

**T-Coil LTE-Band 25 Transverse**

Date: 2019-9-29

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 1882.5 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: 0.15 dB

Device Reference Point: 0, 0, -6.3 mm

**Cursor:**

ABM1 = -4.23 dBA/m

BWC Factor = 0.15 dB

Location: 5, 10.5, 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: 37.15

Measure Window Start: 300ms

Measure Window Length: 1000ms

BWC applied: 0.15 dB

Device Reference Point: 0, 0, -6.3 mm

**Cursor:**

ABM1/ABM2 = 31.89 dB

ABM1 comp = -10.27 dBA/m

BWC Factor = 0.15 dB

Location: -4.5, 8, 3.7 mm

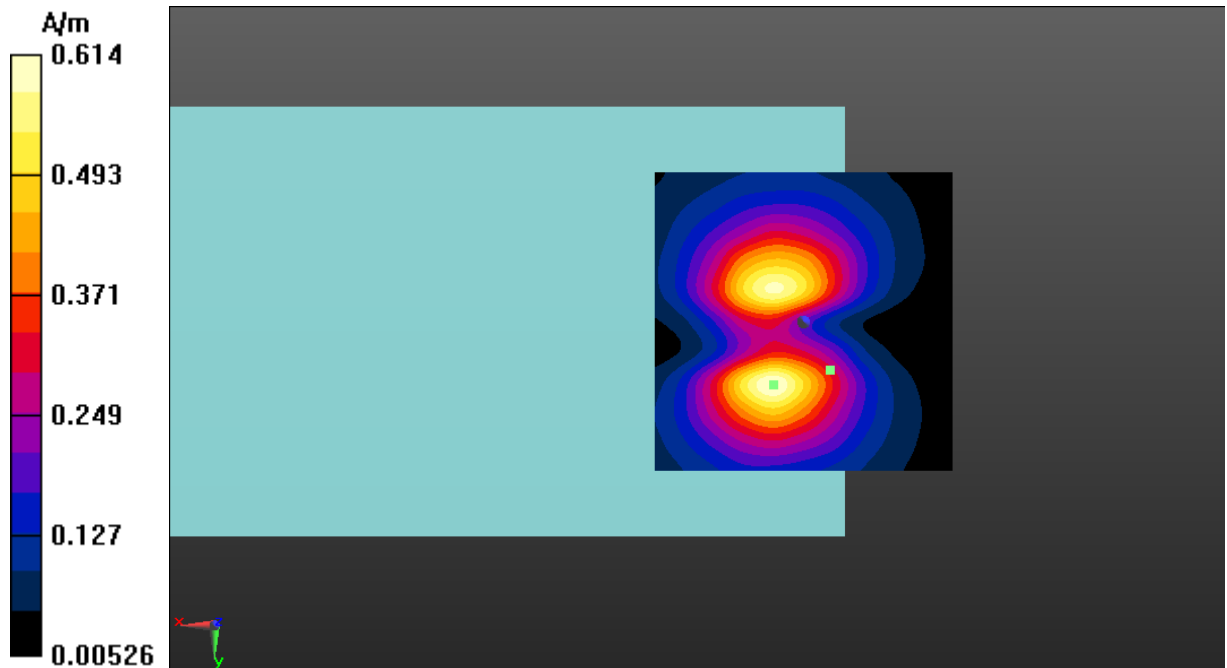


Fig A.33 T-Coil LTE-Band 25-Y

**T-Coil LTE-Band 26 Axial**

Date: 2019-9-29

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 831.5 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 = 2.92 dBA/m

BWC Factor = 0.16 dB

Location: 5, 3, 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 = 42.42 dB

ABM1 comp = -3.92 dBA/m

BWC Factor = 0.16 dB

Location: -4.5, 1.5, 3.7 mm

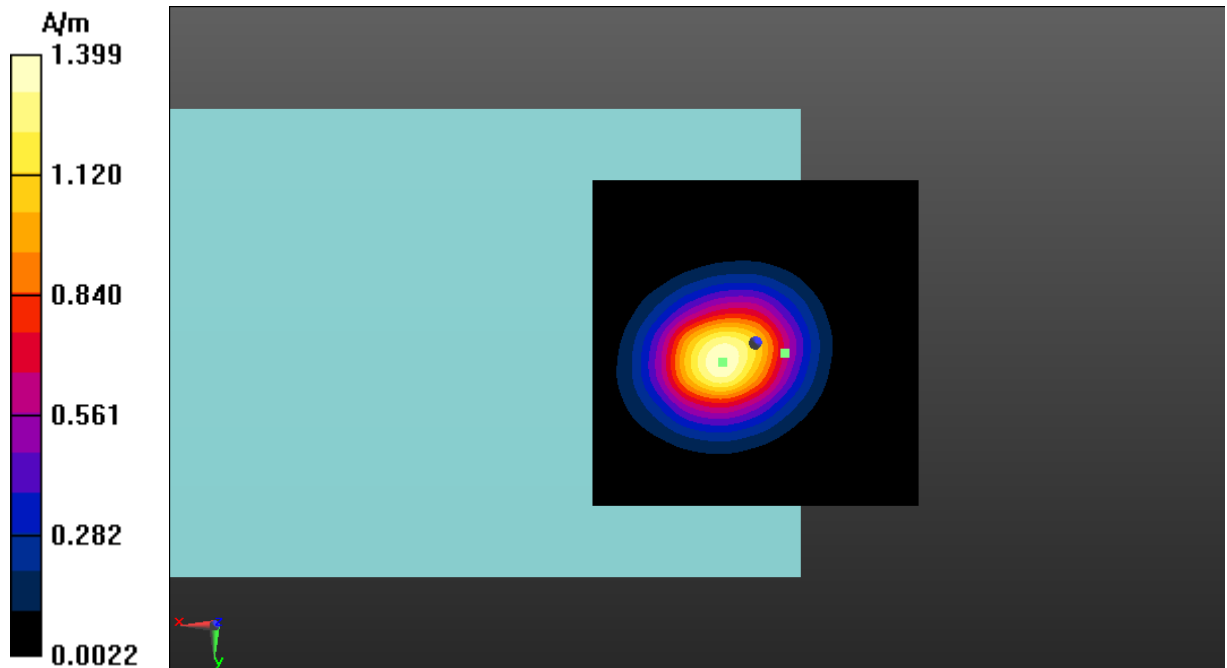


Fig A.34 T-Coil LTE-Band 26-Z

**T-Coil LTE-Band 26 Transverse**

Date: 2019-9-29

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 831.5 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 = -4.15 dBA/m

BWC Factor = 0.16 dB

Location: 5, 10.5, 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: 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 = 32.98 dB

ABM1 comp = -10.72 dBA/m

BWC Factor = 0.16 dB

Location: -6.5, -6.5, 3.7 mm

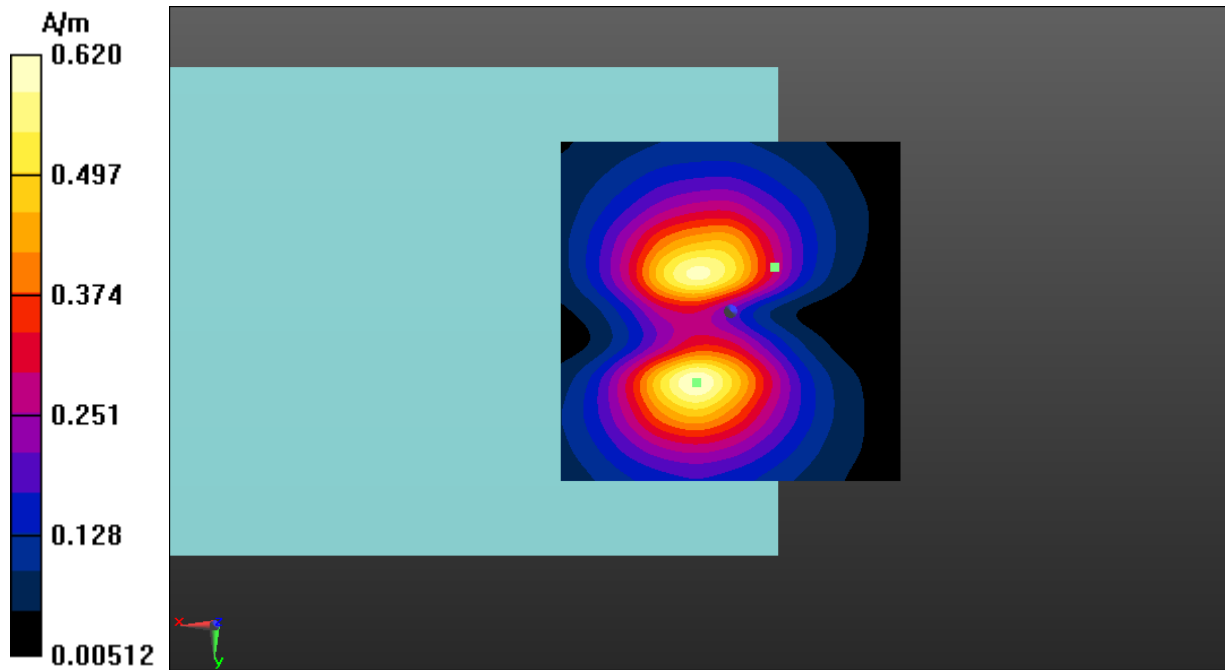


Fig A.34 T-Coil LTE-Band 26-Y

**T-Coil LTE-Band 66 Axial**

Date: 2019-9-29

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 1745 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 = 2.85 dBA/m

BWC Factor = 0.16 dB

Location: 5, 1.5, 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 = 42.21 dB

ABM1 comp = -3.40 dBA/m

BWC Factor = 0.16 dB

Location: -4, 1.5, 3.7 mm

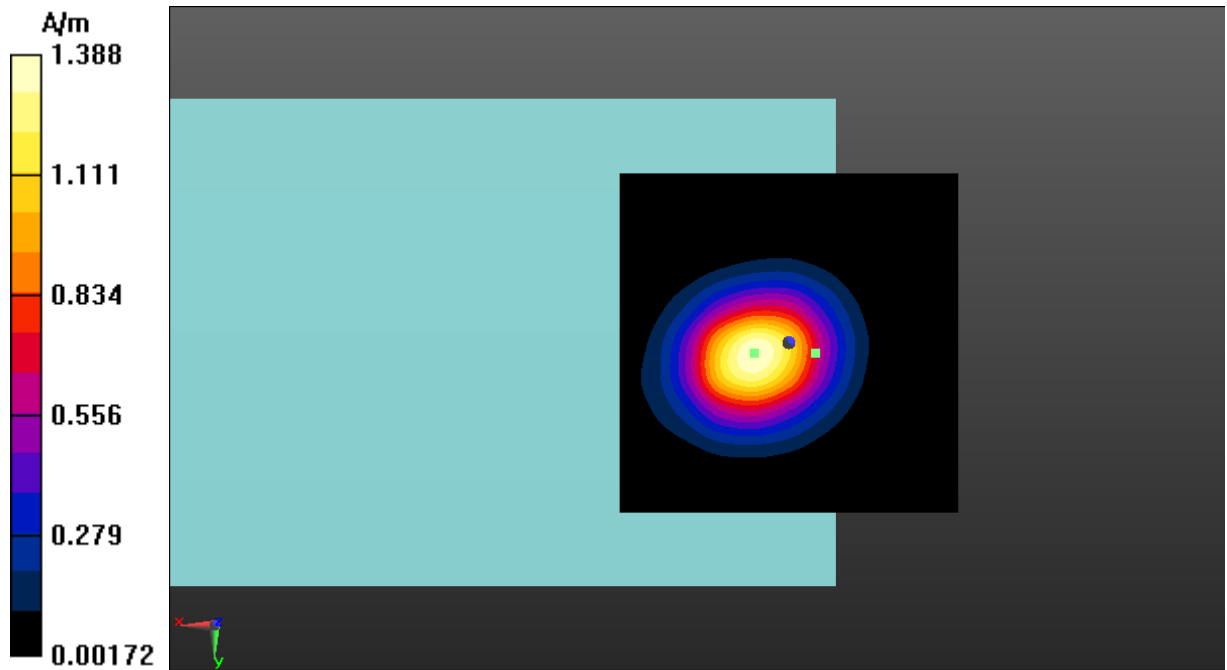


Fig A.35 T-Coil LTE-Band 66-Z



**T-Coil LTE-Band 66 Transverse**

Date: 2019-9-29

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 1745 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 = -4.39 dBA/m

BWC Factor = 0.16 dB

Location: 5, 10.5, 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: 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 = 32.54 dB

ABM1 comp = -10.57 dBA/m

BWC Factor = 0.16 dB

Location: -6.5, -7, 3.7 mm

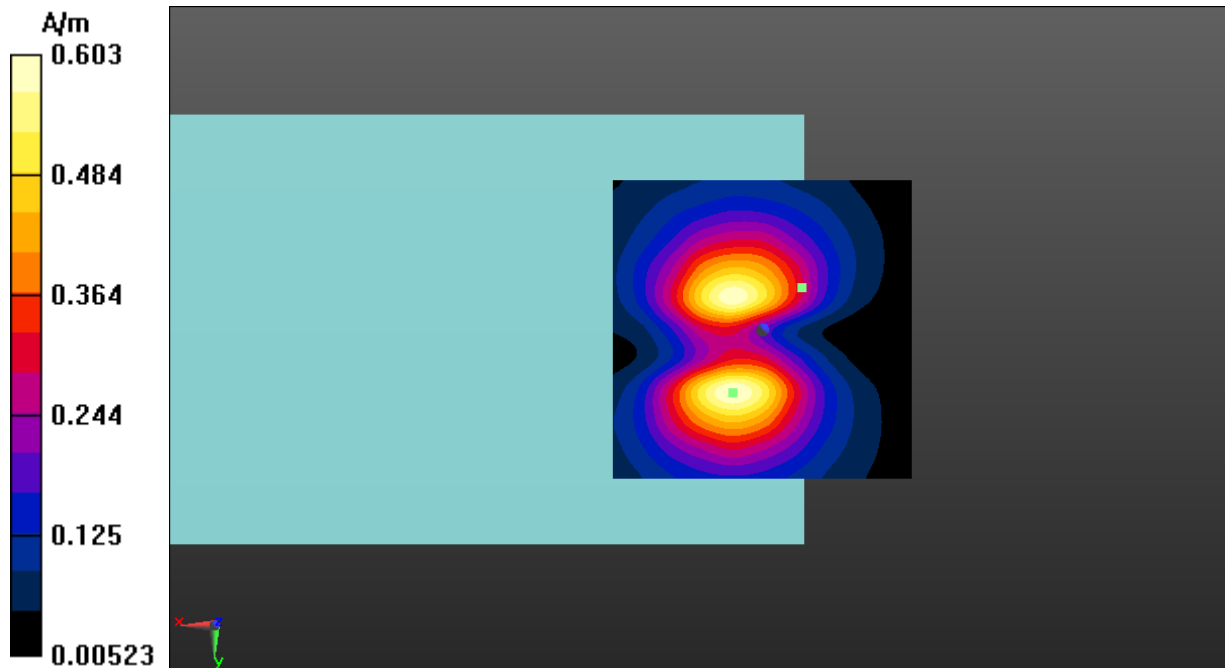


Fig A.35 T-Coil LTE-Band 66-Y

**T-Coil LTE-Band 71 Axial**

Date: 2019-9-30

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 683 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 = 2.91 dBA/m

BWC Factor = 0.16 dB

Location: 5, 3.5, 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 = 43.24 dB

ABM1 comp = -3.92 dBA/m

BWC Factor = 0.16 dB

Location: -4.5, 2, 3.7 mm

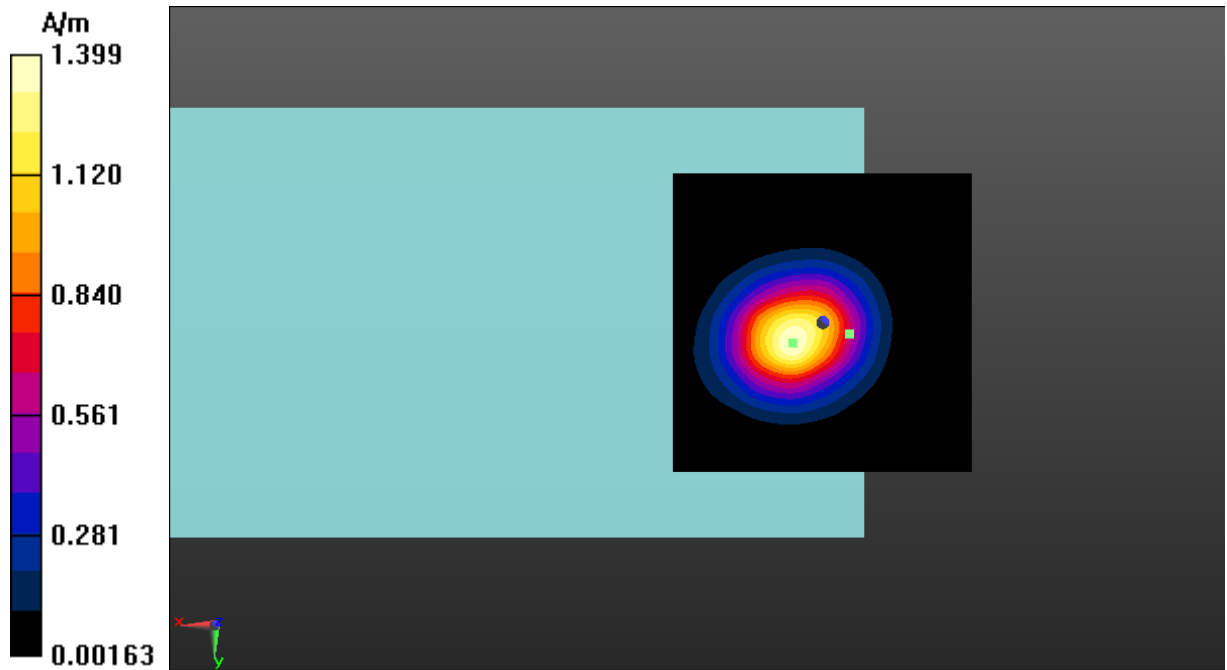


Fig A.36 T-Coil LTE-Band 71-Z

**T-Coil LTE-Band 71 Transverse**

Date: 2019-9-30

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_FDD (0) Frequency: 683 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 = -4.43 dBA/m

BWC Factor = 0.16 dB

Location: 5, -5.5, 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: 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 = 32.44 dB

ABM1 comp = -11.12 dBA/m

BWC Factor = 0.16 dB

Location: -4, 6.5, 3.7 mm

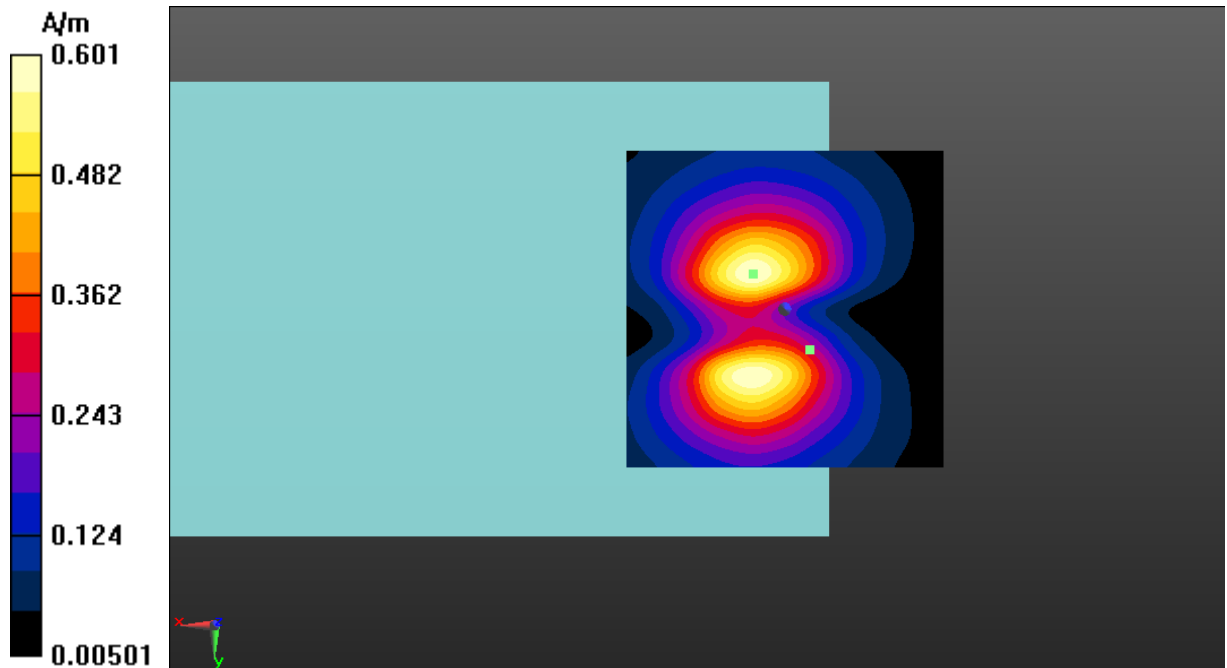


Fig A.36 T-Coil LTE-Band 71-Y

**T-Coil LTE-Band 41 Axial**

Date: 2019-9-30

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.5787

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 = 2.87 dBA/m

BWC Factor = 0.16 dB

Location: 5, 2.5, 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 = 39.58 dB

ABM1 comp = -2.76 dBA/m

BWC Factor = 0.16 dB

Location: -4, 0.5, 3.7 mm

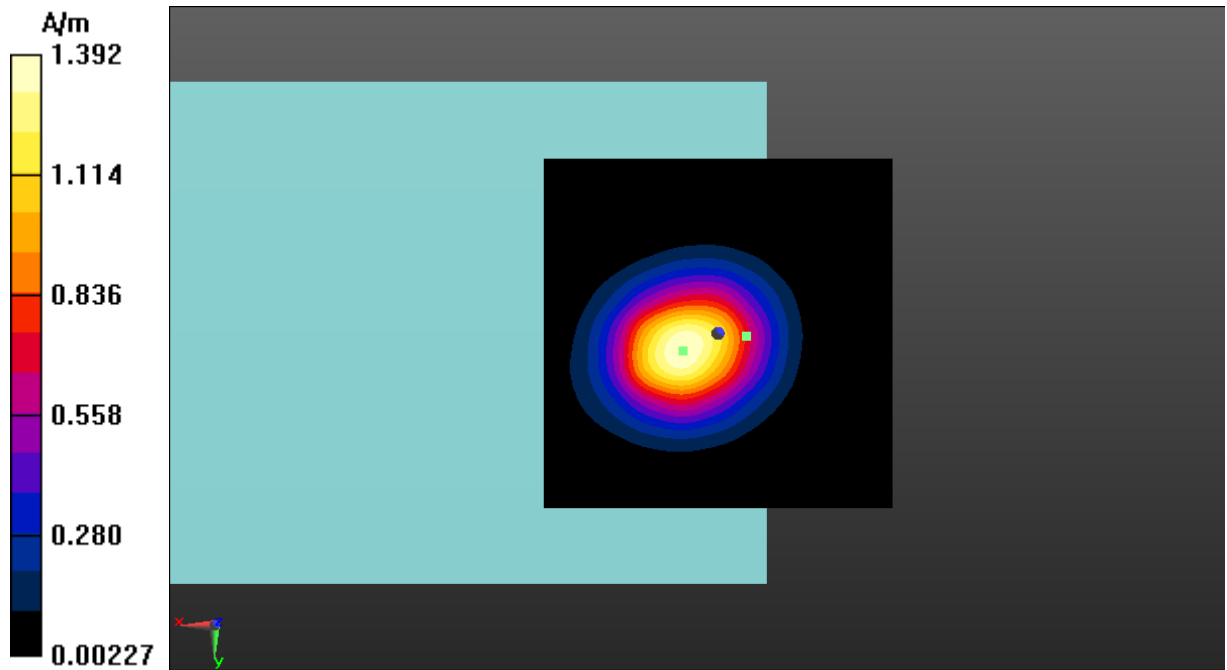


Fig A.37 T-Coil LTE-Band 41-Z



**T-Coil LTE-Band 41 Transverse**

Date: 2019-9-30

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: UID 0, LTE\_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.5787

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 = -4.20 dBA/m

BWC Factor = 0.16 dB

Location: 4.5, 10.5, 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: 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 = 30.50 dB

ABM1 comp = -9.03 dBA/m

BWC Factor = 0.16 dB

Location: -4, 8.5, 3.7 mm

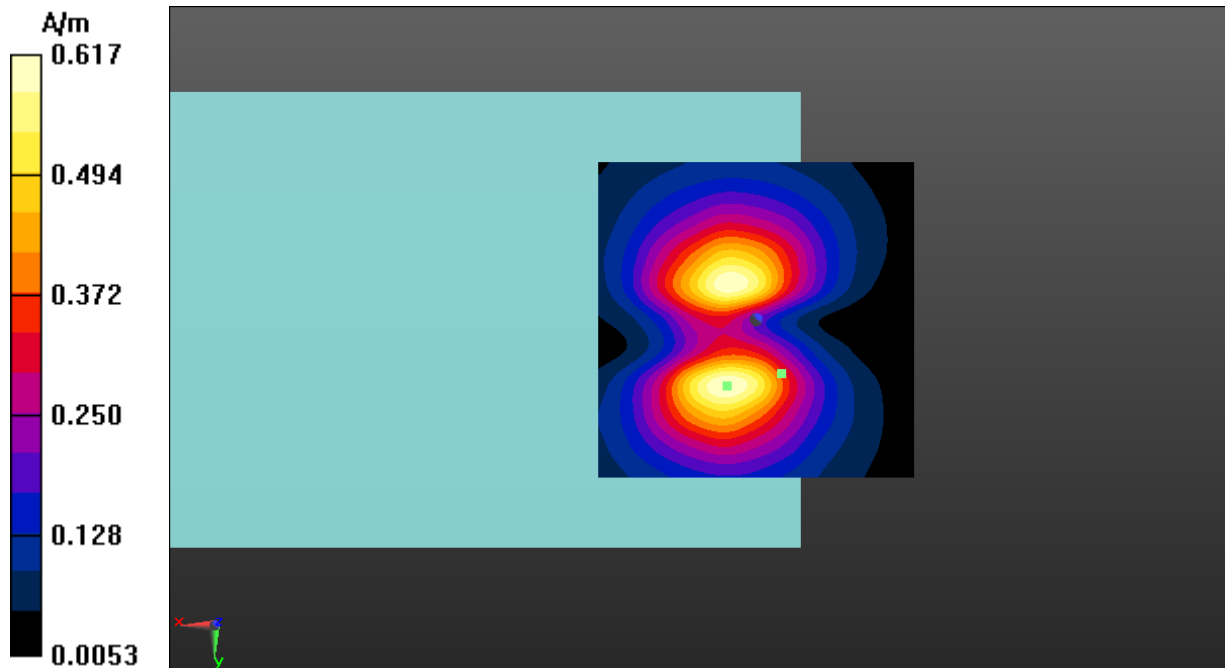


Fig A.37 T-Coil LTE-Band 41-Y

**T-Coil WIFI 2.4G Axial**

Date: 2020-3-3

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: WIFI 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 = 6.61 dBA/m

BWC Factor = 0.16 dB

Location: 5, 4, 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 = 44.62 dB

ABM1 comp = -1.83 dBA/m

BWC Factor = 0.16 dB

Location: -5, 5.5, 3.7 mm

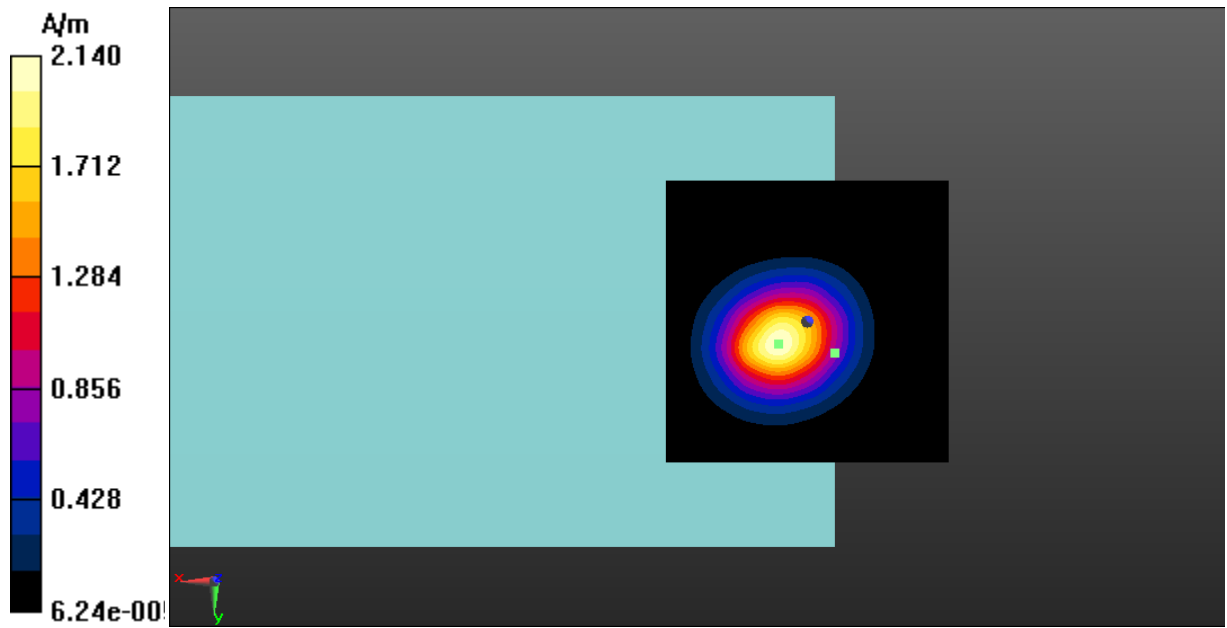


Fig A.38 T-Coil WIFI 2.4G-Z

**T-Coil WIFI 2.4G Transverse**

Date: 2020-3-3

Electronics: DAE4 Sn1527

Medium: Air

Medium parameters used:  $\sigma = 0$  S/m,  $\epsilon_r = 1$ ;  $\rho = 1$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C

Communication System: WIFI 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 = -0.34 dBA/m

BWC Factor = 0.16 dB

Location: 5, 10.5, 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 = 42.39 dB

ABM1 comp = -6.85 dBA/m

BWC Factor = 0.16 dB

Location: -6.5, -9.5, 3.7 mm

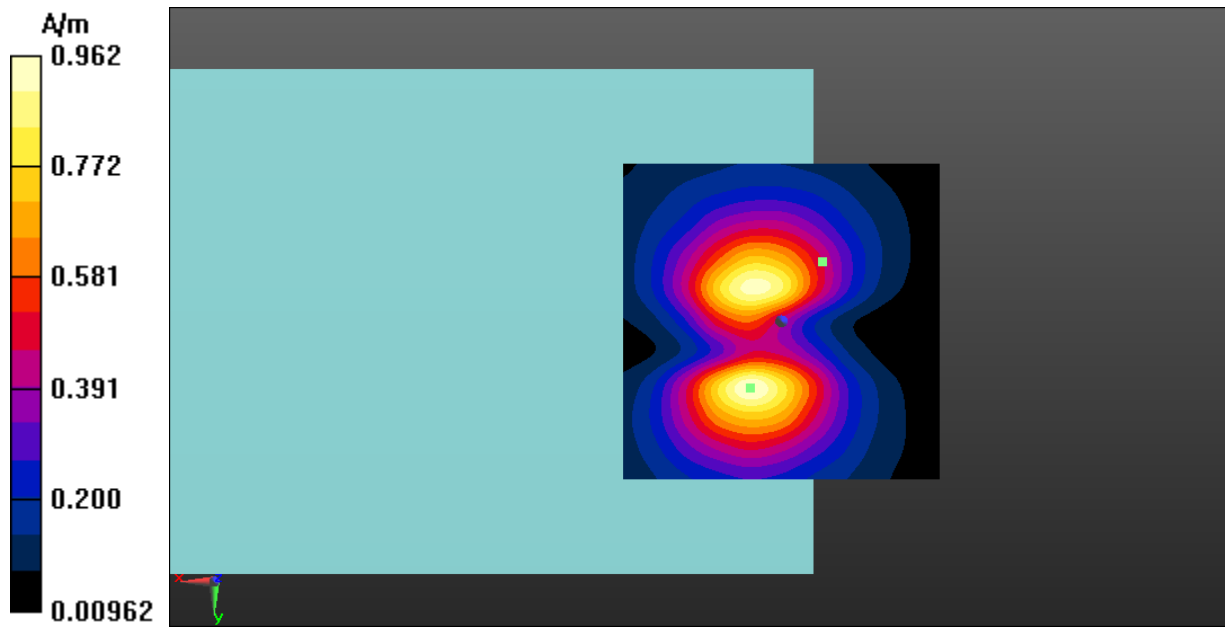


Fig A.38 T-Coil WIFI 2.4G-Y

## ANNEX B: Frequency Response Curves

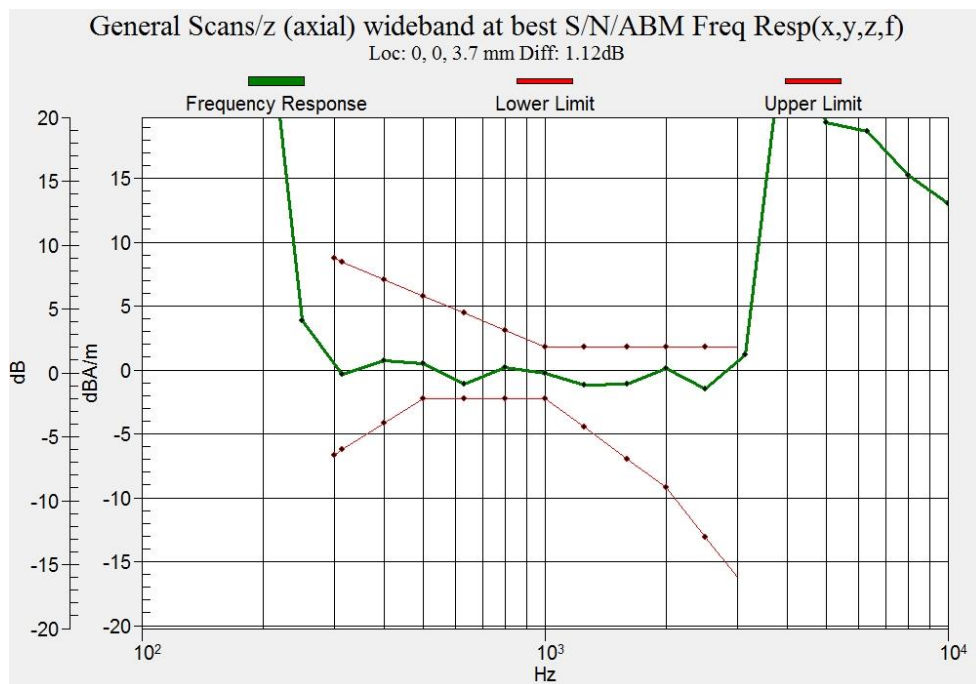


Figure B.1 Frequency Response of GSM 850

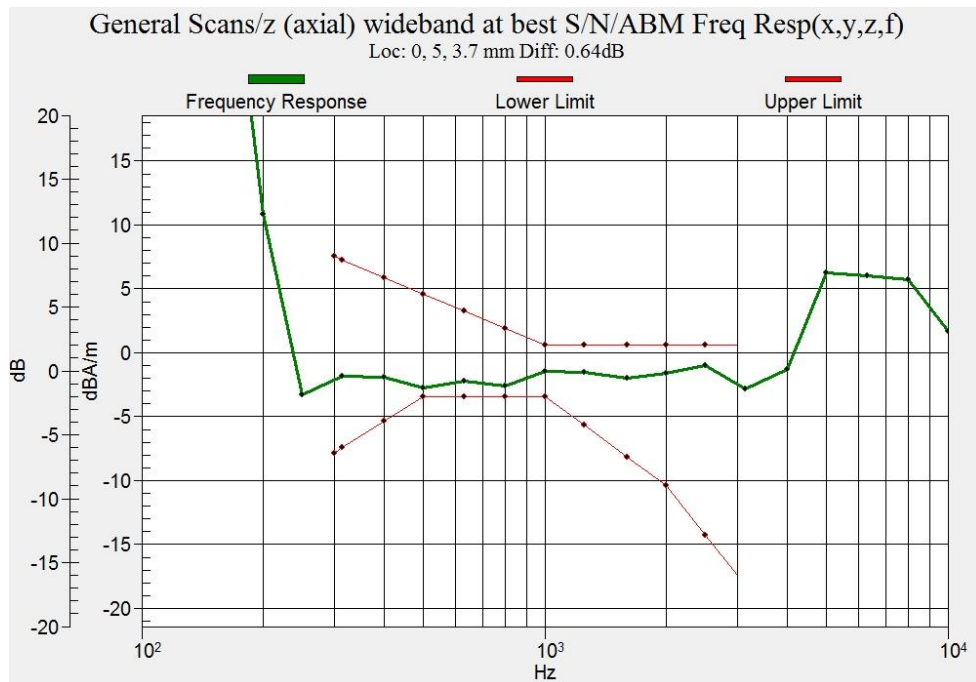


Figure B.2 Frequency Response of GSM 1900

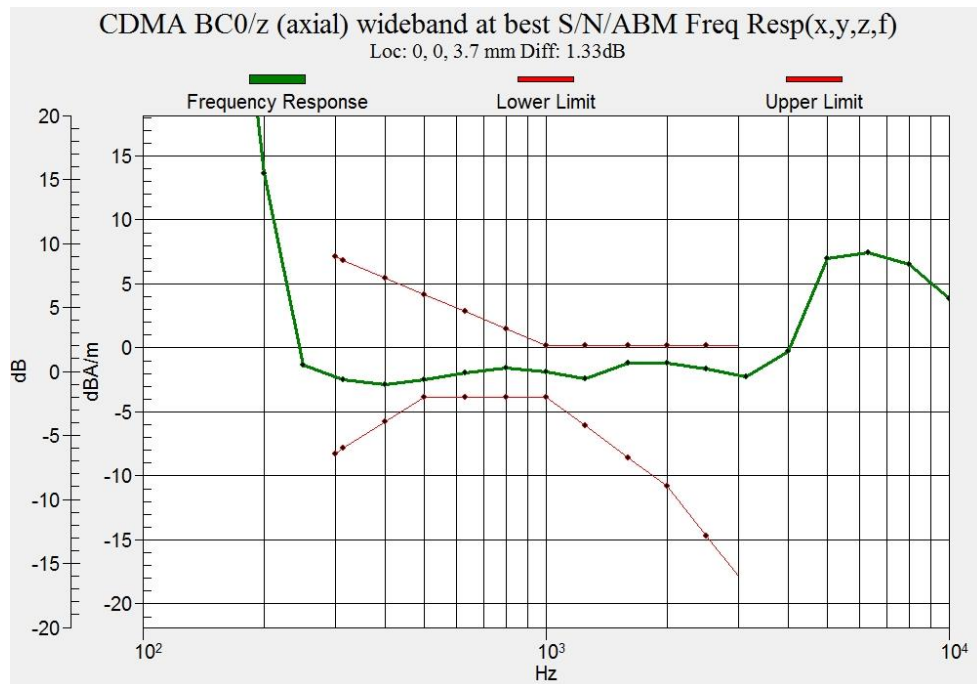


Figure B.3 Frequency Response of CDMA BC0

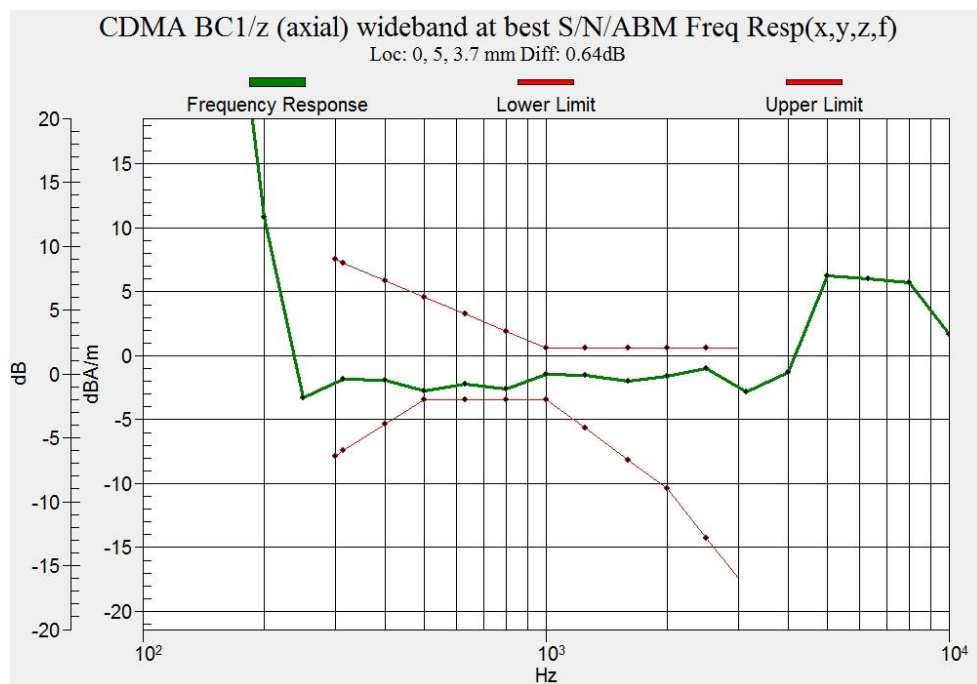


Figure B.4 Frequency Response of CDMA BC1



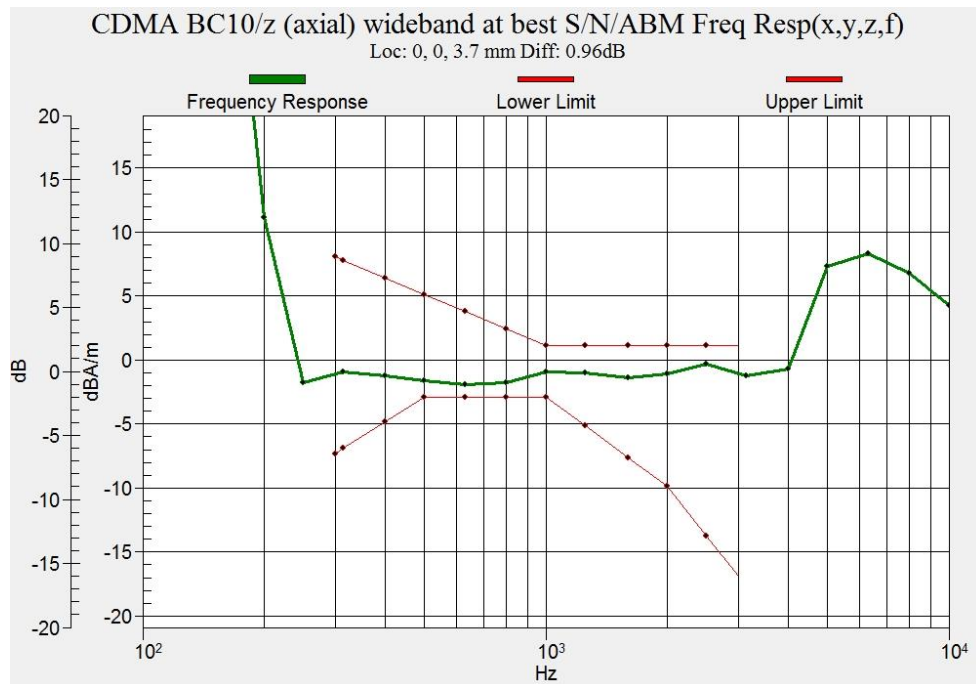


Figure B.5 Frequency Response of CDMA BC10

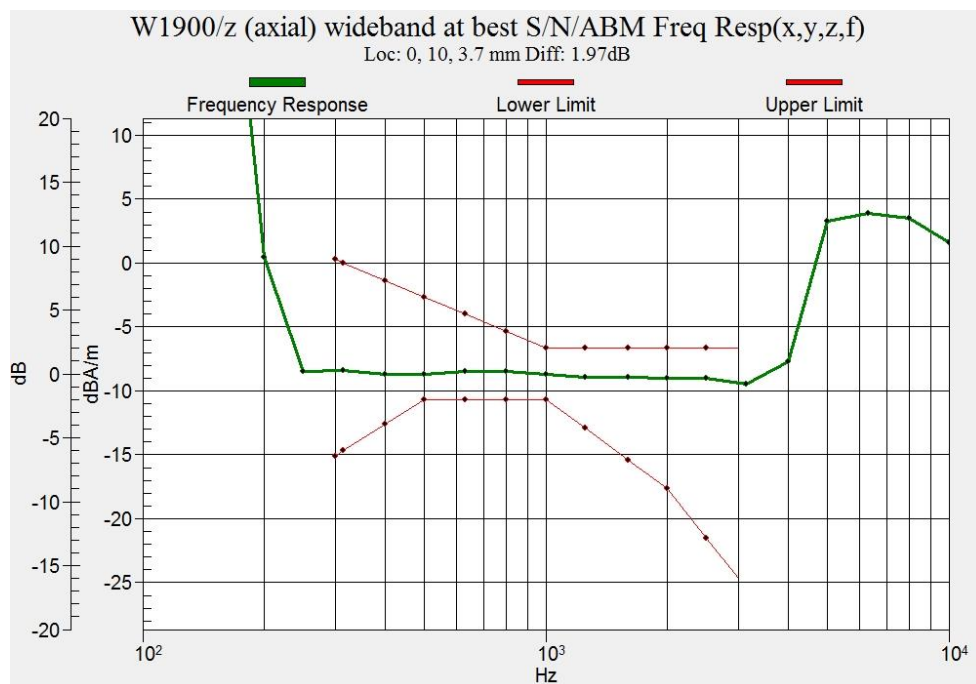


Figure B.6 Frequency Response of WCDMA B2

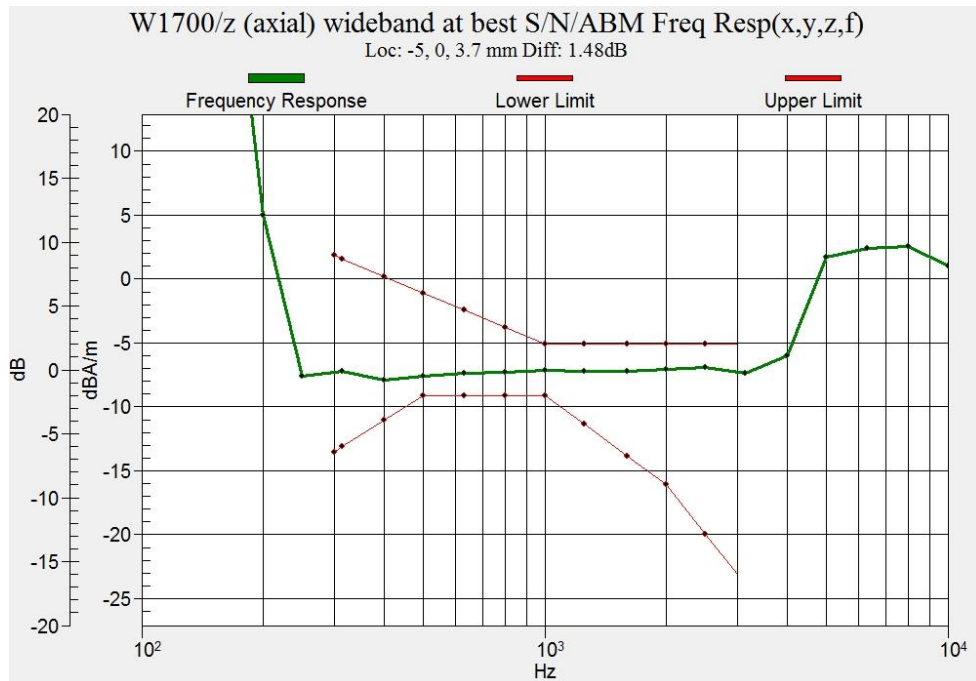


Figure B.7 Frequency Response of WCDMA B4



Figure B.8 Frequency Response of L WCDMA B5

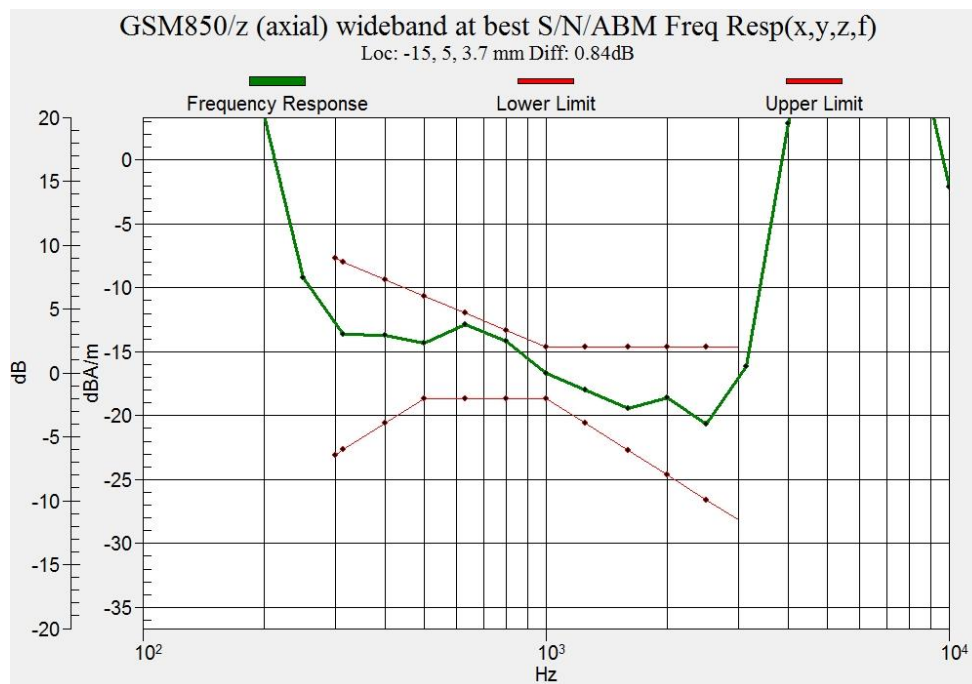


Figure B.9 Frequency Response of GSM850 (Google Duo)

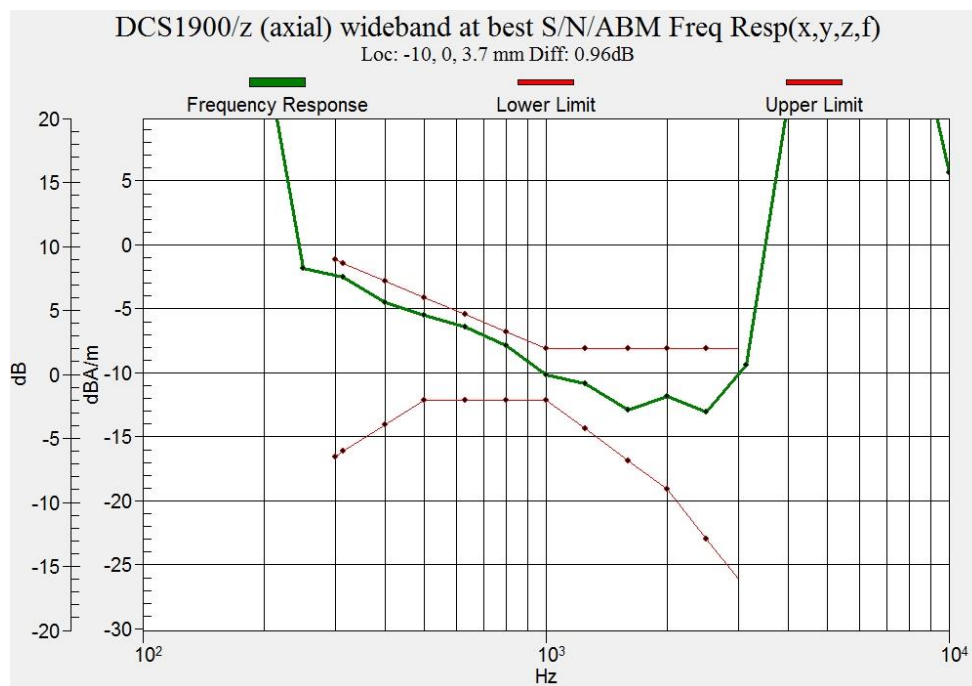


Figure B.10 Frequency Response of GSM1900 (Google Duo)

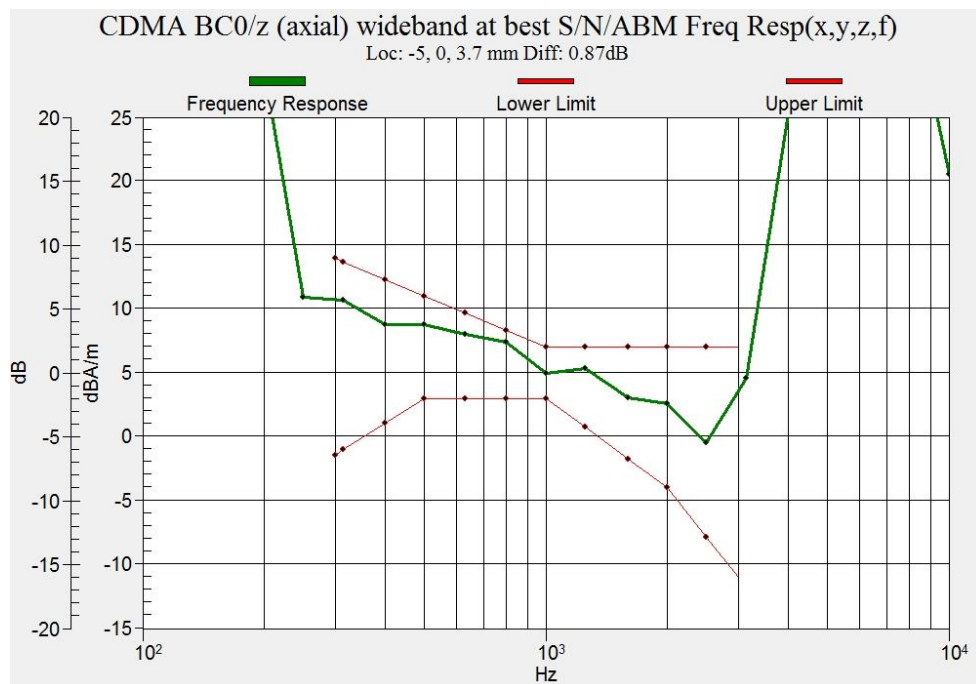


Figure B.11 Frequency Response of CDMA BC0 (Google Duo)

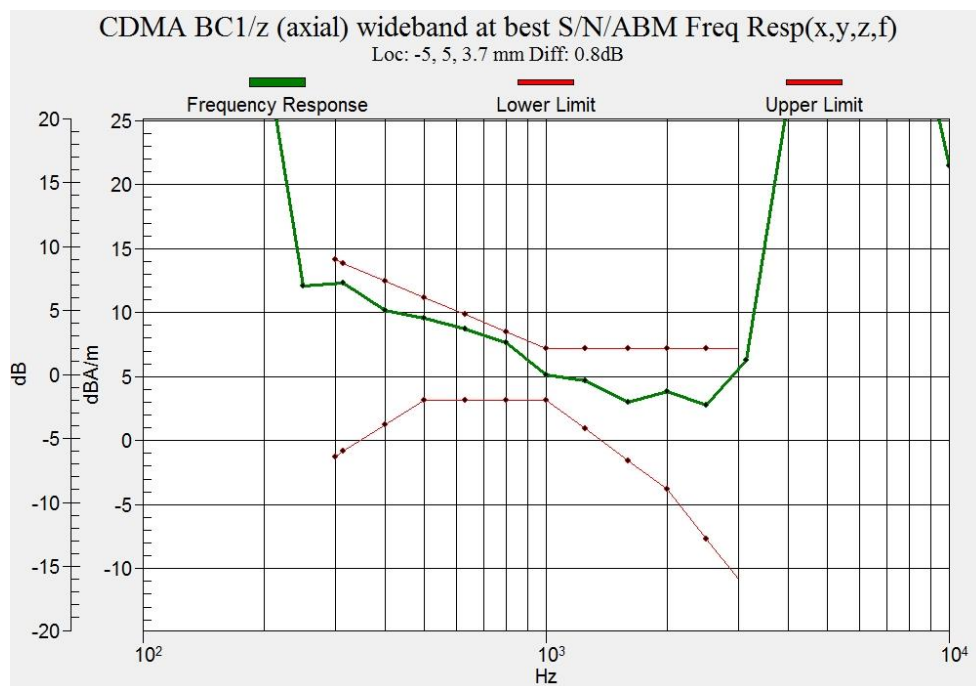


Figure B.12 Frequency Response of CDMA BC1 (Google Duo)

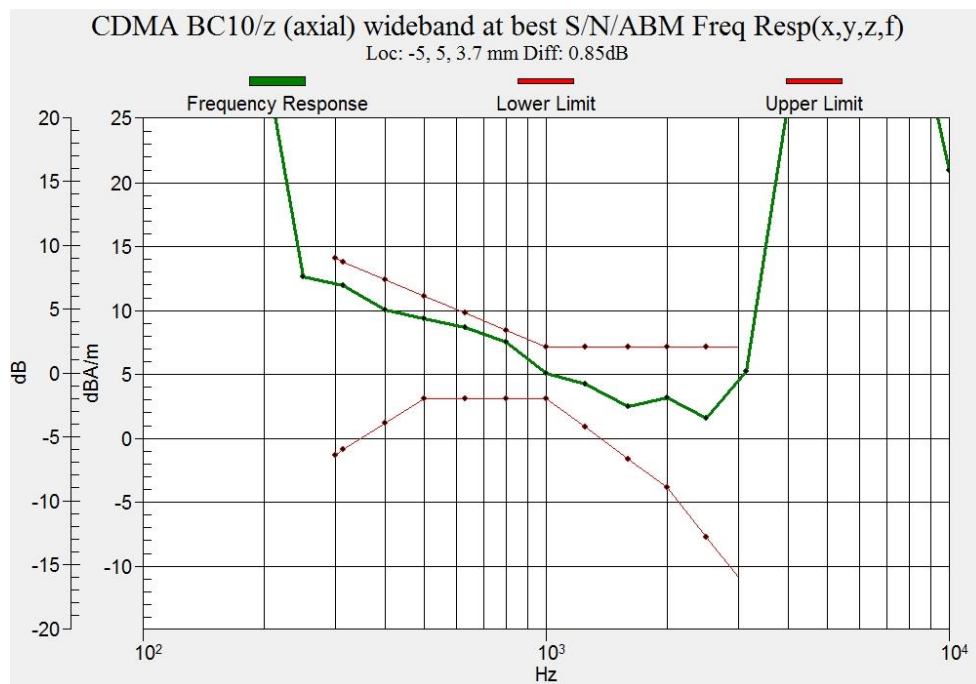


Figure B.13 Frequency Response of CDMA BC10 (Google Duo)

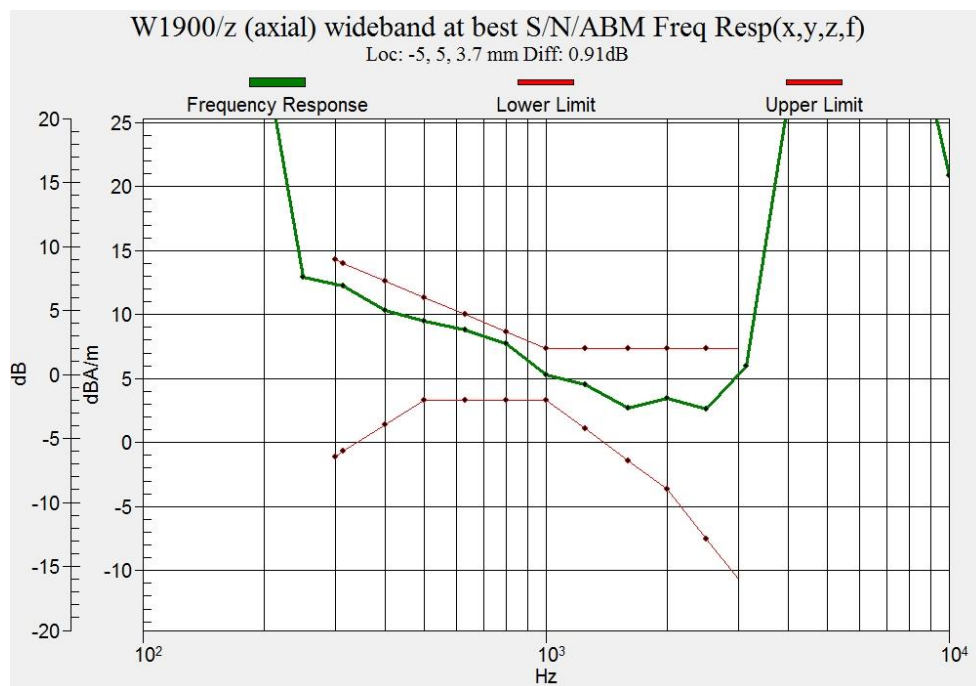


Figure B.14 Frequency Response of WCDMA B2 (Google Duo)

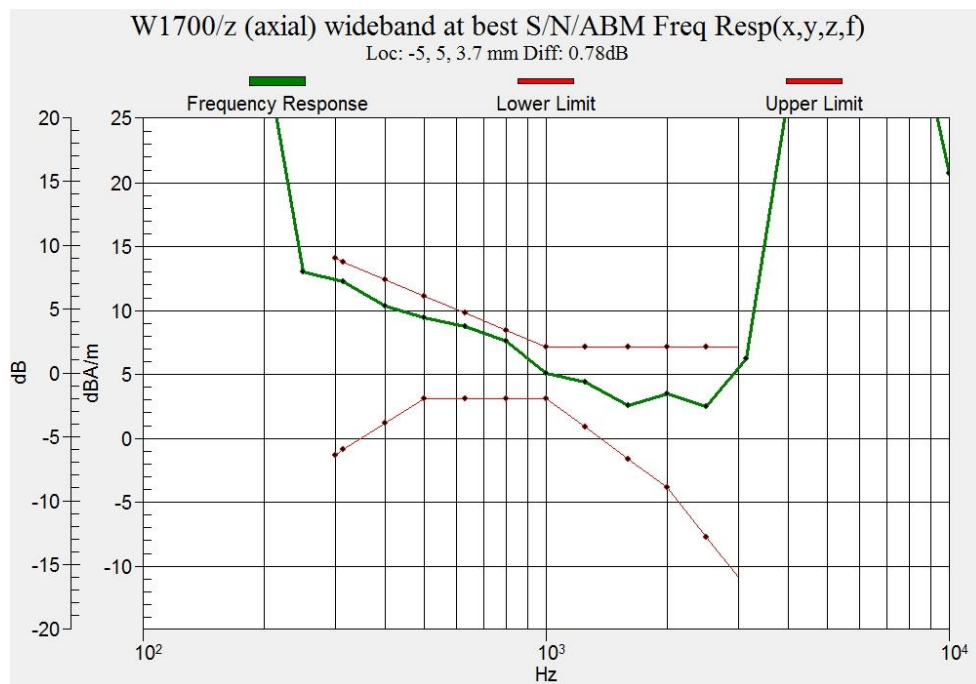


Figure B.15 Frequency Response of WCDMA B4 (Google Duo)



Figure B.16 Frequency Response of WCDMA B5 (Google Duo)



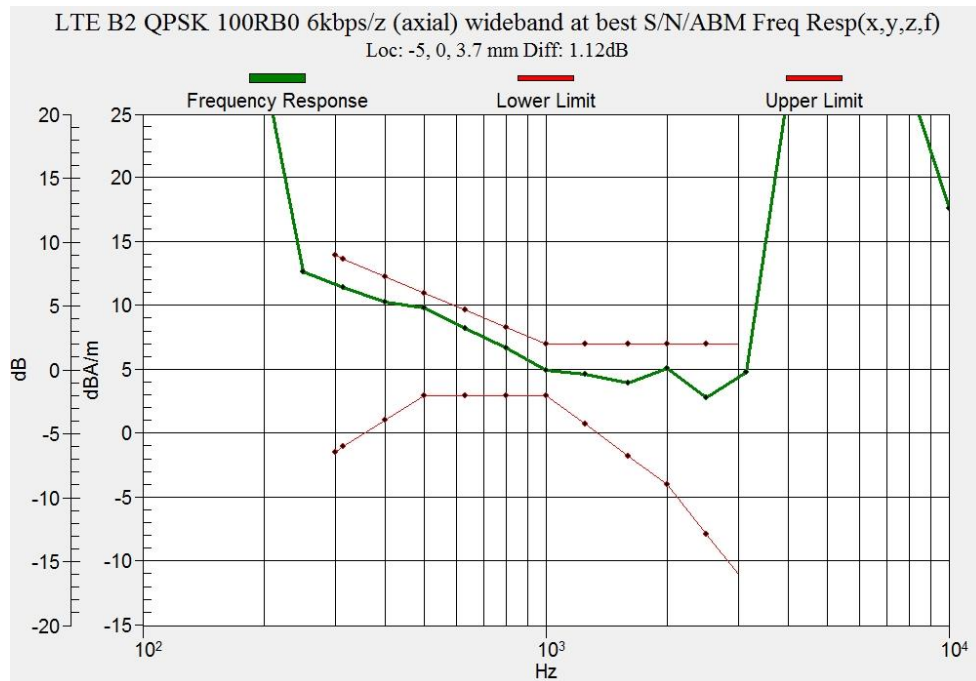


Figure B.17 Frequency Response of LTE B2 (Google Duo)

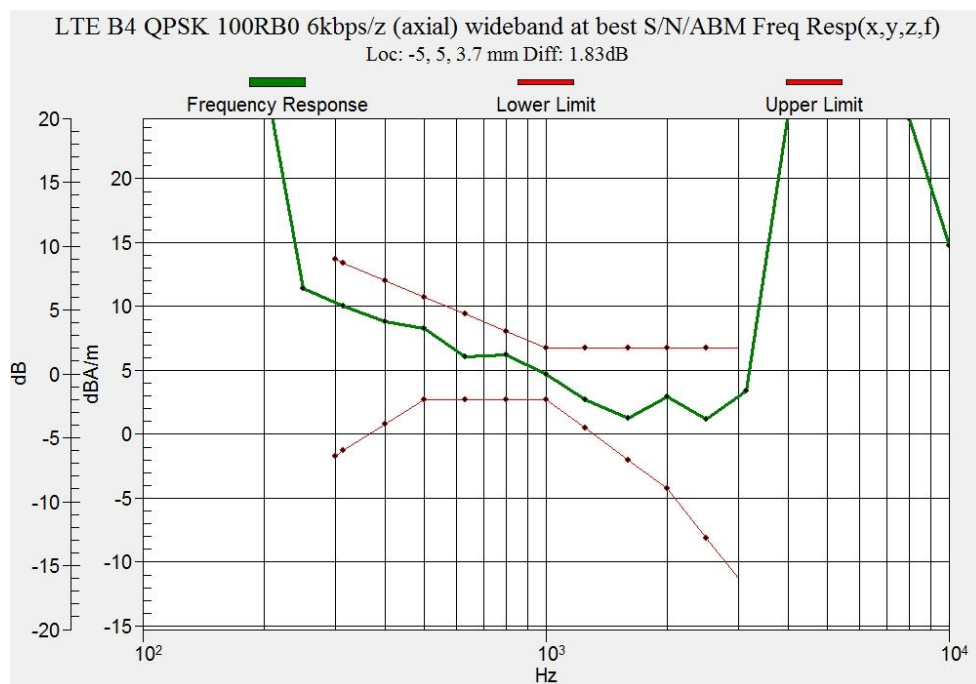


Figure B.18 Frequency Response of LTE B4 (Google Duo)

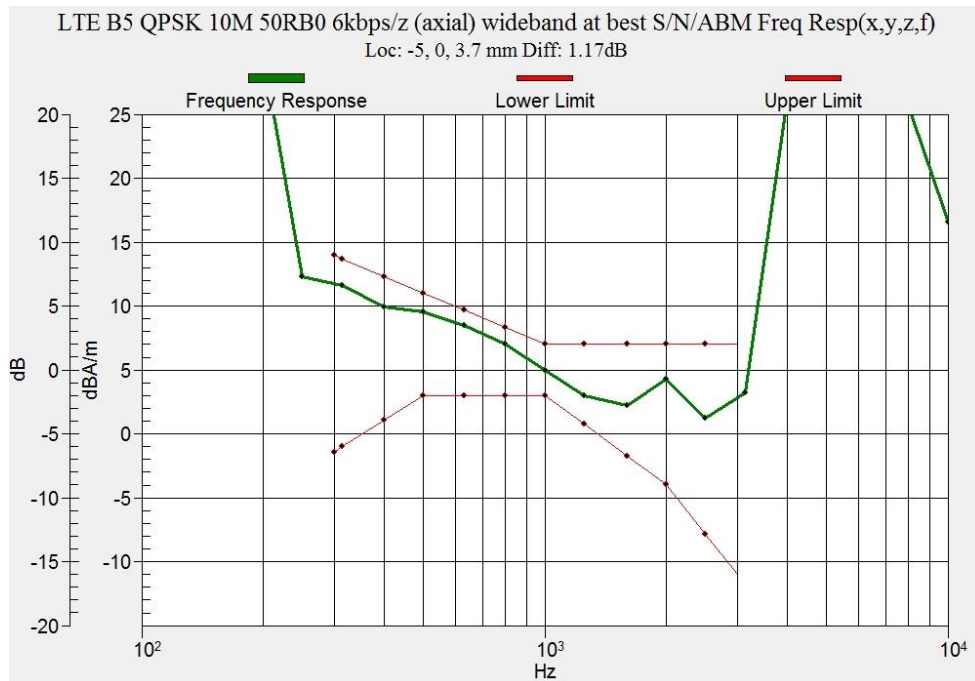


Figure B.19 Frequency Response of LTE B5 (Google Duo)

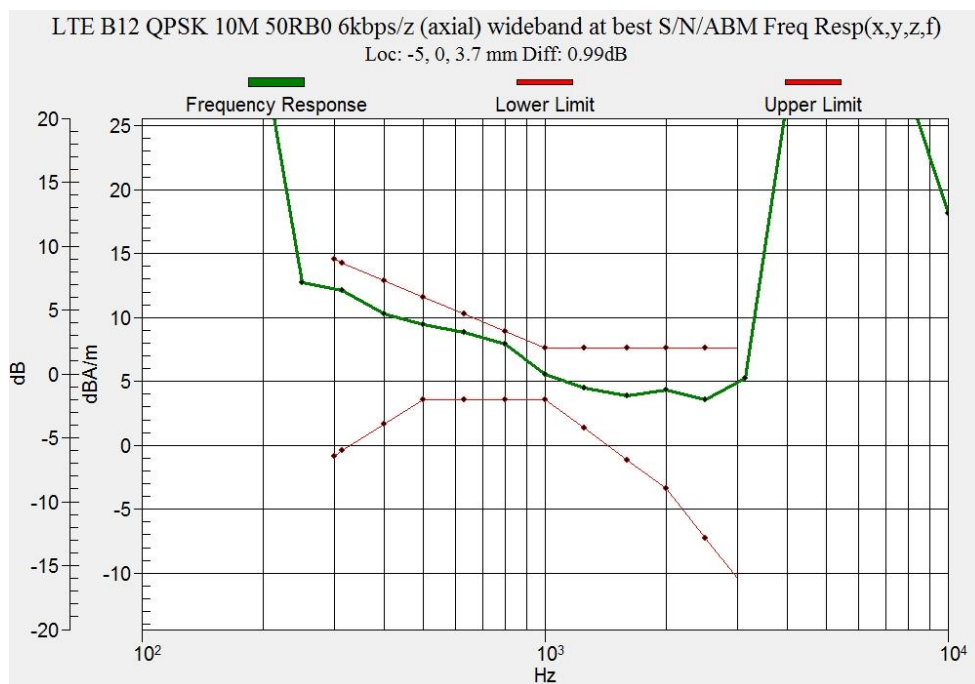


Figure B.20 Frequency Response of LTE B12 (Google Duo)



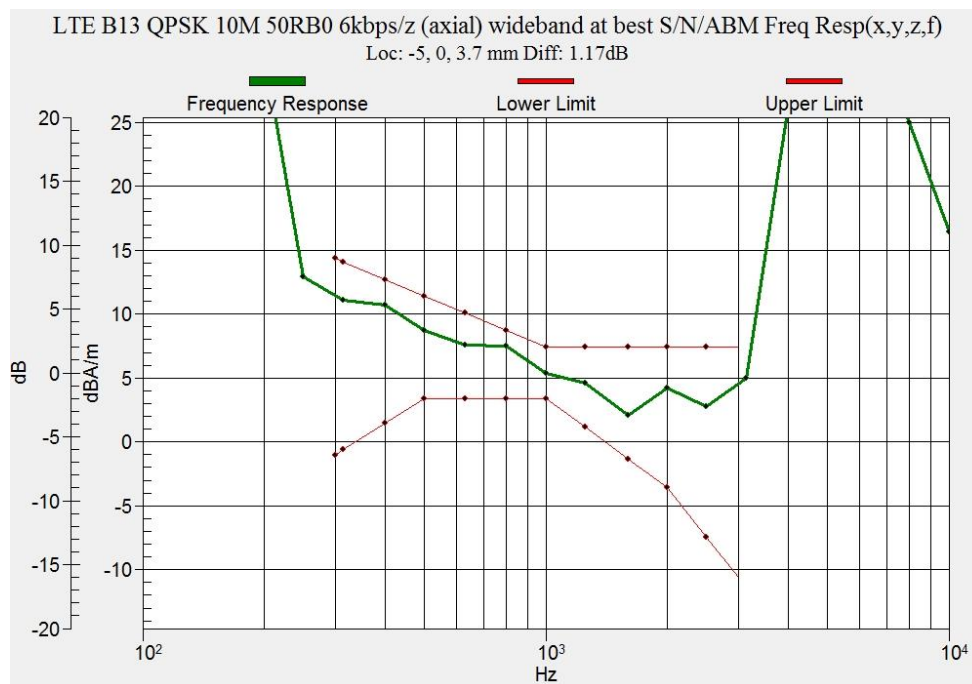


Figure B.21 Frequency Response of W LTE B13 (Google Duo)

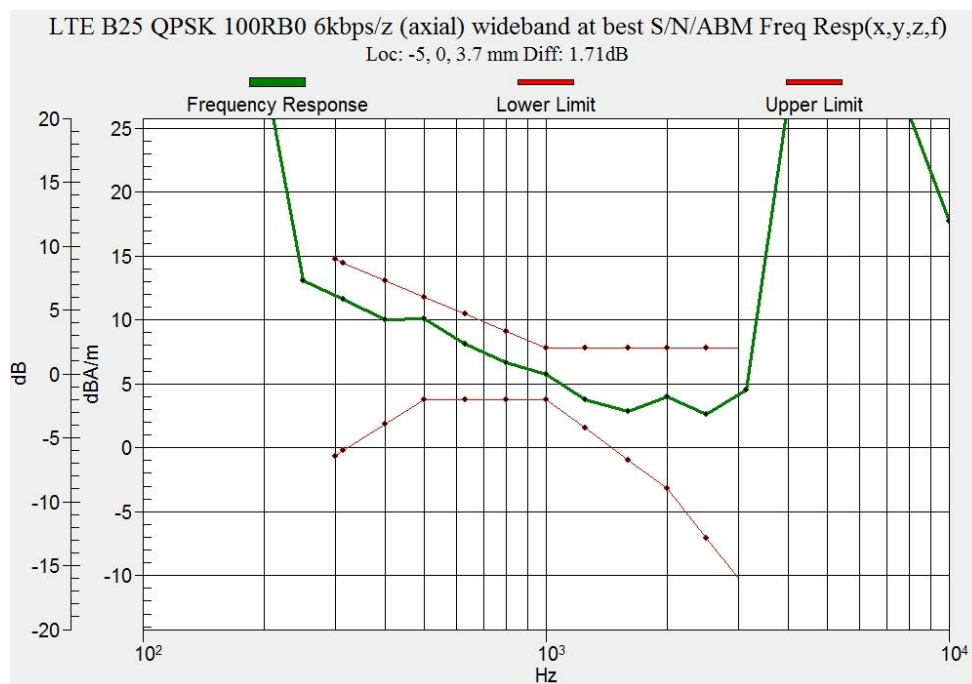


Figure B.22 Frequency Response of LTE B25 (Google Duo)

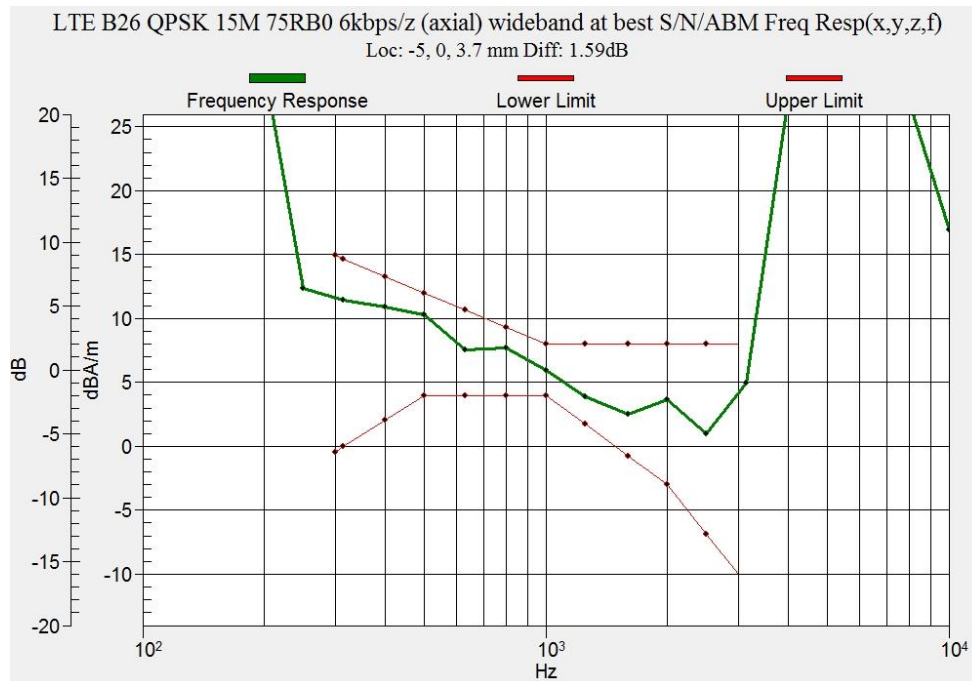


Figure B.23 Frequency Response of LTE B26 (Google Duo)

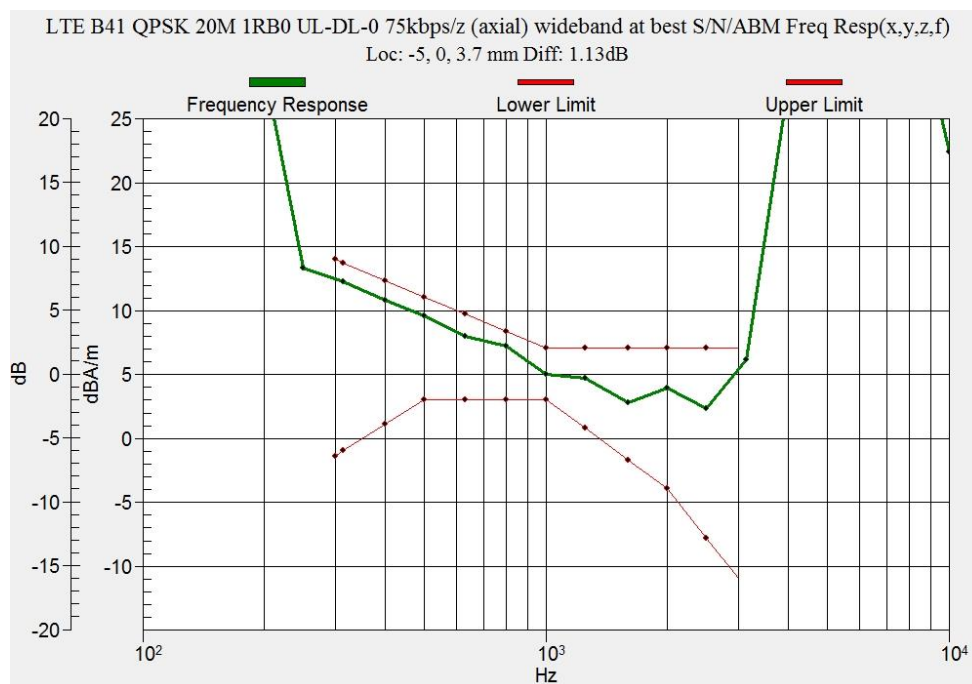


Figure B.24 Frequency Response of LTE B41 (Google Duo)

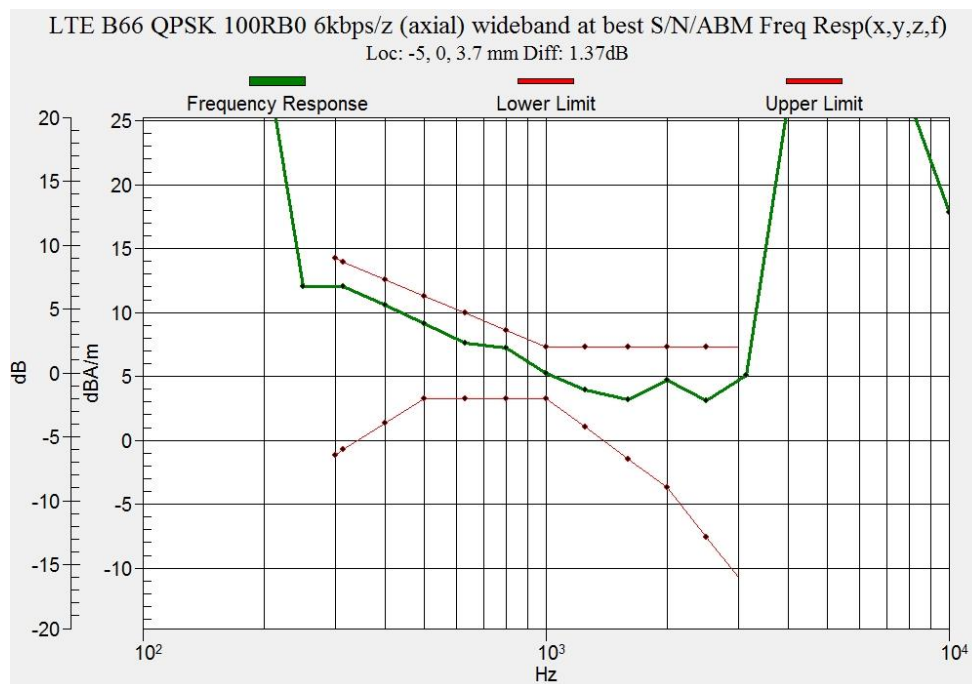


Figure B.25 Frequency Response of LTE B66 (Google Duo)

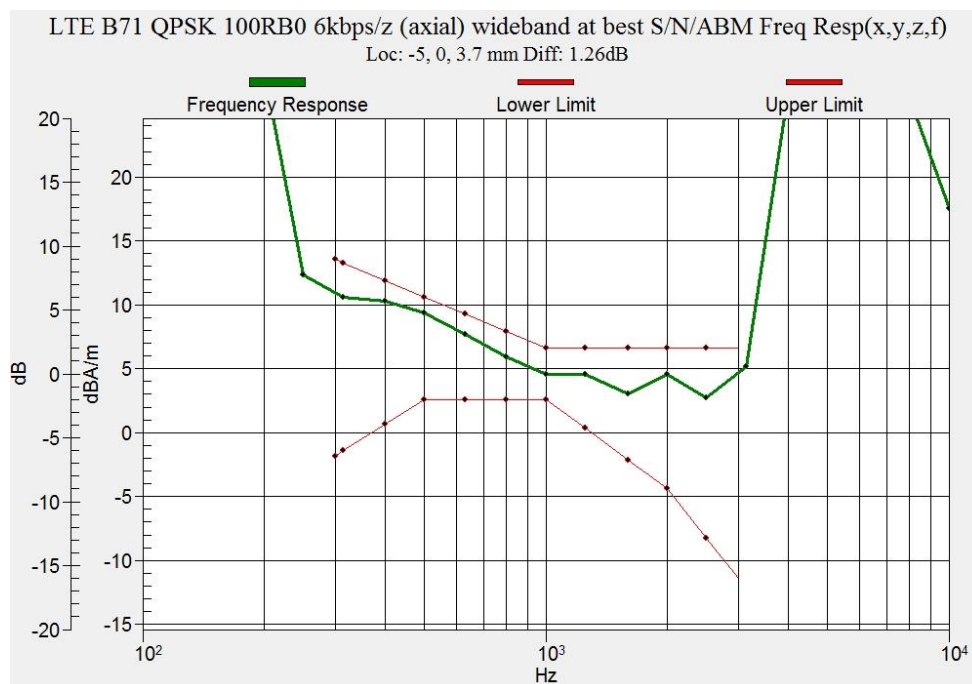


Figure B.26 Frequency Response of LTE B71 (Google Duo)

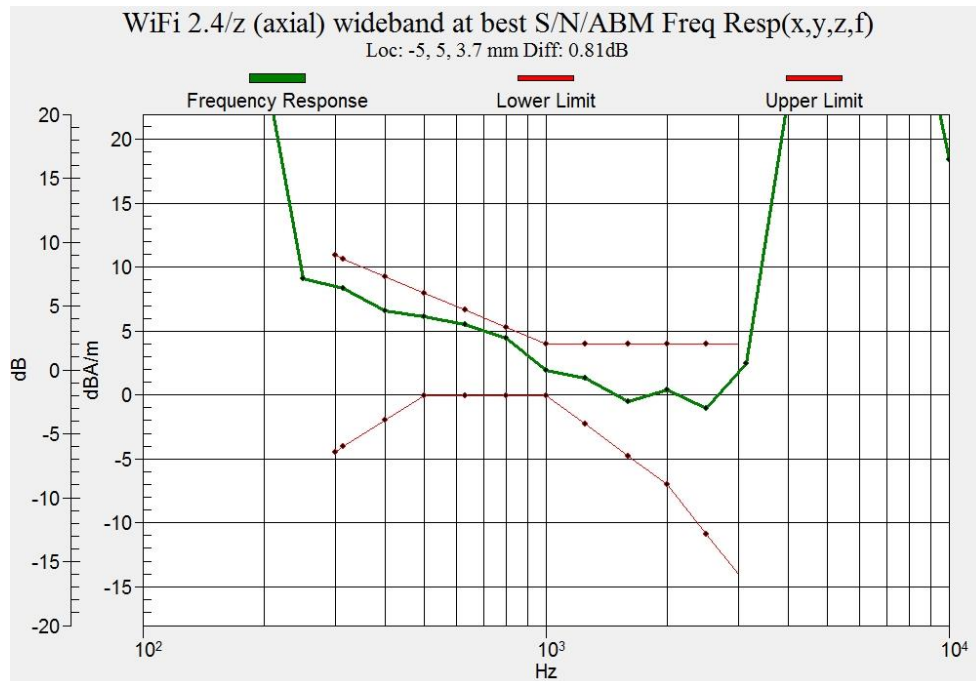


Figure B.27 Frequency Response of WIFI 2.4G (Google Duo)

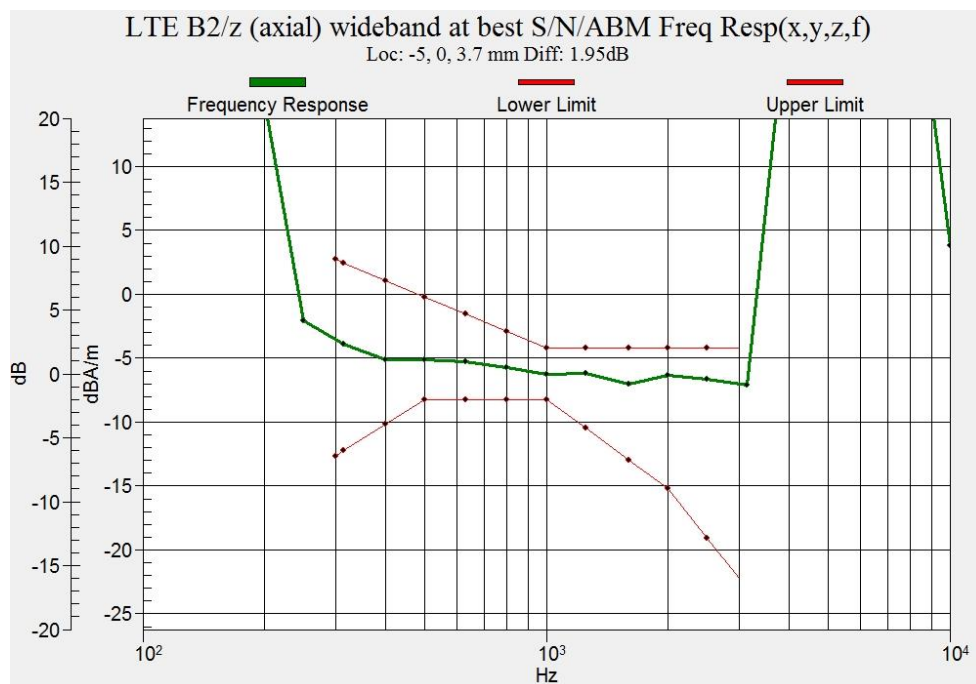


Figure B.28 Frequency Response of LTE B2

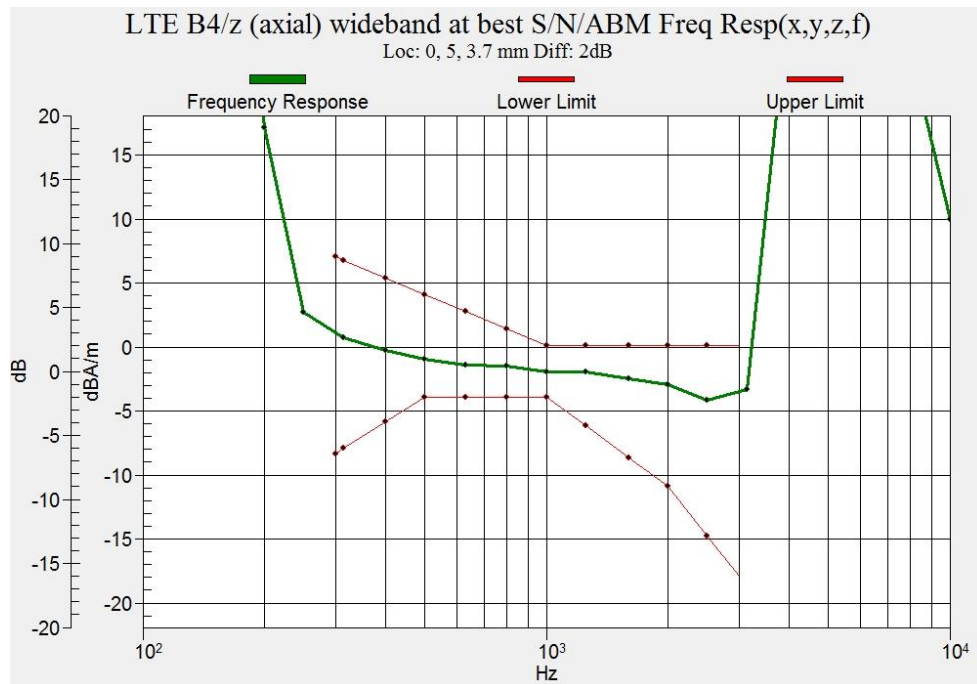


Figure B.29 Frequency Response of LTE B4

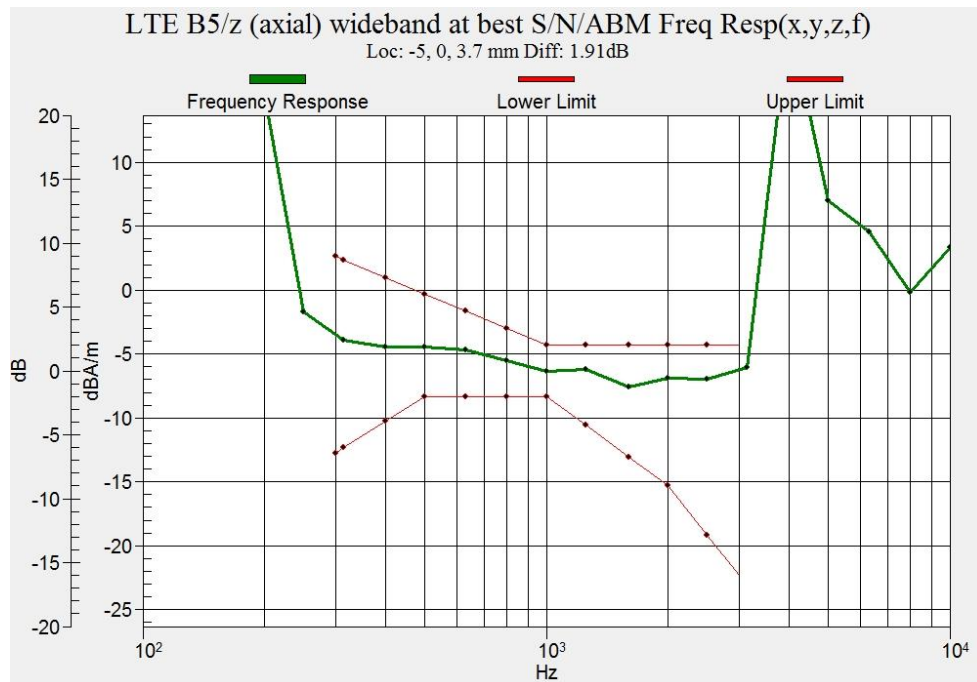


Figure B.30 Frequency Response of LTE B5

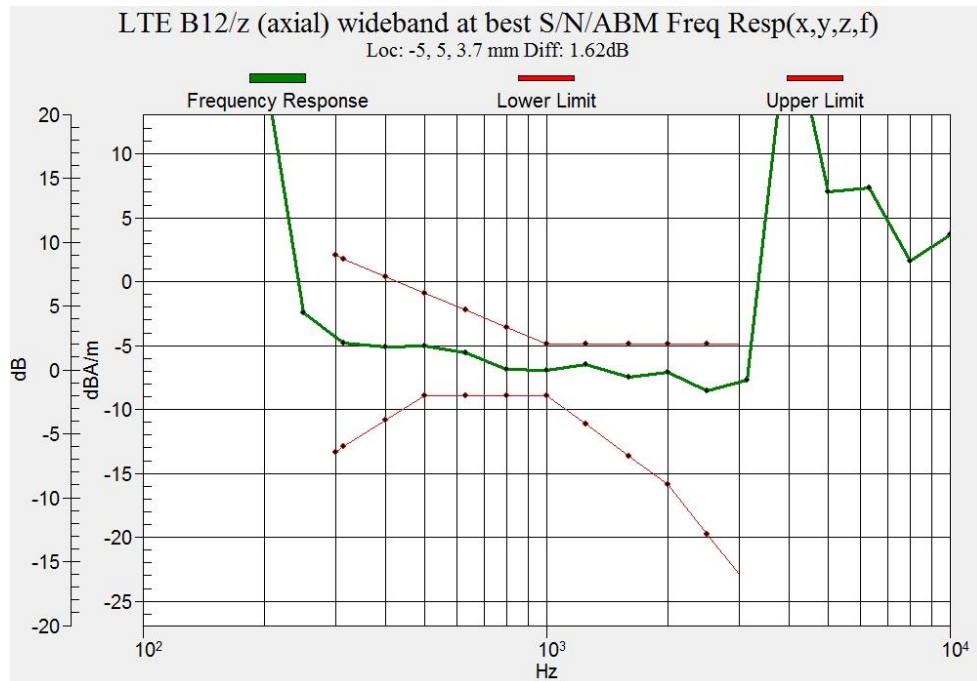


Figure B.31 Frequency Response of LTE B12

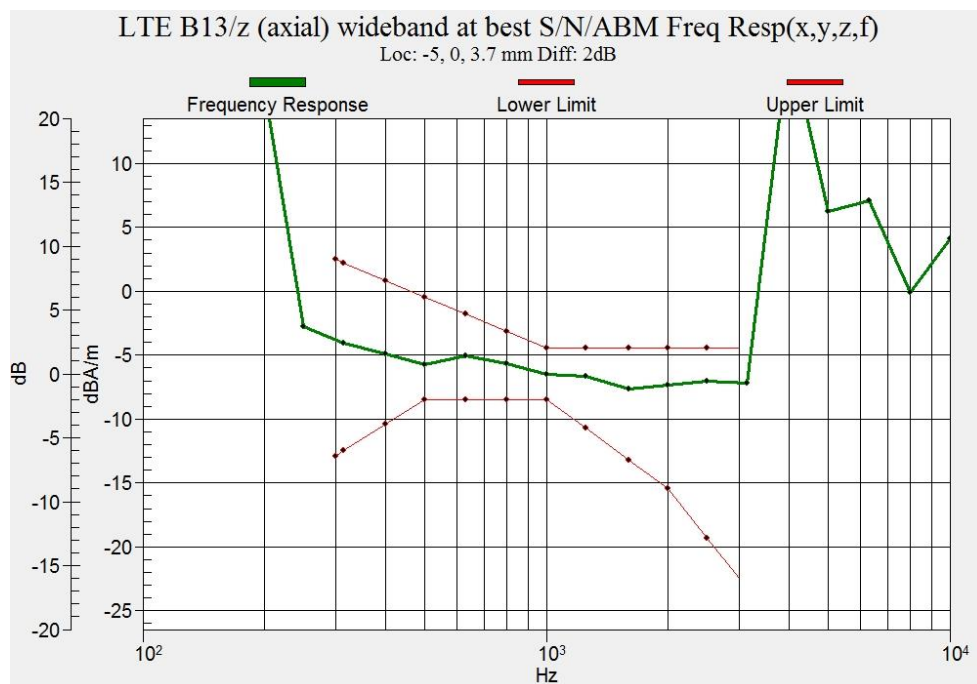


Figure B.32 Frequency Response of W LTE B13



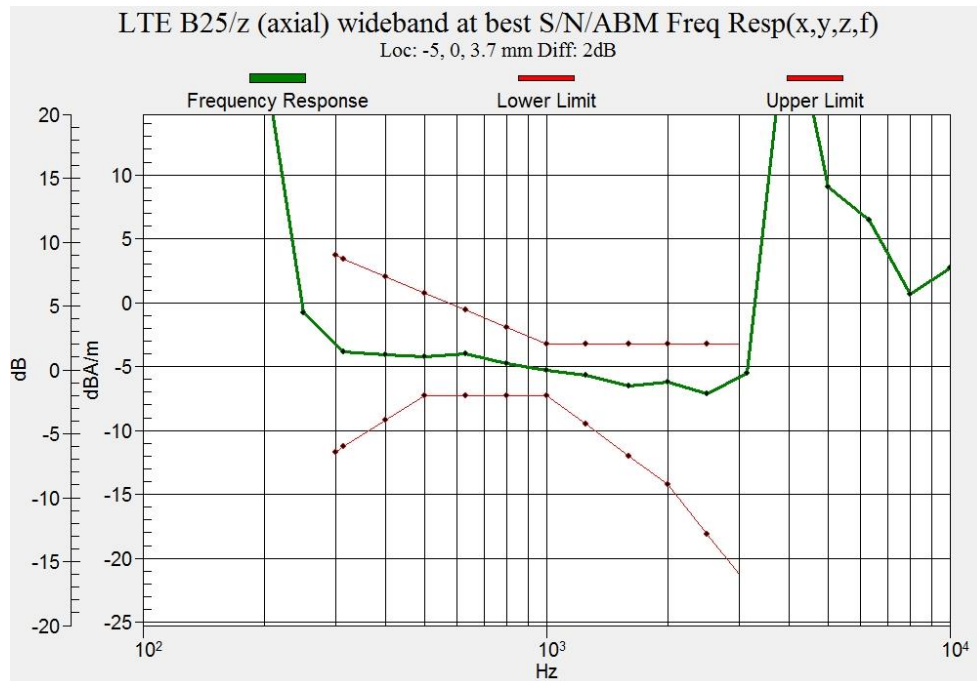


Figure B.33 Frequency Response of LTE B25

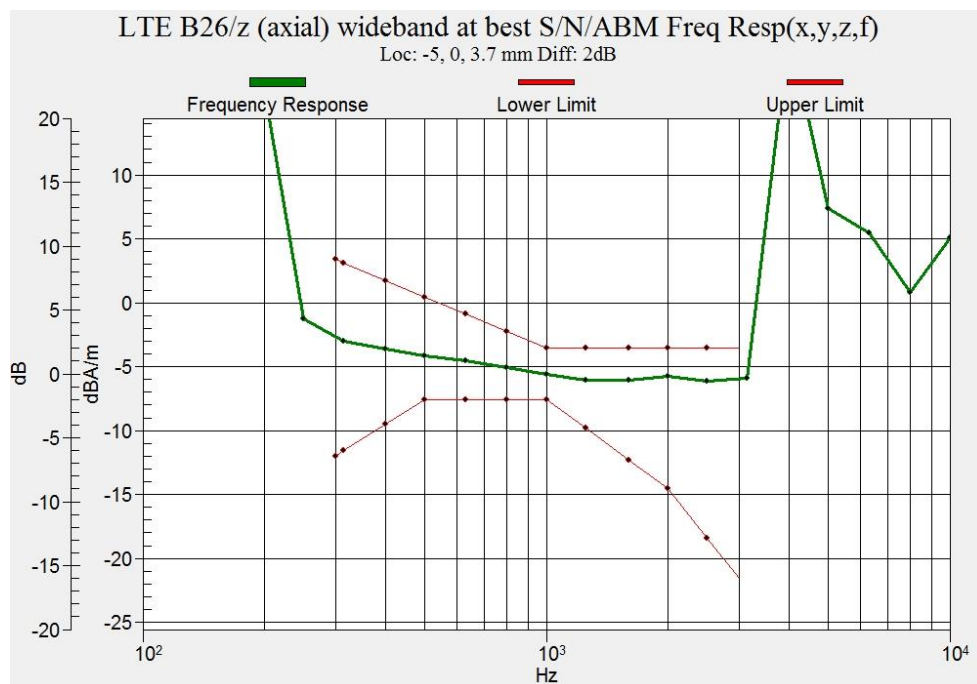


Figure B.34 Frequency Response of LTE B26

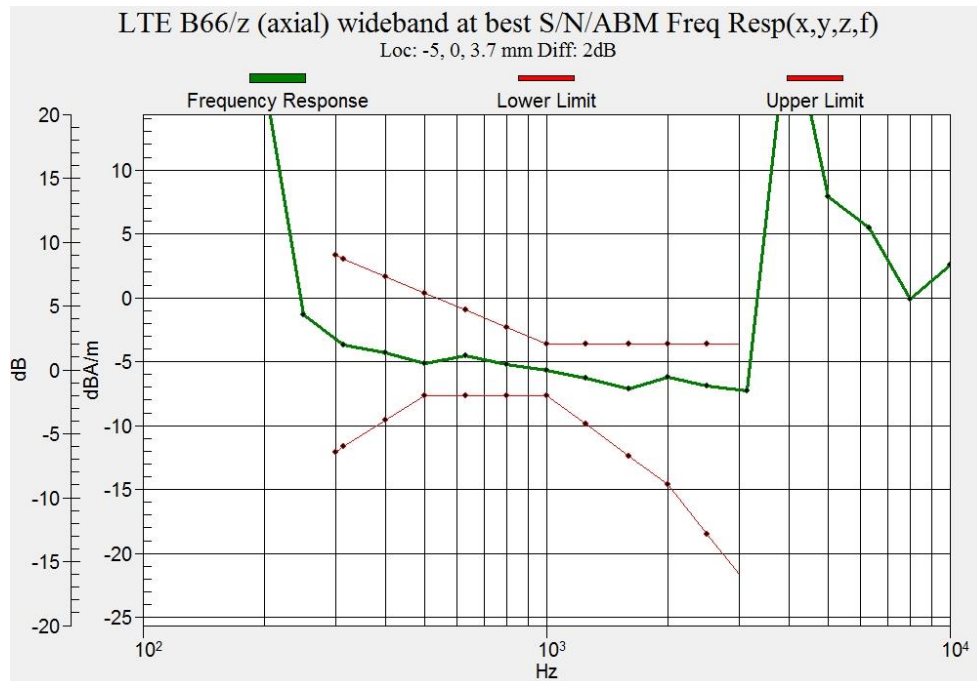


Figure B.35 Frequency Response of LTE B66

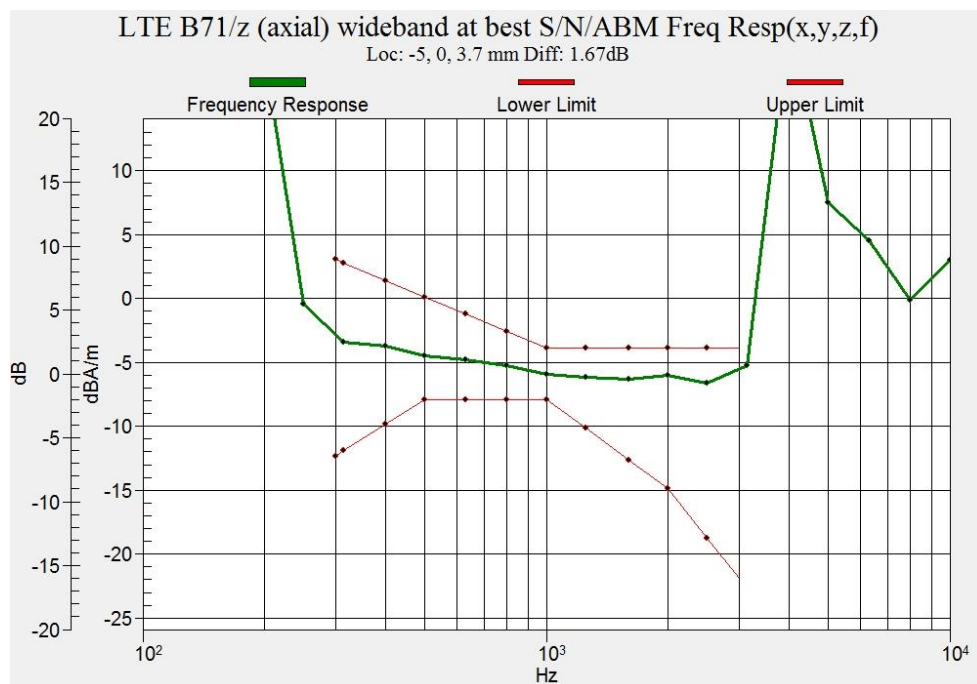


Figure B.36 Frequency Response of LTE B71



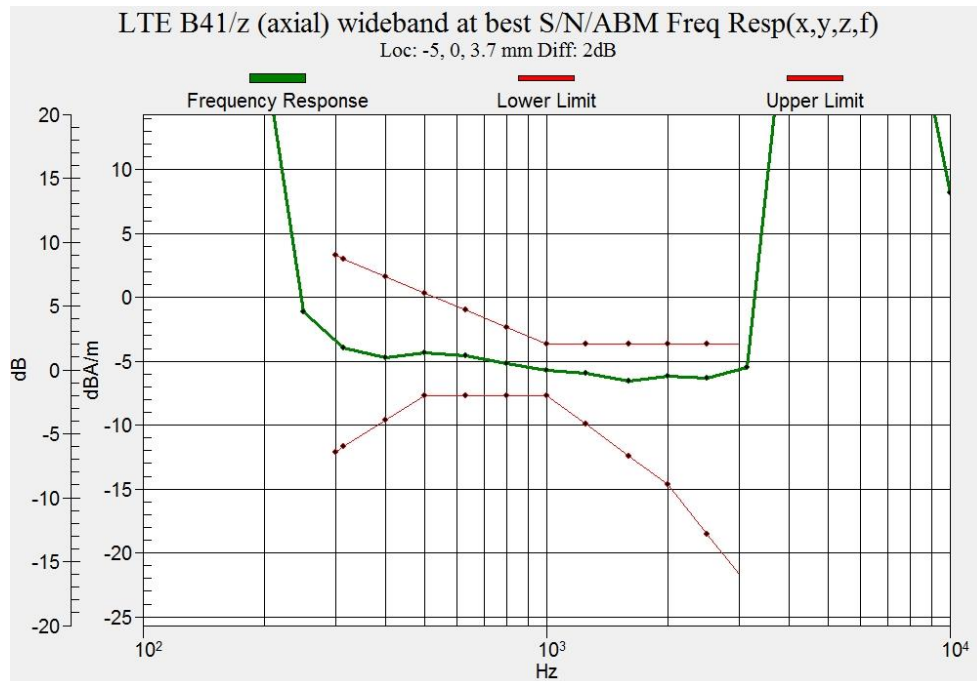


Figure B.37 Frequency Response of LTE B41

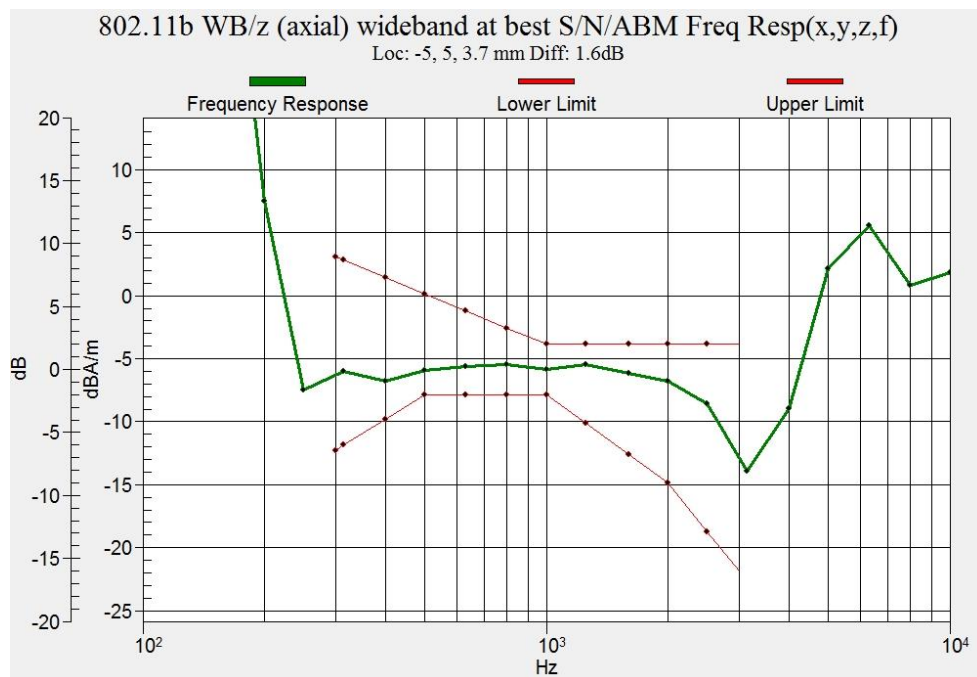


Figure B.38 Frequency Response of WIFI 2.4G



No. B20N00060-HAC T-coil

## 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 **CTTL-SZ (Auden)**

Certificate No: **AM1DV3-3086\_Feb18**

### 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, 2018**

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 ( $22 \pm 3$ )°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-17 (No. 21092)             | Aug-18                |
| Reference Probe AM1DV2          | SN: 1008    | 03-Jan-18 (No. AM1DV2-1008_Jan18) | Jan-19                |
| DAE4                            | SN: 781     | 17-Jan-18 (No. DAE4-781_Jan18)    | Jan-19                |
| Secondary Standards             | ID #        | Check Date (in house)             | Scheduled Check       |
| AMCC                            | SN: 1050    | 01-Oct-13 (in house check Oct-17) | Oct-19                |
| AMMI Audio Measuring Instrument | SN: 1062    | 26-Sep-12 (in house check Oct-17) | Oct-19                |

|                |                             |                                          |               |
|----------------|-----------------------------|------------------------------------------|---------------|
| Calibrated by: | Name<br><b>Leif Klysner</b> | Function<br><b>Laboratory Technician</b> | Signature<br> |
| Approved by:   | <b>Katja Pokovic</b>        | <b>Technical Manager</b>                 |               |

Issued: February 23, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: AM1DV3-3086\_Feb18

Page 1 of 3

**[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 |
| Manufacturing date    | May 28, 2010                                         |

#### Calibration data

|                          |                  |                   |                 |
|--------------------------|------------------|-------------------|-----------------|
| Connector rotation angle | (in DASY system) | 204.7°            | +/- 3.6 ° (k=2) |
| Sensor angle             | (in DASY system) | 0.95 °            | +/- 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: Accreditation Certificate**



**Accredited Laboratory**

A2LA has accredited

**SHENZHEN ACADEMY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY**

*Shenzhen, People's Republic of China*

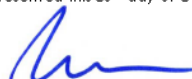
for technical competence in the field of

**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 30<sup>th</sup> day of October 2019.



Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 4353.01  
Valid to November 30, 2021

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

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