


Fig A.18 T-Coil WLAN 5.5GHz-Y



T-Coil WLAN 5.8GHz Axial

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5785 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.31 dBA/m

BWC Factor = 0.16 dB

Location: 14, 5.5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 54.54 dB

ABM1 comp = 7.87 dBA/m

BWC Factor = 0.16 dB

Location: 4.5, 8.5, 3.7 mm

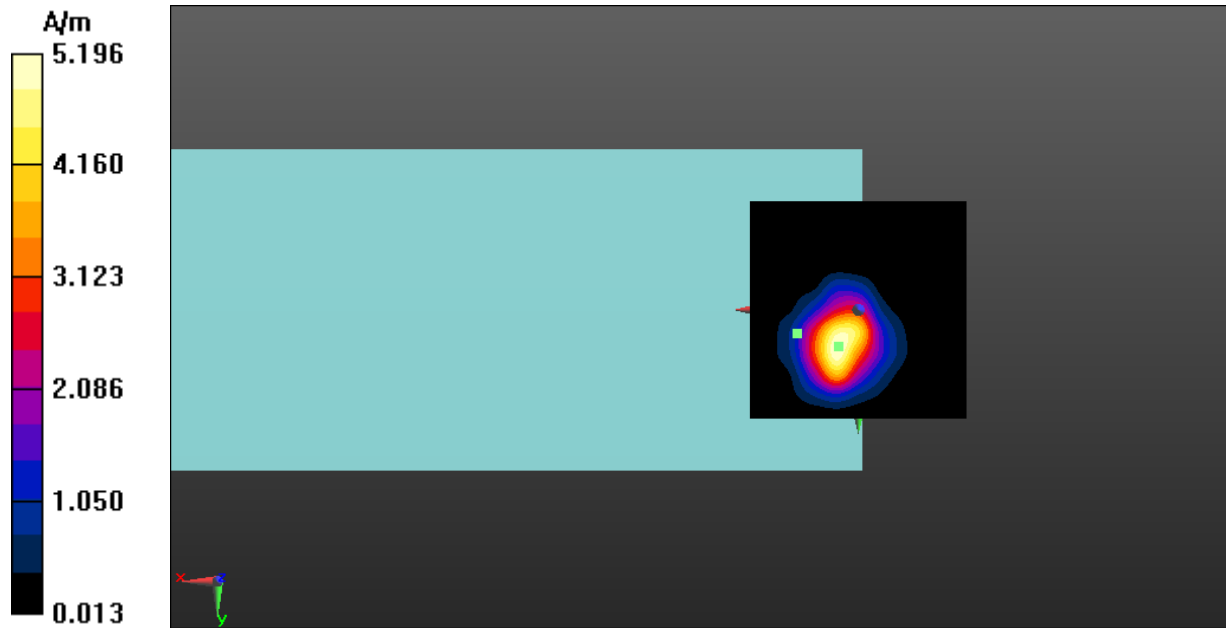


Fig A.19 T-Coil WLAN 5.8GHz-Z



T-Coil WLAN 5.8GHz Transverse

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5785 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 5.99 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 0, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 50.86 dB

ABM1 comp = 4.50 dBA/m

BWC Factor = 0.16 dB

Location: 9.5, 0.5, 3.7 mm

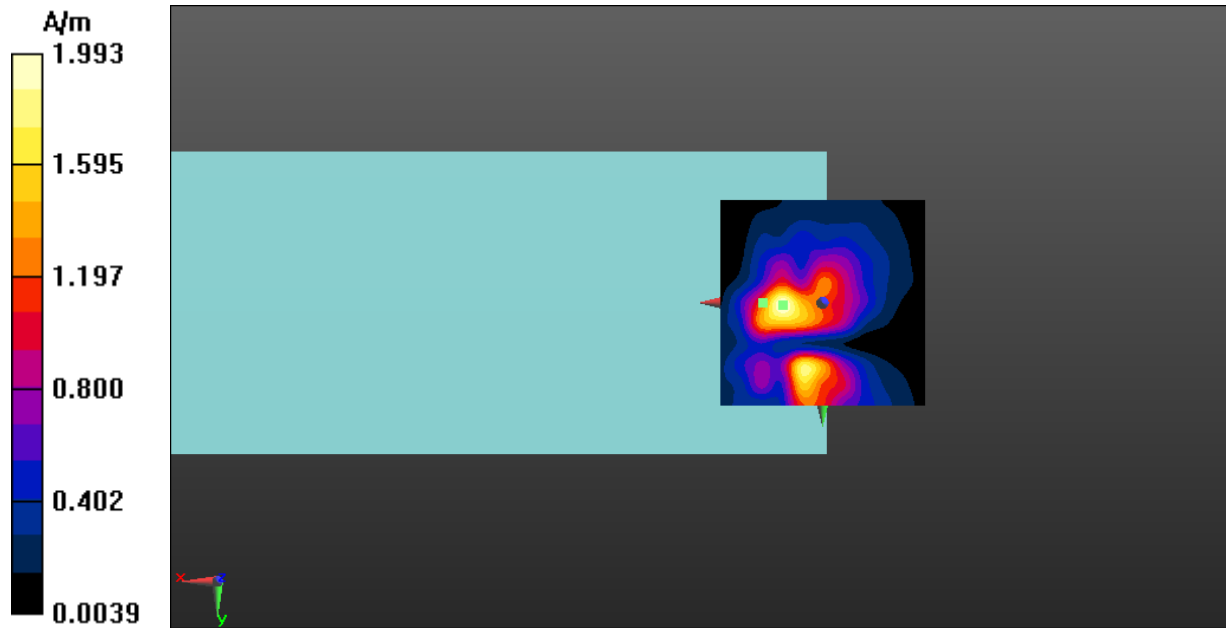


Fig A.19 T-Coil WLAN 5.8GHz-Y



T-Coil (Google Duo) EDGE 850 Axial

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, EDGE 2Tx (0) Frequency: 836.6 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 37.15

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 13.72 dBA/m

BWC Factor = 0.16 dB

Location: 14, 6.5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 37.15

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 46.52 dB

ABM1 comp = 4.84 dBA/m

BWC Factor = 0.16 dB

Location: 0.5, 6, 3.7 mm

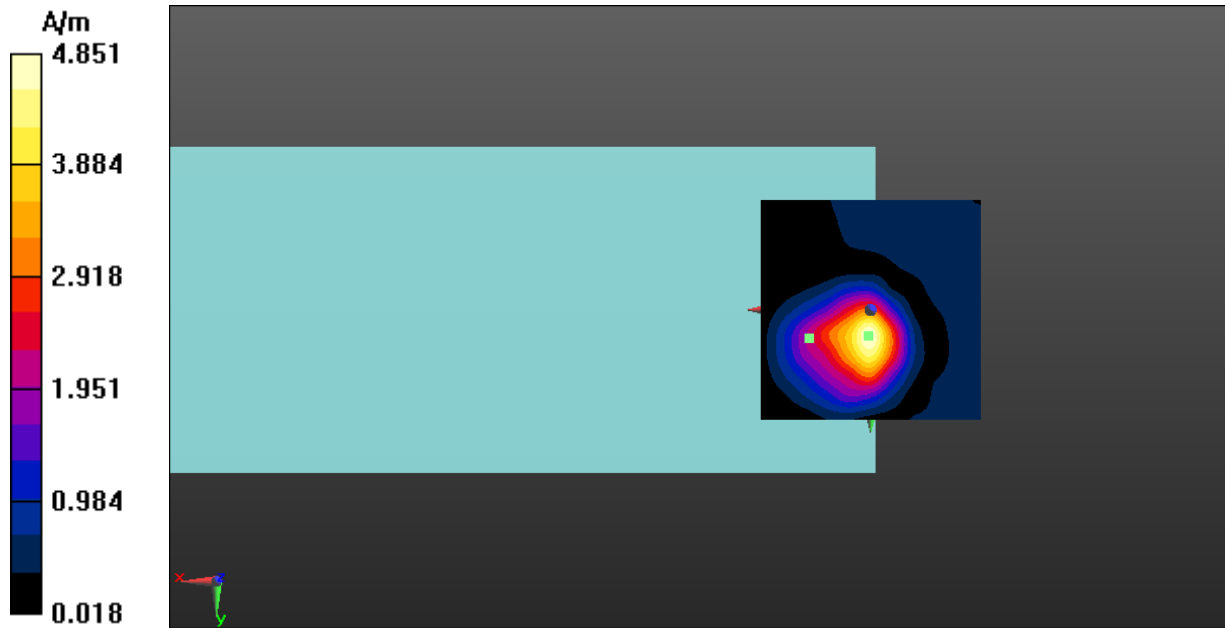


Fig A.20 T-Coil EDGE 850-Z



T-Coil (Google Duo) EDGE 850 Transverse

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, EDGE 2Tx (0) Frequency: 836.6 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 37.15

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 5.84 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 0, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 37.15

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 48.86 dB

ABM1 comp = 3.07 dBA/m

BWC Factor = 0.16 dB

Location: 7.5, 1.5, 3.7 mm

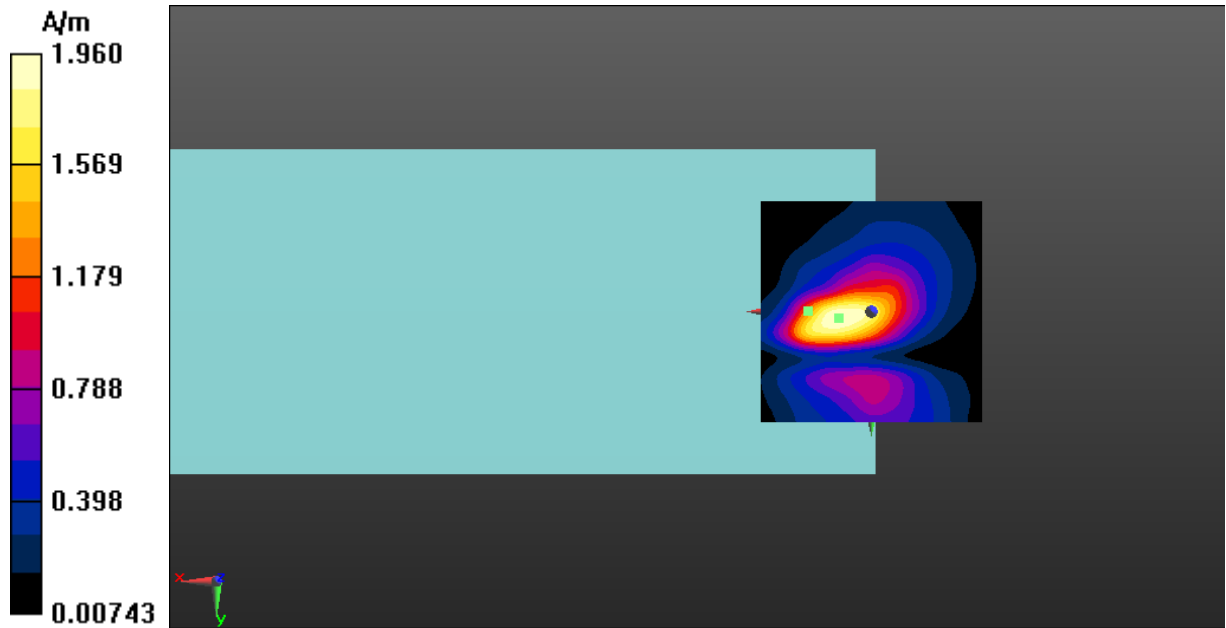


Fig A.20 T-Coil EDGE 850-Y



T-Coil (Google Duo) WCDMA Band 2 Axial

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 13.98 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 8, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 46.54 dB

ABM1 comp = 4.83 dBA/m

BWC Factor = 0.16 dB

Location: 0.5, 6.5, 3.7 mm

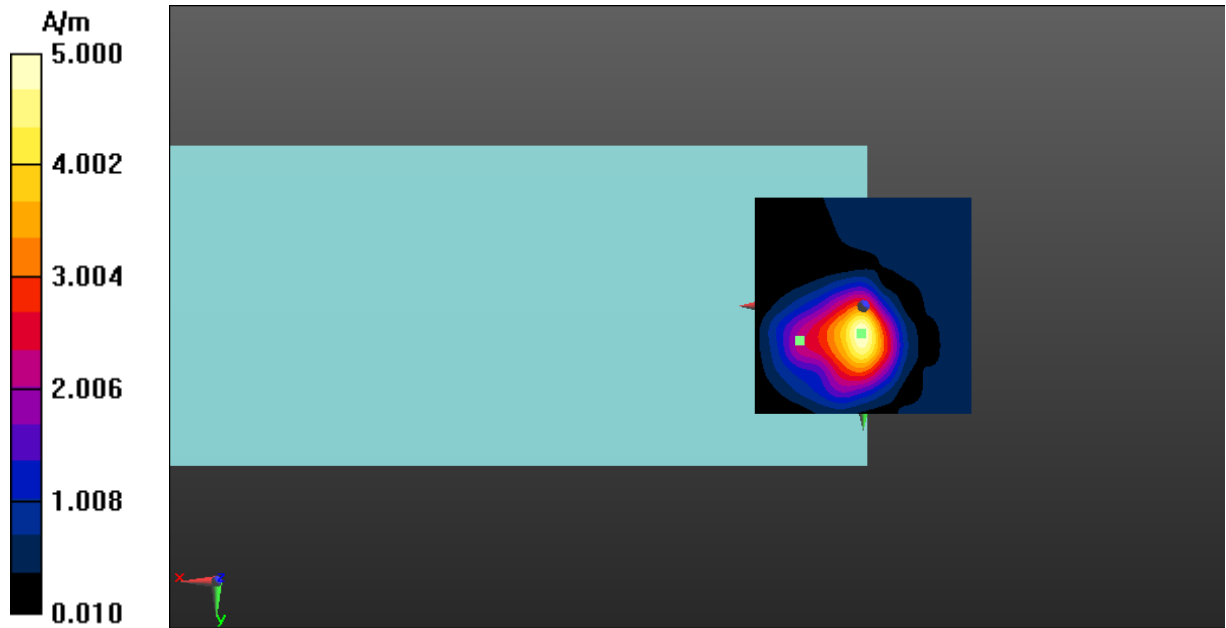


Fig A.21 T-Coil WCDMA Band 2-Z



T-Coil (Google Duo) WCDMA Band 2 Transverse

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 5.41 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 16, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 49.30 dB

ABM1 comp = 1.96 dBA/m

BWC Factor = 0.16 dB

Location: 6, 3, 3.7 mm

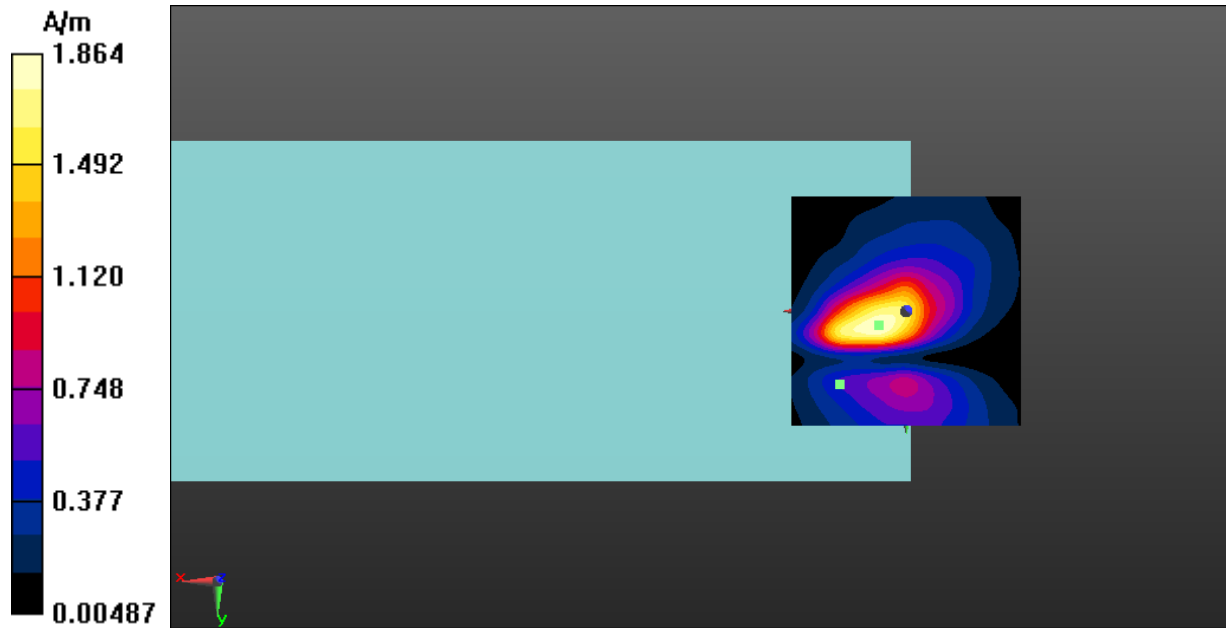


Fig A.21 T-Coil WCDMA Band 2-Y



T-Coil (Google Duo) LTE-Band 41 PC3 Axial

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, LTE_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.58

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.38 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 6, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 45.69 dB

ABM1 comp = 5.68 dBA/m

BWC Factor = 0.16 dB

Location: 0.5, 6, 3.7 mm

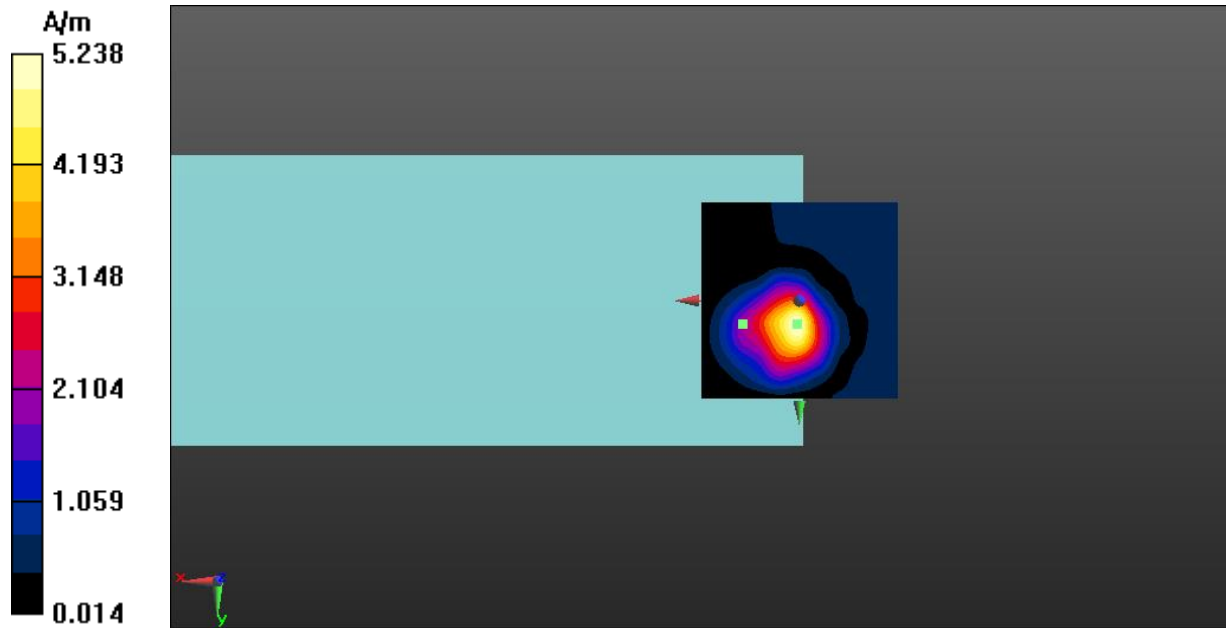


Fig A.22 T-Coil LTE-Band 41-Z



T-Coil (Google Duo) LTE-Band 41 PC3 Transverse

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, LTE_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.58

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 6.26 dBA/m

BWC Factor = 0.16 dB

Location: 15, 17.5, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 44.94 dB

ABM1 comp = 0.07 dBA/m

BWC Factor = 0.16 dB

Location: 2, 1.5, 3.7 mm

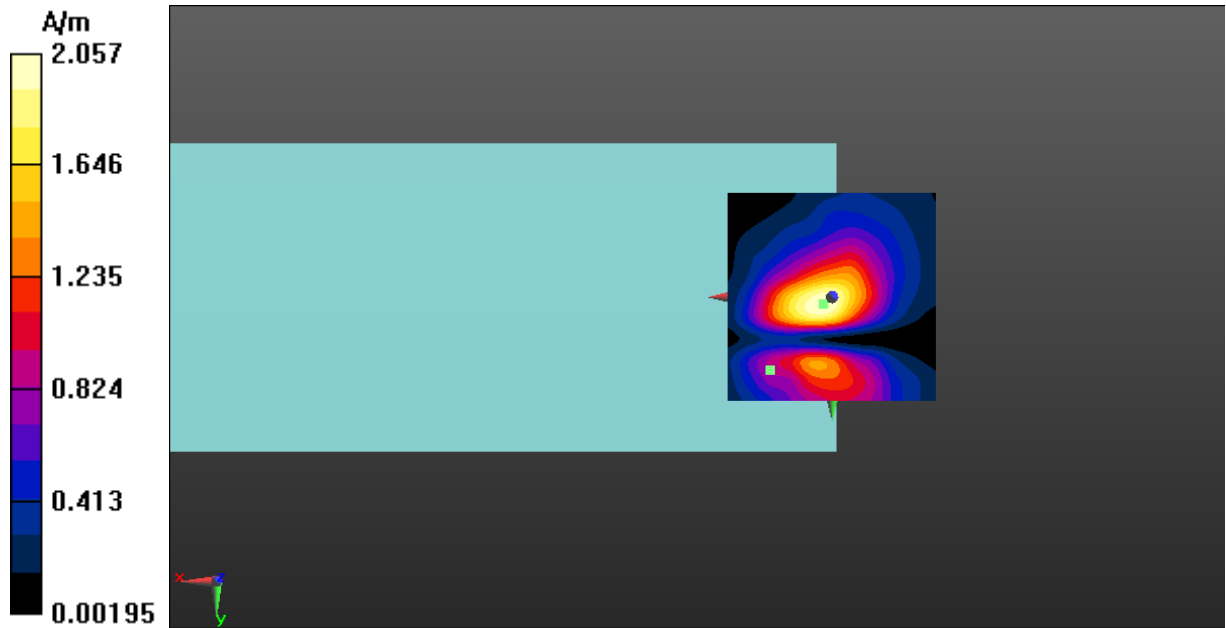


Fig A.22 T-Coil LTE-Band 41-Y



T-Coil (Google Duo) WLAN 2.4GHz Axial

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.86 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 5.5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 45.94 dB

ABM1 comp = 5.89 dBA/m

BWC Factor = 0.16 dB

Location: 0.5, 5.5, 3.7 mm

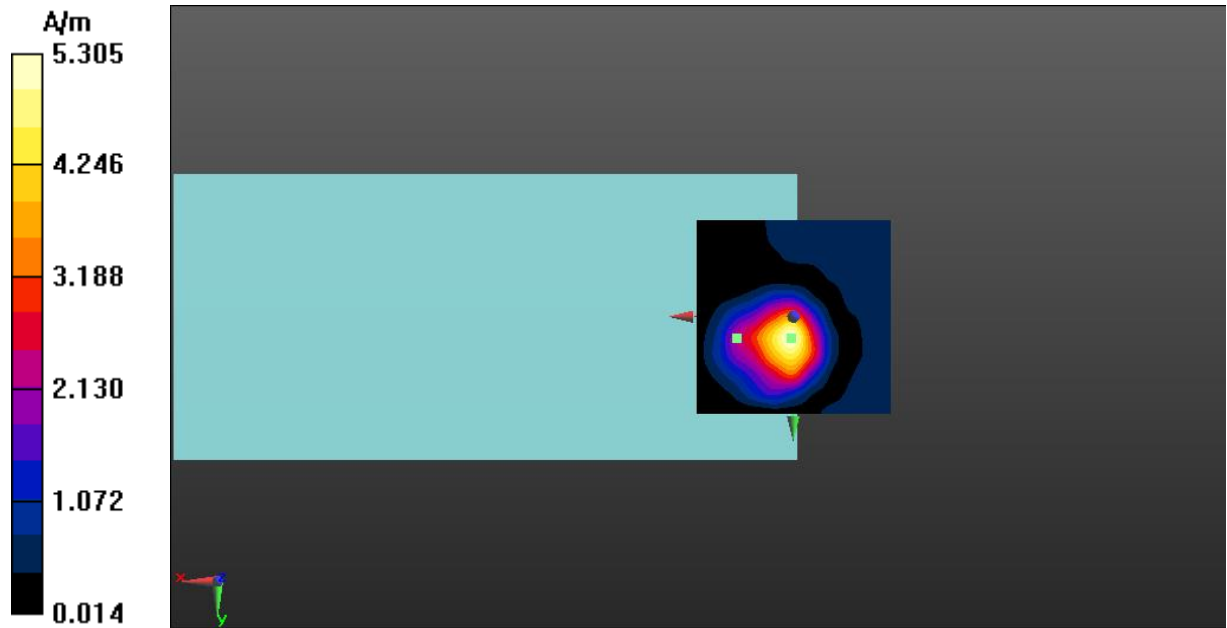


Fig A.23 T-Coil WLAN 2.4GHz-Z



T-Coil (Google Duo) WLAN 2.4GHz Transverse

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 7.12 dBA/m

BWC Factor = 0.16 dB

Location: 15, 15.5, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 53.58 dB

ABM1 comp = 2.73 dBA/m

BWC Factor = 0.16 dB

Location: 5, 1.5, 3.7 mm

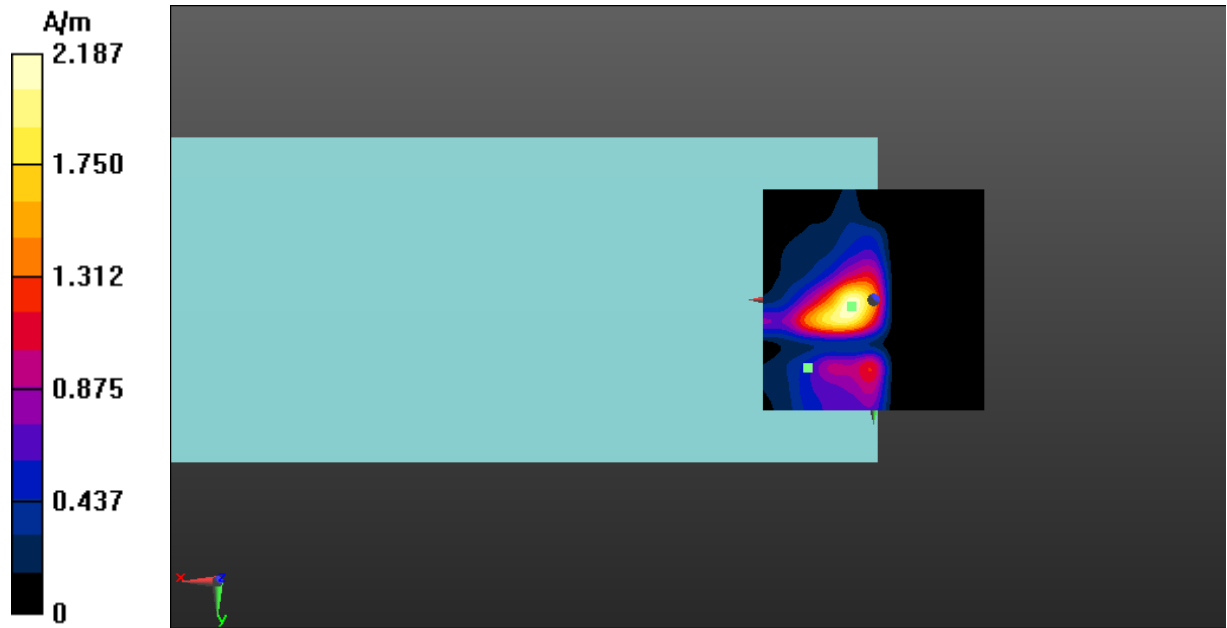


Fig A.23 T-Coil WLAN 2.4GHz-Y



T-Coil (Google Duo) WLAN 5.5GHz Axial

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5620 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

z (axial) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 14.49 dBA/m

BWC Factor = 0.16 dB

Location: 14.5, 5.5, 3.7 mm

z (axial) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 45.62 dB

ABM1 comp = 5.51 dBA/m

BWC Factor = 0.16 dB

Location: 0.5, 5.5, 3.7 mm

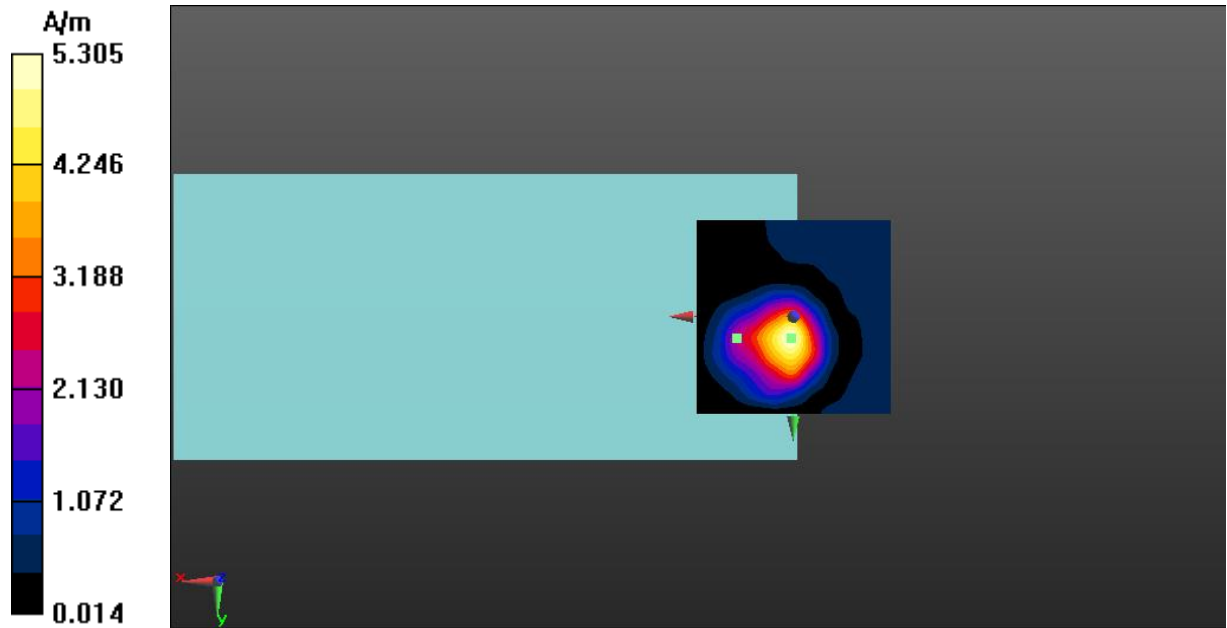


Fig A.24 T-Coil WLAN 5.5GHz-Z



T-Coil (Google Duo) WLAN 5.5GHz Transverse

Date: 2022-12-19

Electronics: DAE4 Sn1527

Medium: Air

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

Communication System: UID 0, WLAN 5G (0) Frequency: 5620 MHz Duty Cycle: 1:1

Probe: AM1DV3 - 3086

y (transversal) 4.2mm 50 x 50/ABM Interpolated Signal(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1 = 6.80 dBA/m

BWC Factor = 0.16 dB

Location: 15, 15.5, 3.7 mm

y (transversal) 4.2mm 50 x 50/ABM Interpolated SNR(x,y,z) (101x101x1): Interpolated grid:

dx=1.000 mm, dy=1.000 mm

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

Output Gain: 100

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.16 dB

Device Reference Point: 0, 0, -6.3 mm

Cursor:

ABM1/ABM2 = 52.24 dB

ABM1 comp = 2.41 dBA/m

BWC Factor = 0.16 dB

Location: 5, 1.5, 3.7 mm

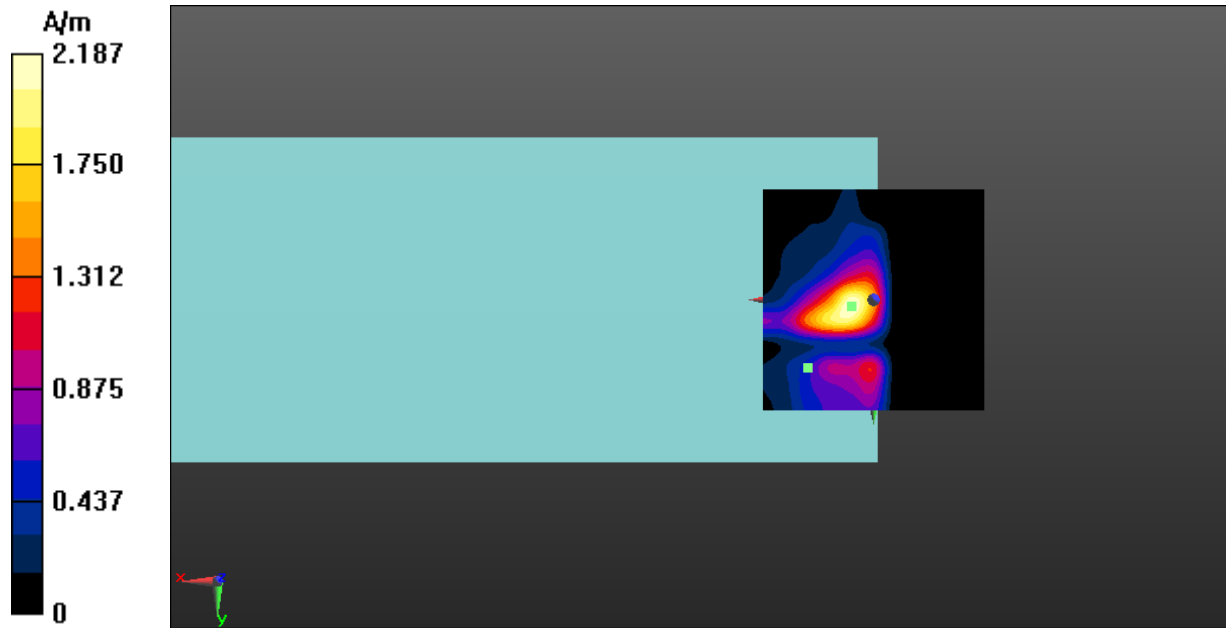


Fig A.24 T-Coil WLAN 5.5GHz-Y

ANNEX B: Frequency Response Curves

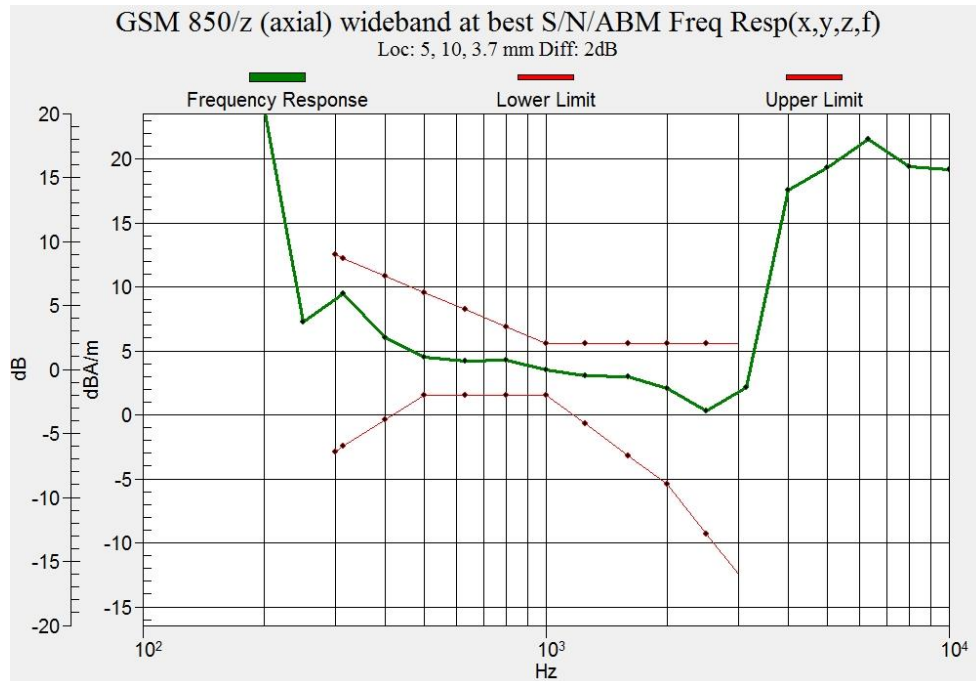


Figure B.1 Frequency Response of GSM850

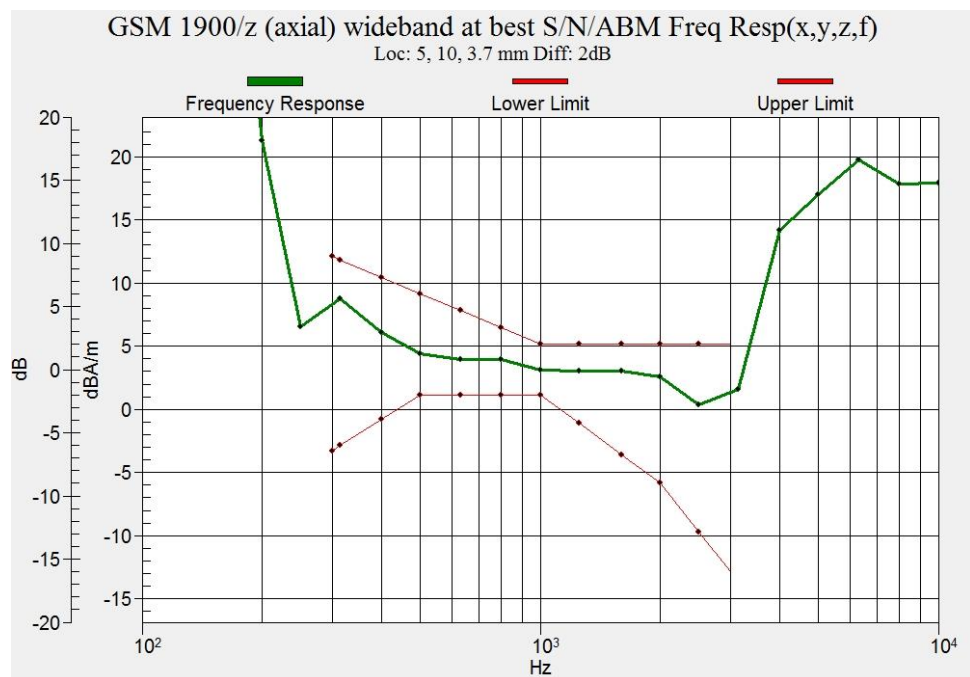


Figure B.2 Frequency Response of GSM1900

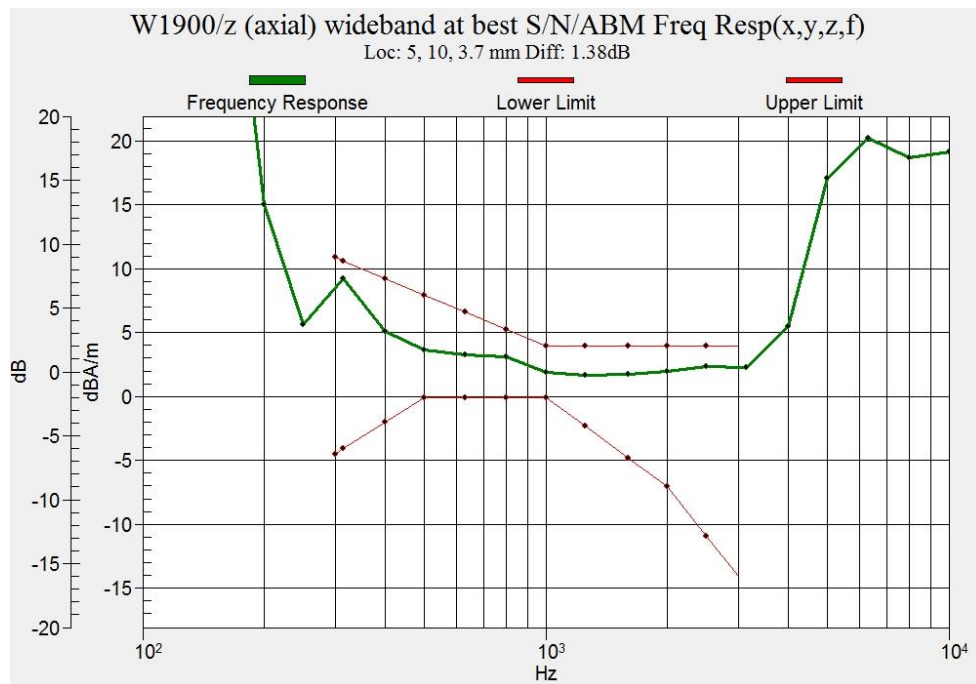


Figure B.3 Frequency Response of WCDMA Band 2

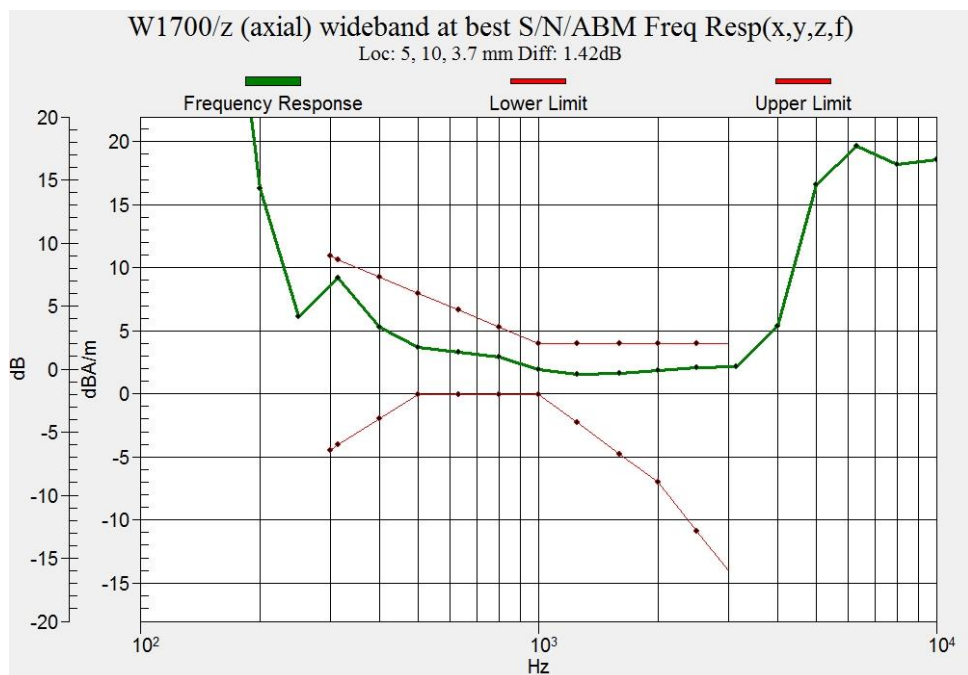


Figure B.4 Frequency Response of WCDMA Band 4

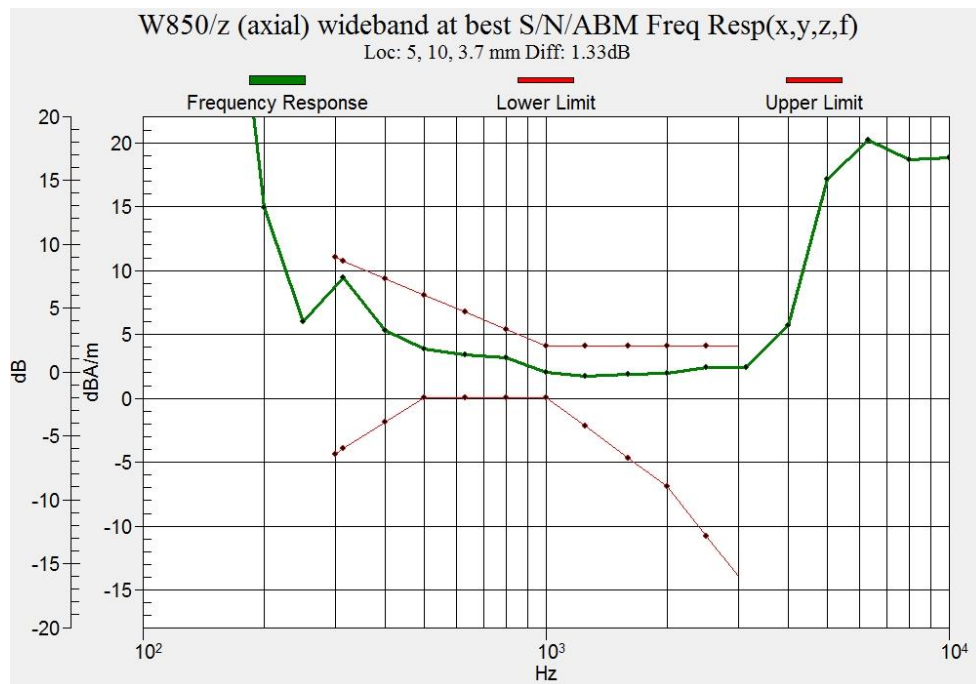


Figure B.5 Frequency Response of WCDMA Band 5

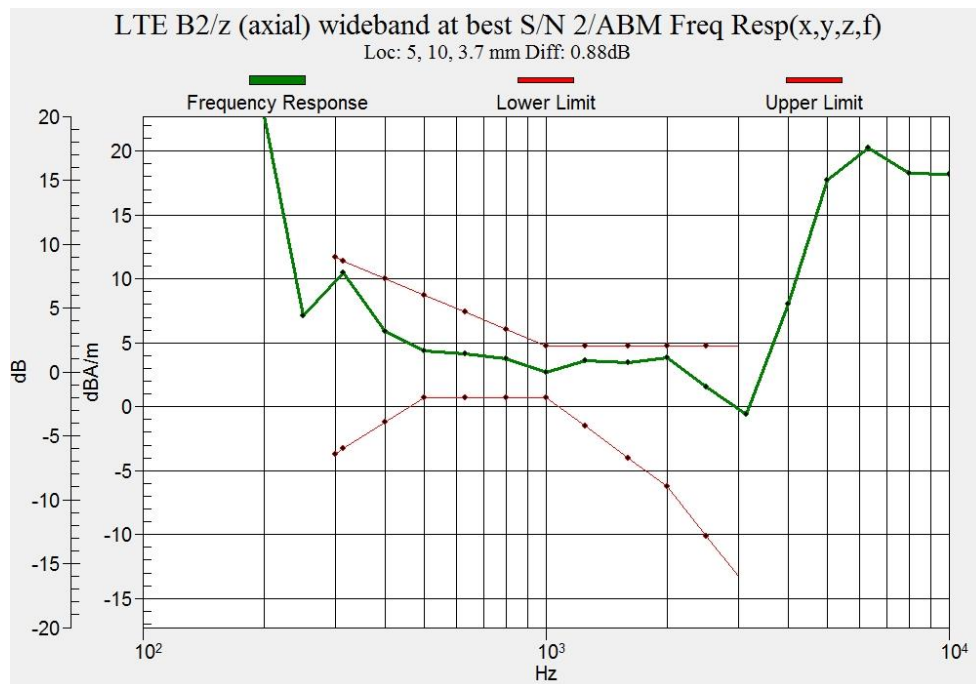


Figure B.6 Frequency Response of LTE Band 2

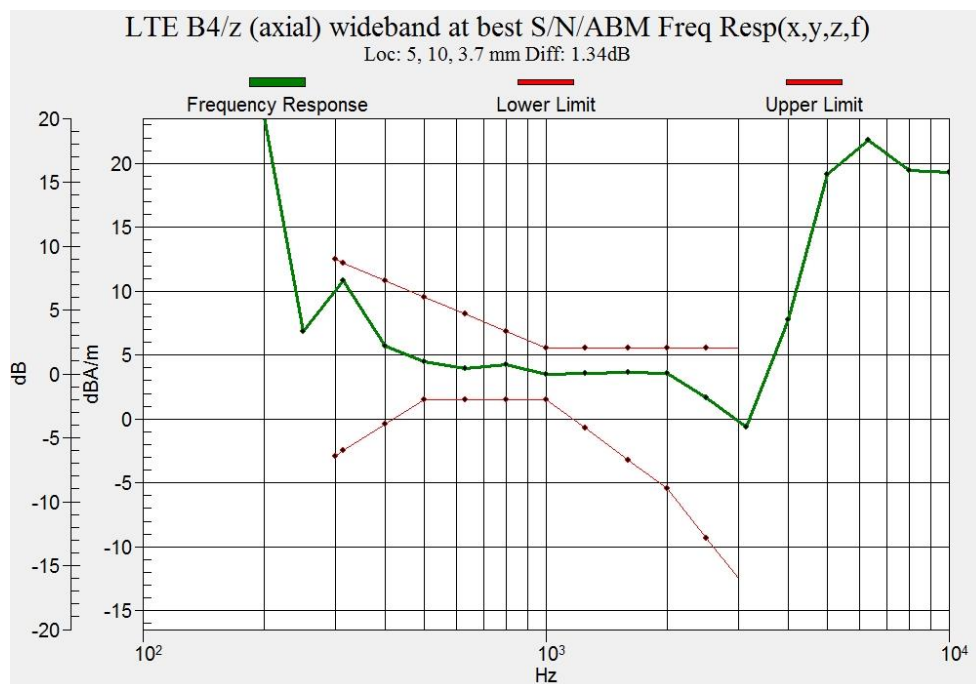


Figure B.7 Frequency Response of LTE Band 4

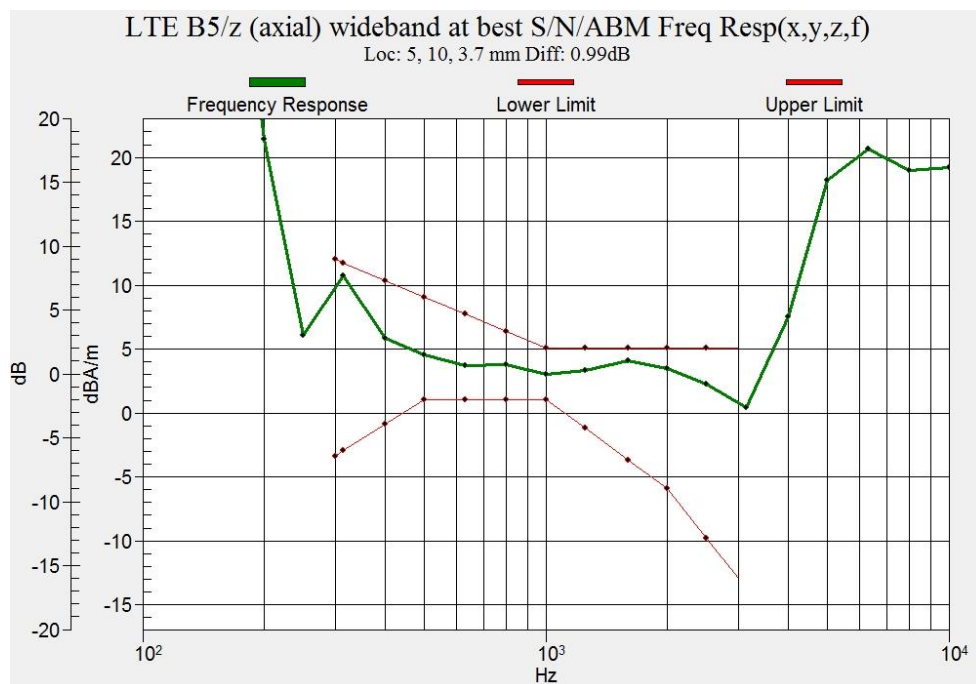


Figure B.8 Frequency Response of LTE Band 5

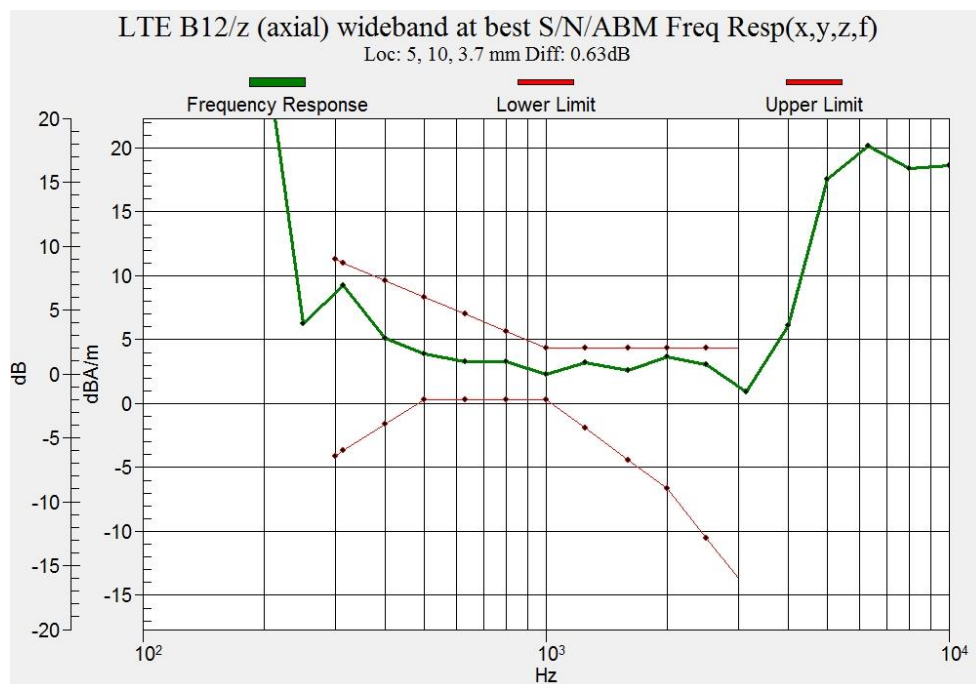


Figure B.9 Frequency Response of LTE Band 12

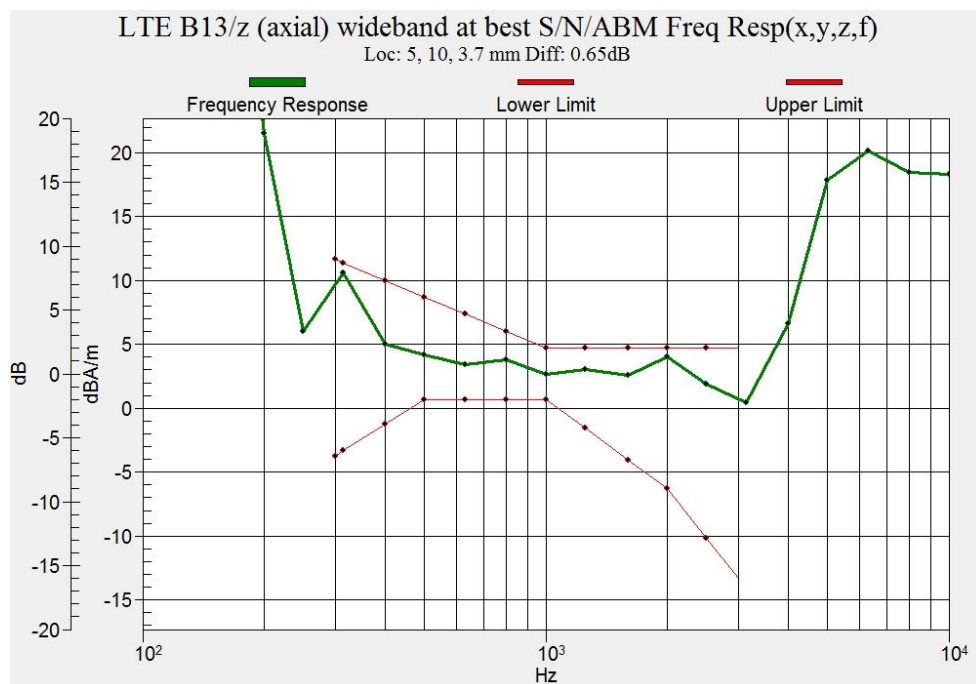


Figure B.10 Frequency Response of LTE Band 13

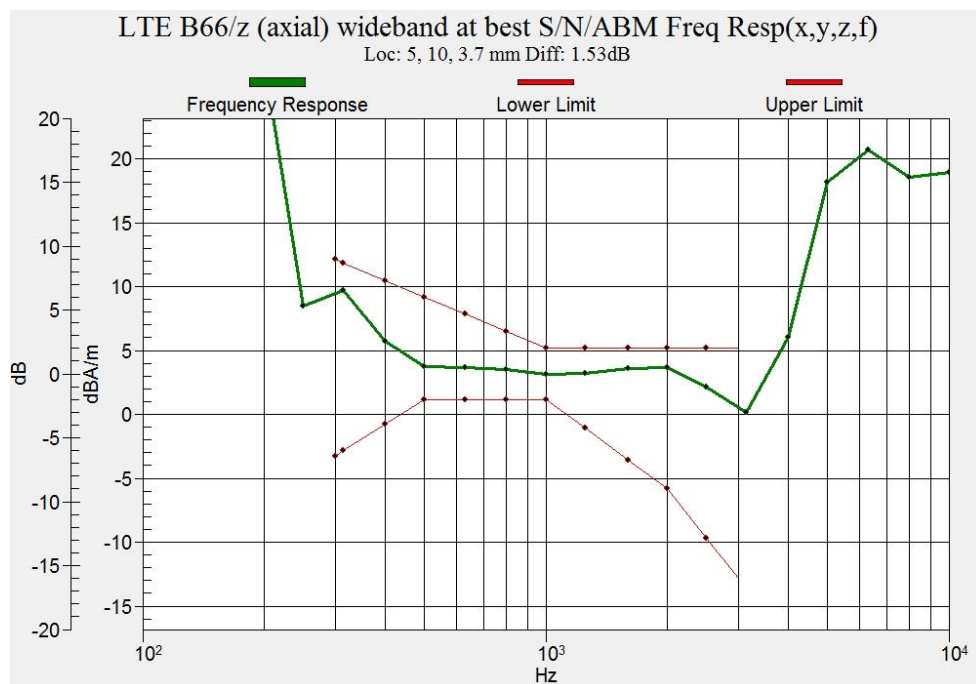


Figure B.11 Frequency Response of LTE Band 66

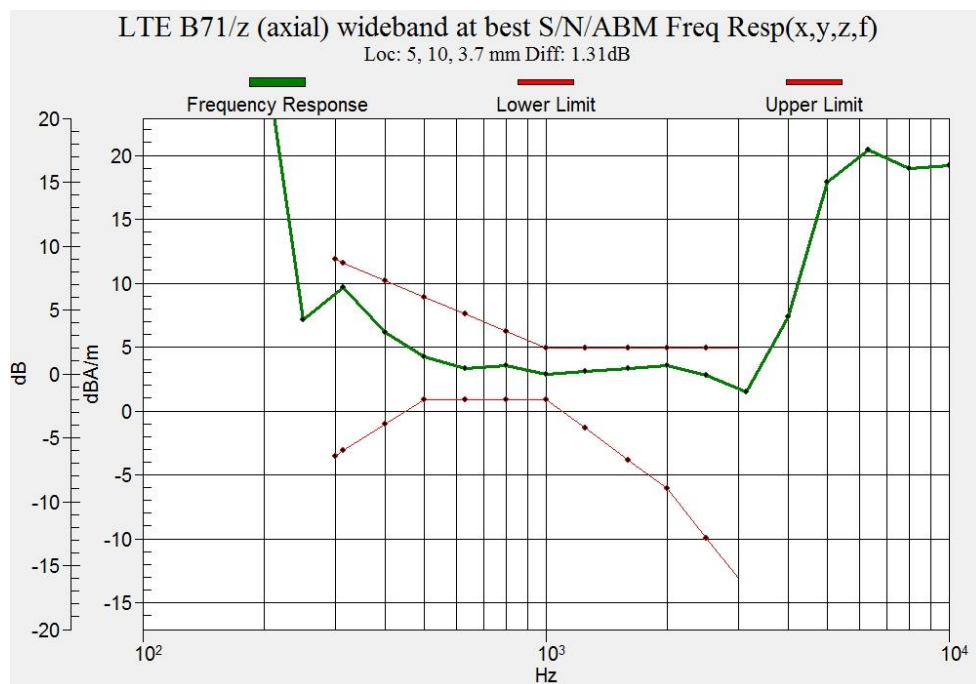


Figure B.12 Frequency Response of LTE Band 71

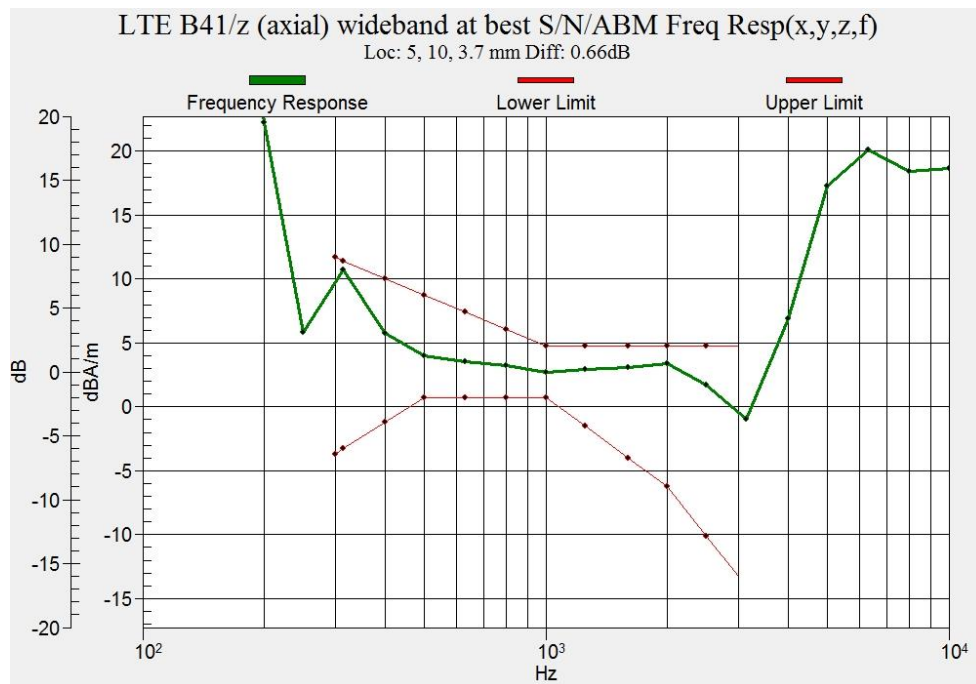


Figure B.13 Frequency Response of LTE Band 41 PC3

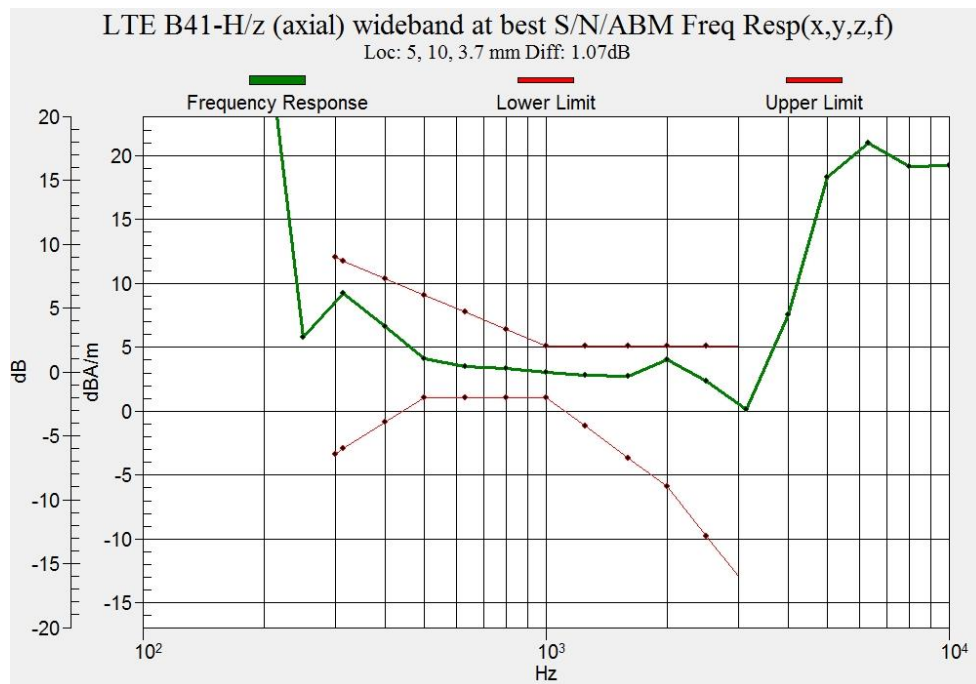


Figure B.14 Frequency Response of LTE Band 41 PC2

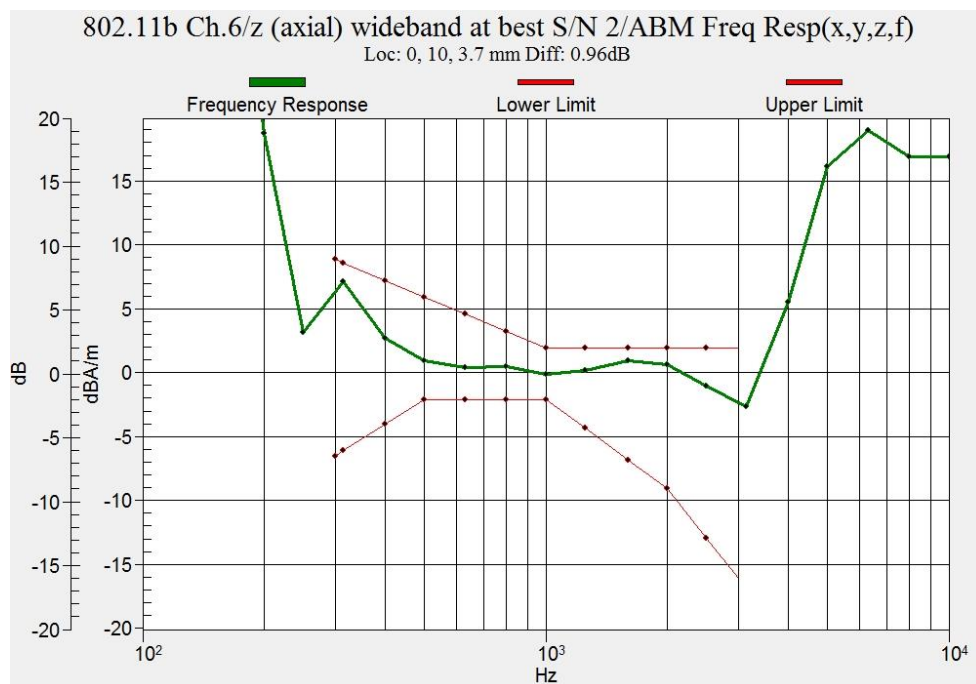


Figure B.15 Frequency Response of WLAN 2.4GHz

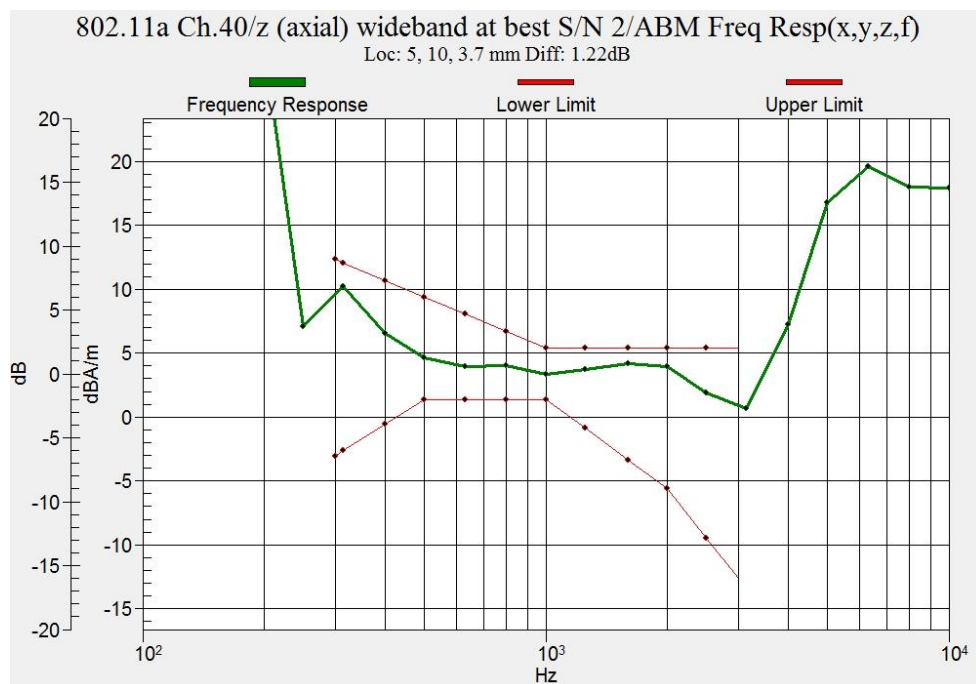


Figure B.16 Frequency Response of WLAN 5.2GHz

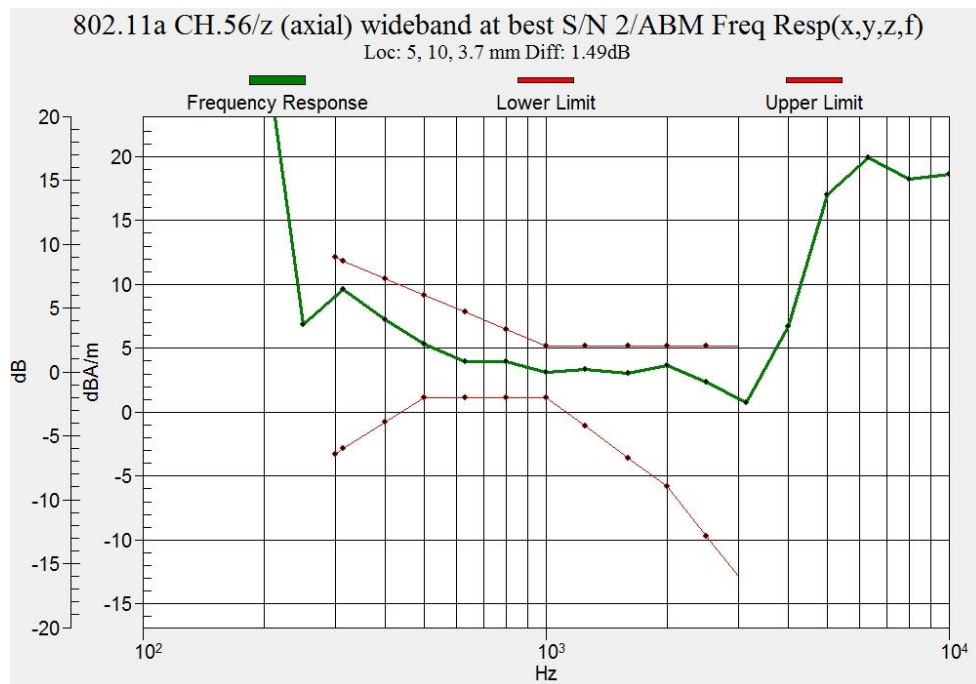


Figure B.17 Frequency Response of WLAN 5.3GHz

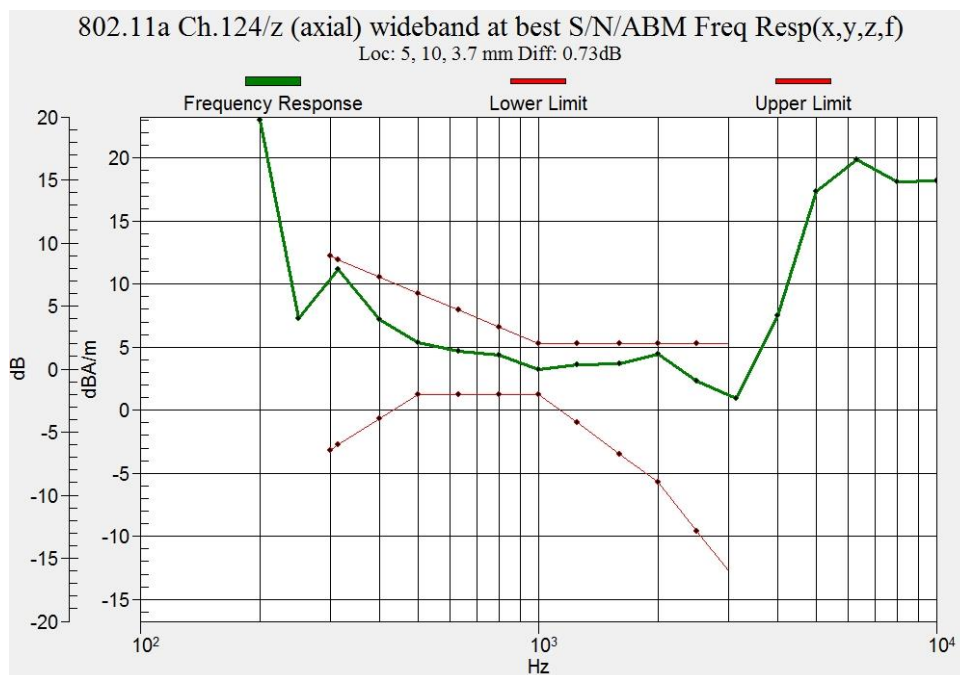


Figure B.18 Frequency Response of WLAN 5.5GHz

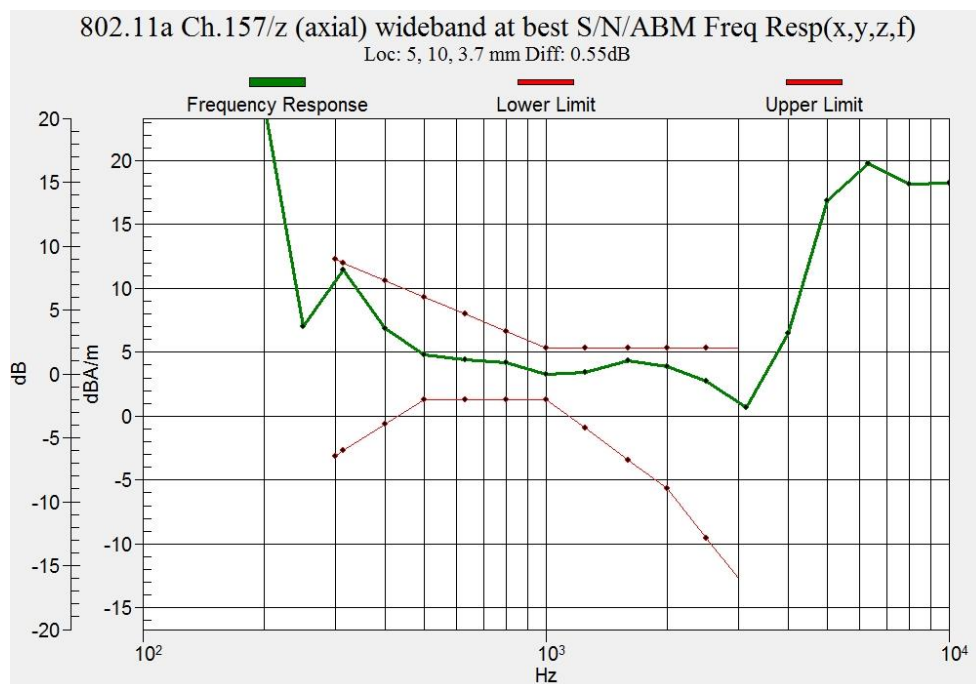


Figure B.19 Frequency Response of WLAN 5.8GHz

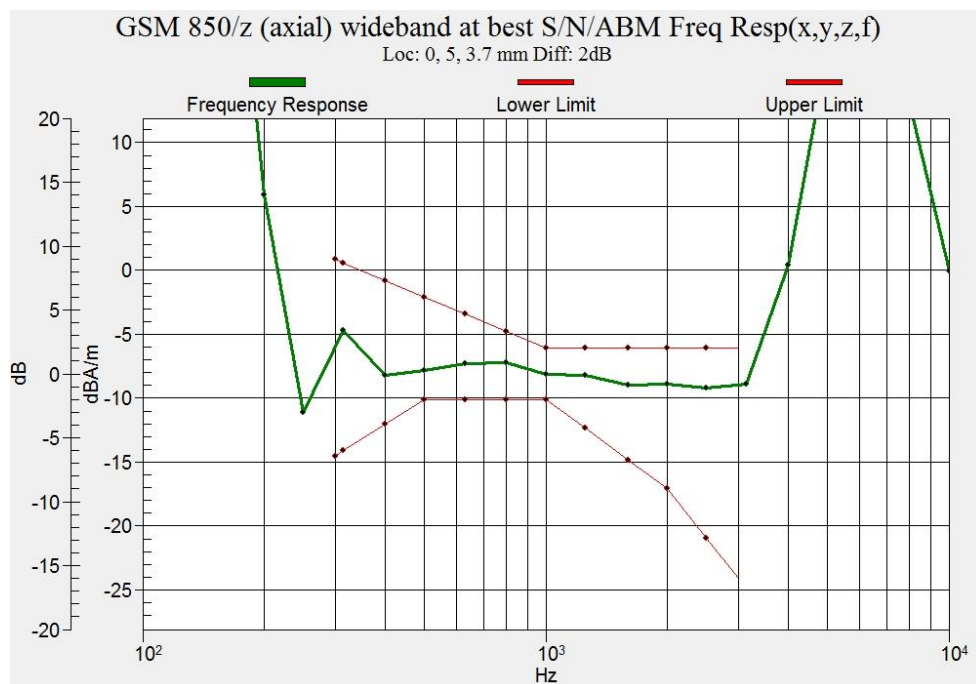


Figure B.20 Frequency Response of EDGE 850 (Google Duo)

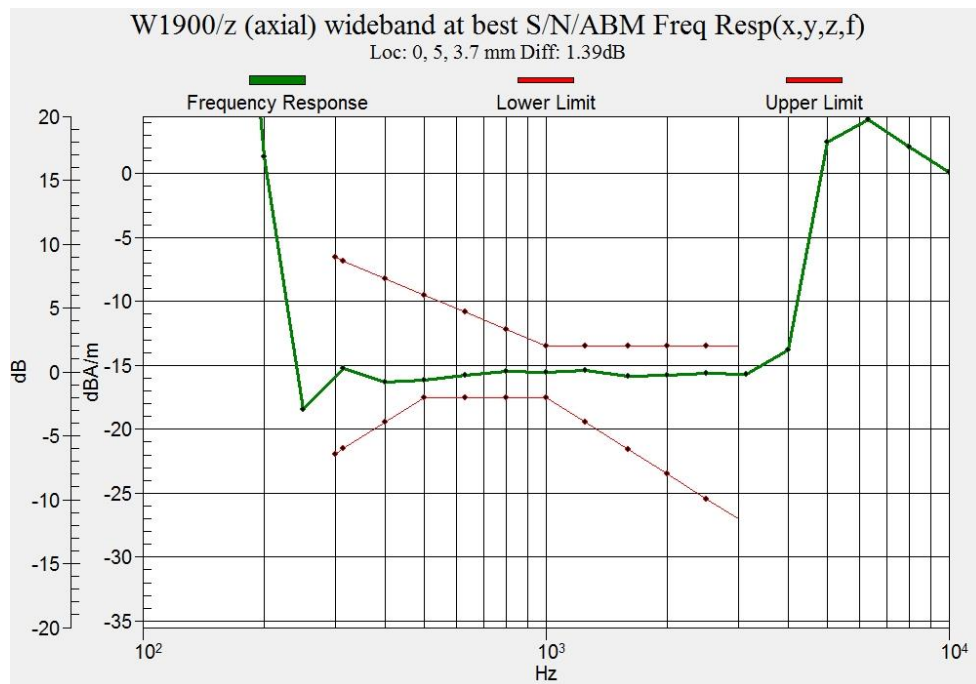


Figure B.21 Frequency Response of WCDMA Band 2 (Google Duo)

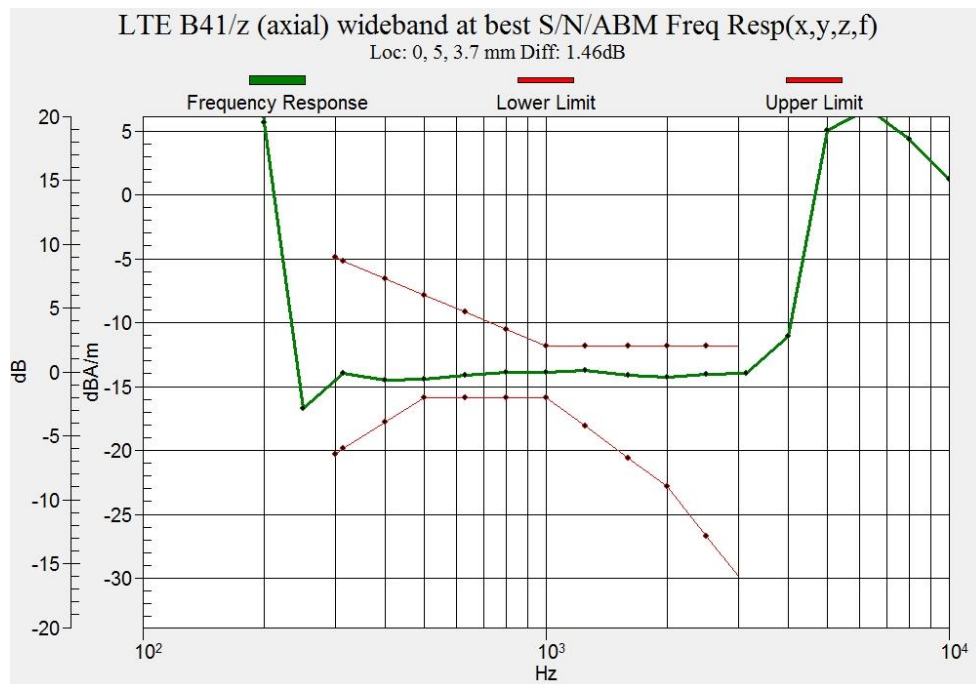


Figure B.22 Frequency Response of LTE Band 41 PC3 (Google Duo)

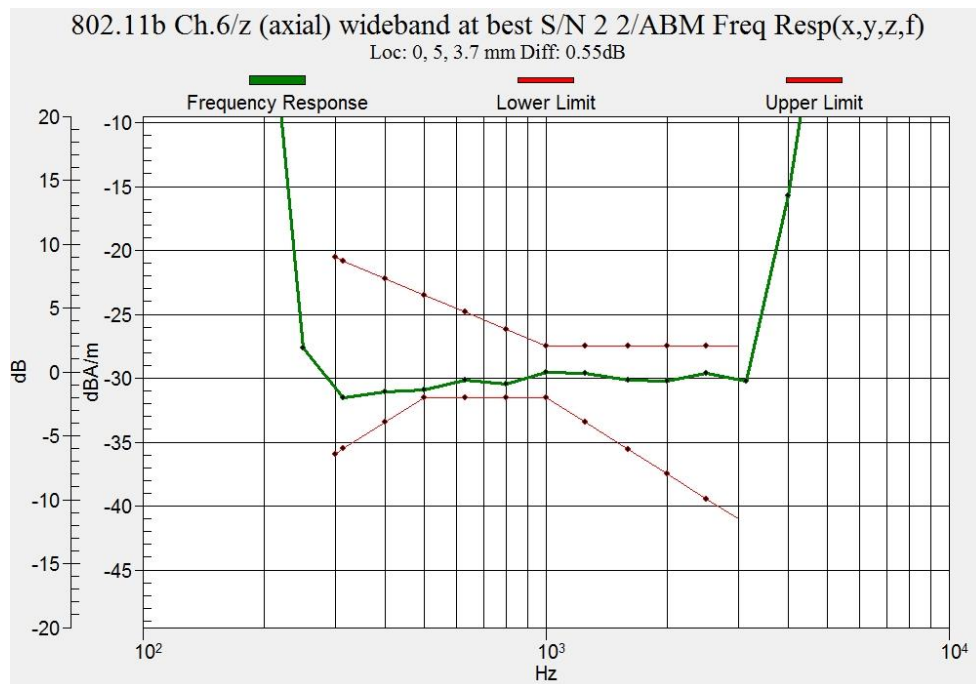


Figure B.23 Frequency Response of WLAN 2.4GHz (Google Duo)

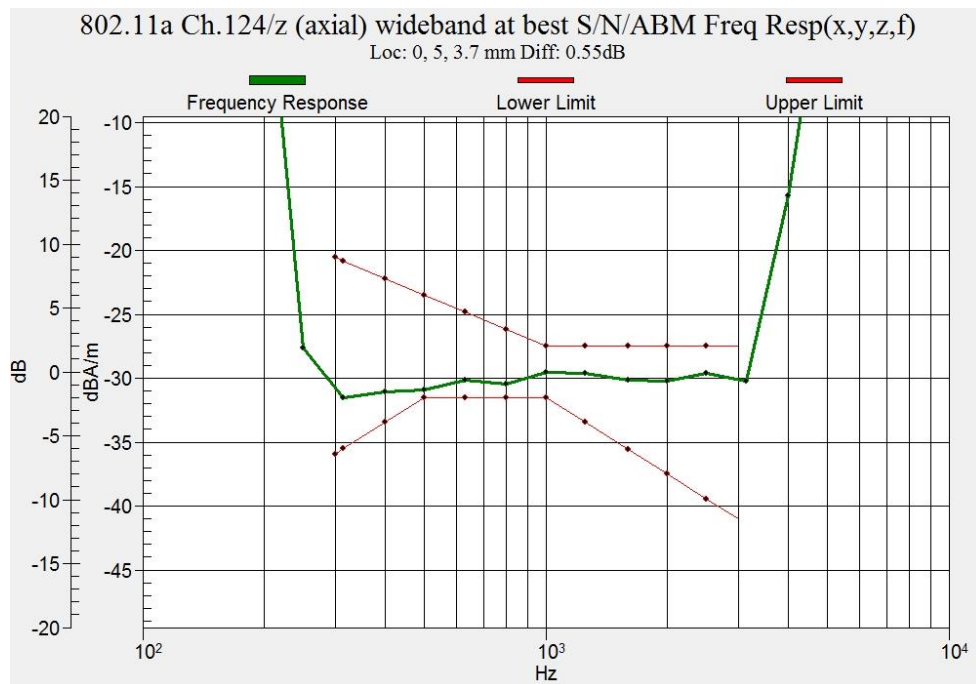


Figure B.24 Frequency Response of WLAN 5.5GHz (Google Duo)

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 **TMC-SZ (Auden)**

Certificate No: **AM1DV3-3086_Feb21**

CALIBRATION CERTIFICATE																																											
Object	AM1DV3 - SN: 3086																																										
Calibration procedure(s)	QA CAL-24.v4 Calibration procedure for AM1D magnetic field probes and TMFS in the audio range																																										
Calibration date:	February 22, 2021																																										
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Certificate No: AM1DV3-3086_Feb21

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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	3086

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)	204.9 °	+/- 3.6 ° (k=2)
Sensor angle	(in DASY system)	1.35 °	+/- 0.5 ° (k=2)
Sensitivity at 1 kHz	(in DASY system)	0.00743 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: DAE 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 **Saict-SZ (Auden)**

Certificate No: **DAE4-1527_Jun22**

CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BM - SN: 1527**

Calibration procedure(s) **QA CAL-06.v30
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **June 21, 2022**

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	31-Aug-21 (No:31366)	Aug-22
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	24-Jan-22 (in house check)	In house check: Jan-23
Calibrator Box V2.1	SE UMS 006 AA 1002	24-Jan-22 (in house check)	In house check: Jan-23

Calibrated by:	Name Adrian Gehring	Function Laboratory Technician	Signature 
Approved by:	Sven Kühn	Technical Manager	

Issued: June 21, 2022

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Certificate No: DAE4-1527_Jun22

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Accreditation No.: **SCS 0108**

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 following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - **DC Voltage Measurement Linearity:** Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - **Common mode sensitivity:** Influence of a positive or negative common mode voltage on the differential measurement.
 - **Channel separation:** Influence of a voltage on the neighbor channels not subject to an input voltage.
 - **AD Converter Values with inputs shorted:** Values on the internal AD converter corresponding to zero input voltage
 - **Input Offset Measurement:** Output voltage and statistical results over a large number of zero voltage measurements.
 - **Input Offset Current:** Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - **Input resistance:** Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - **Low Battery Alarm Voltage:** Typical value for information. Below this voltage, a battery alarm signal is generated.
 - **Power consumption:** Typical value for information. Supply currents in various operating modes.

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

Calibration Factors	X	Y	Z
High Range	403.865 ± 0.02% (k=2)	403.595 ± 0.02% (k=2)	403.805 ± 0.02% (k=2)
Low Range	3.95898 ± 1.50% (k=2)	3.98939 ± 1.50% (k=2)	3.96763 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	61.0 ° ± 1 °
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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200037.59	1.98	0.00
Channel X	+ Input	20007.61	1.34	0.01
Channel X	- Input	-20004.09	1.79	-0.01
Channel Y	+ Input	200037.45	1.53	0.00
Channel Y	+ Input	20002.68	-3.42	-0.02
Channel Y	- Input	-20007.17	-1.14	0.01
Channel Z	+ Input	200037.73	2.17	0.00
Channel Z	+ Input	20005.72	-0.34	-0.00
Channel Z	- Input	-20006.63	-0.49	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2001.36	-0.15	-0.01
Channel X	+ Input	201.70	0.16	0.08
Channel X	- Input	-198.10	0.49	-0.24
Channel Y	+ Input	2001.44	0.07	0.00
Channel Y	+ Input	201.07	-0.21	-0.11
Channel Y	- Input	-199.66	-0.98	0.50
Channel Z	+ Input	2001.52	0.21	0.01
Channel Z	+ Input	200.81	-0.41	-0.20
Channel Z	- Input	-199.00	-0.15	0.07

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-3.95	-5.31
	- 200	5.96	4.97
Channel Y	200	-16.18	-16.25
	- 200	14.41	14.34
Channel Z	200	3.01	2.86
	- 200	-3.93	-4.13

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	-0.68	-2.76
Channel Y	200	5.43	-	-0.31
Channel Z	200	10.73	3.29	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16059	17078
Channel Y	15965	16219
Channel Z	15888	13556

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	1.40	0.30	2.25	0.35
Channel Y	-0.62	-1.30	0.47	0.33
Channel Z	-0.18	-0.90	0.60	0.31

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9