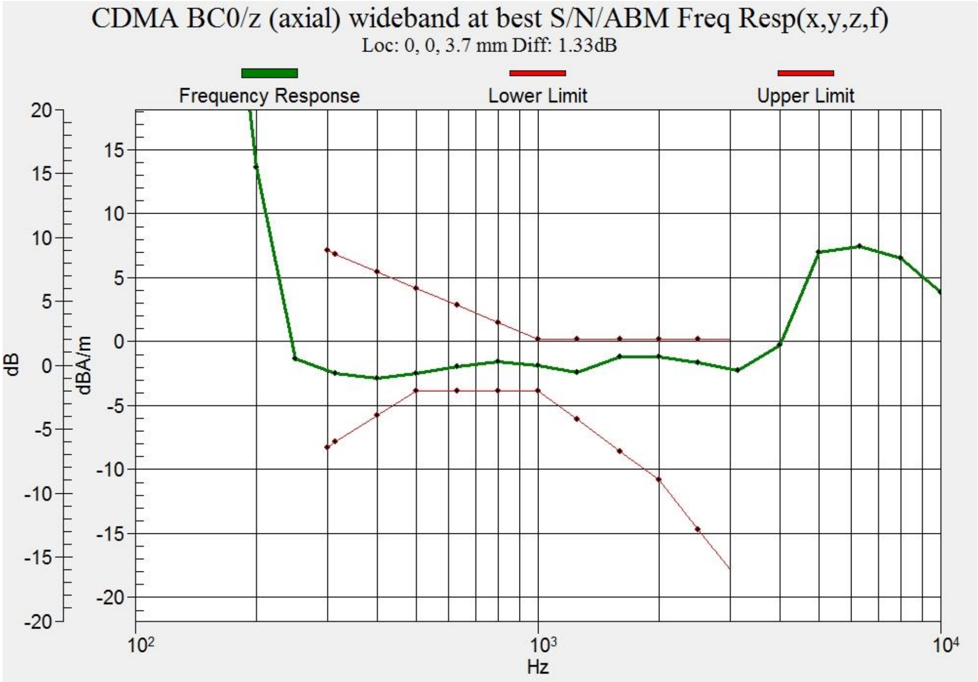

Figure B.3 Frequency Response of CDMA BC0

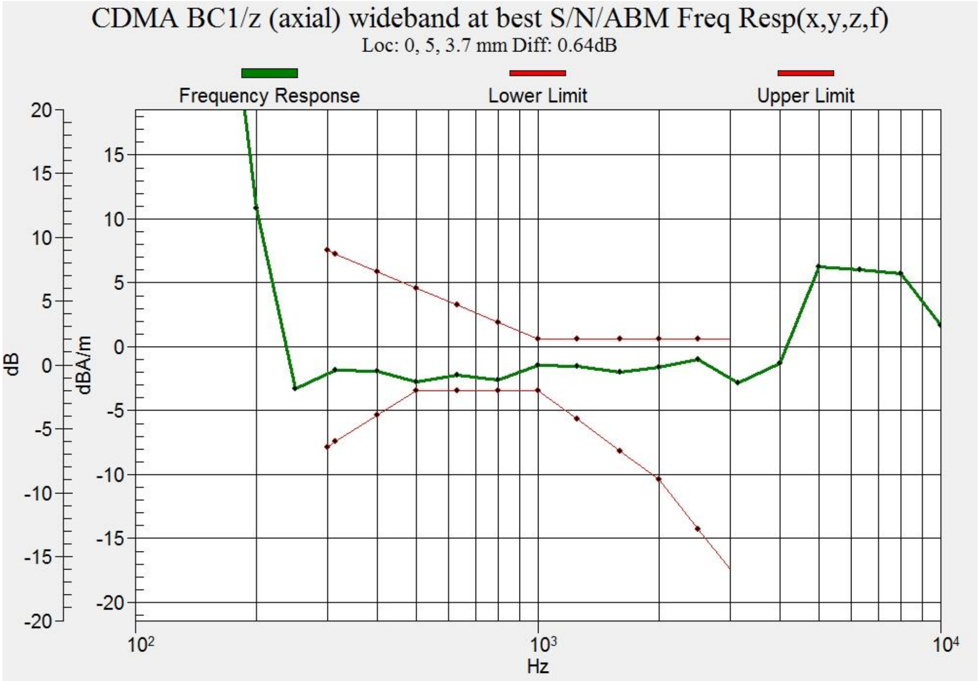

Figure B.4 Frequency Response of CDMA BC1

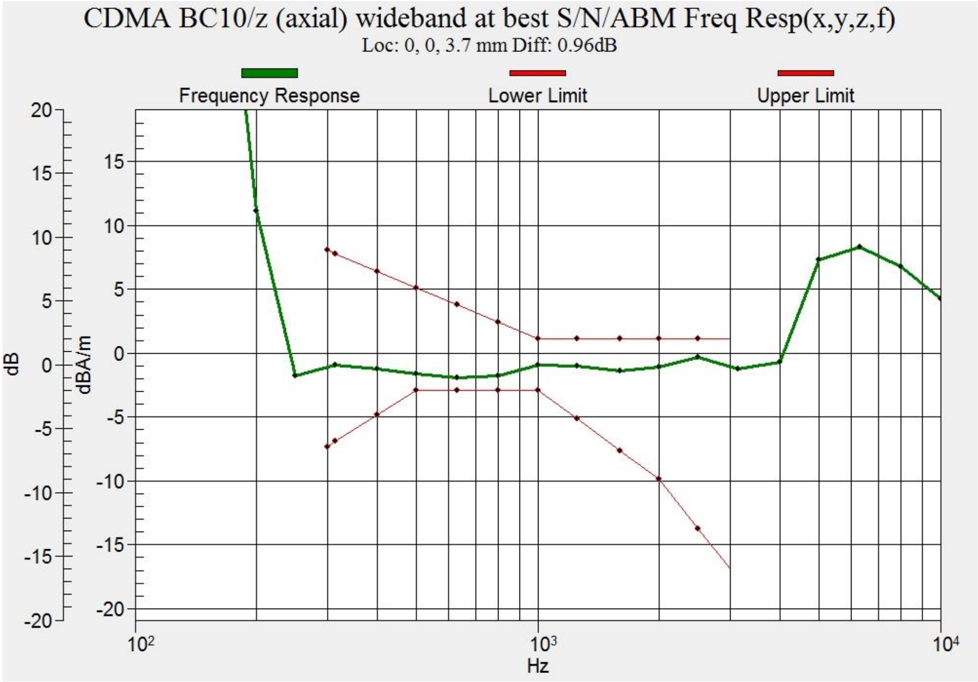

Figure B.5 Frequency Response of CDMA BC10

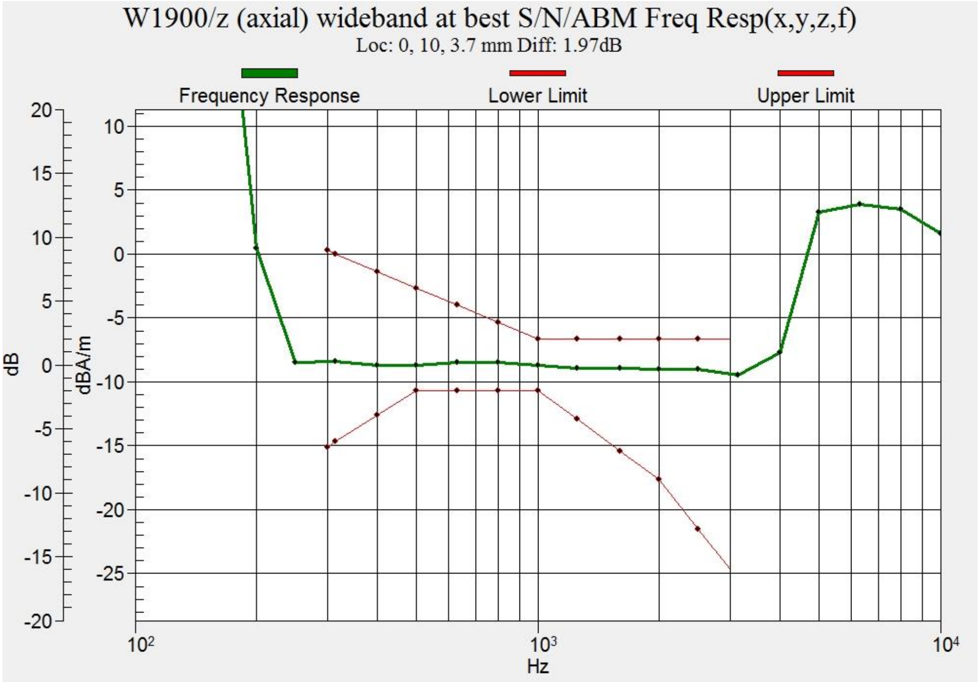

Figure B.6 Frequency Response of WCDMA B2

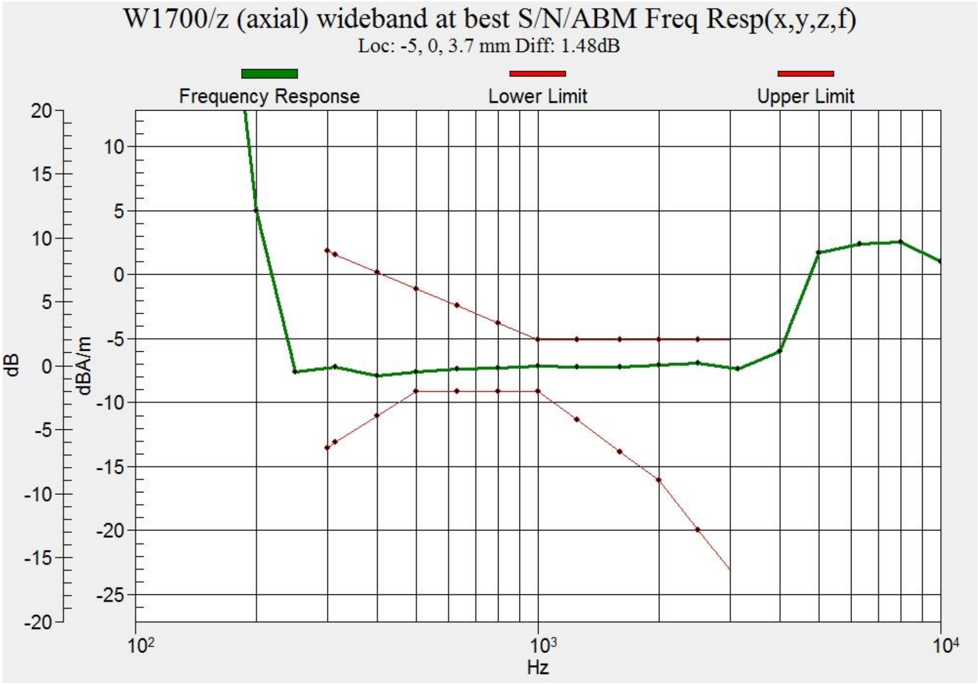

Figure B.7 Frequency Response of WCDMA B4

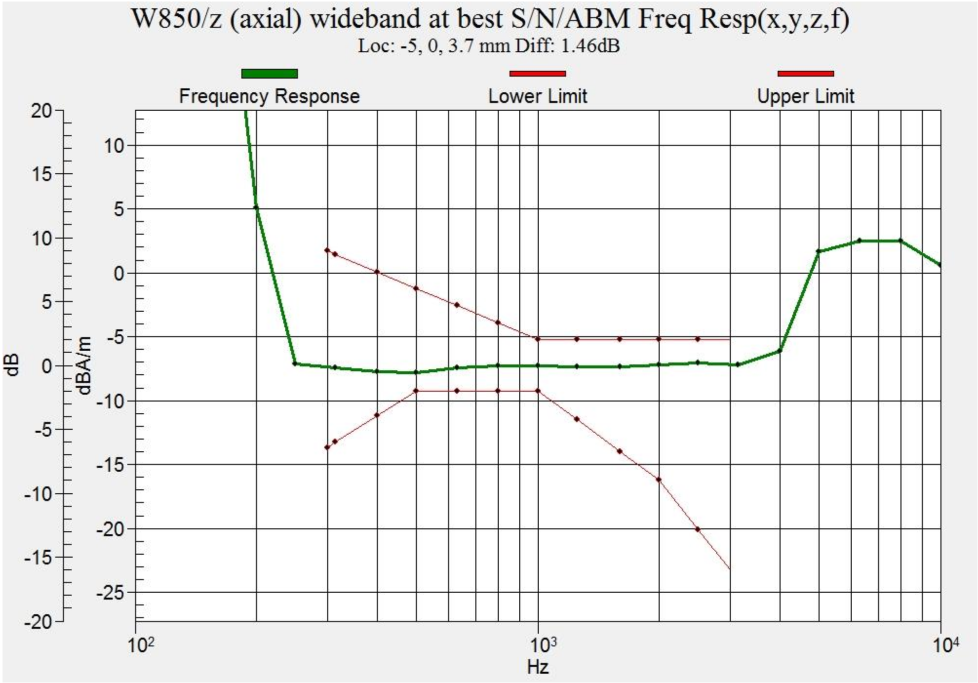

Figure B.8 Frequency Response of L WCDMA B5

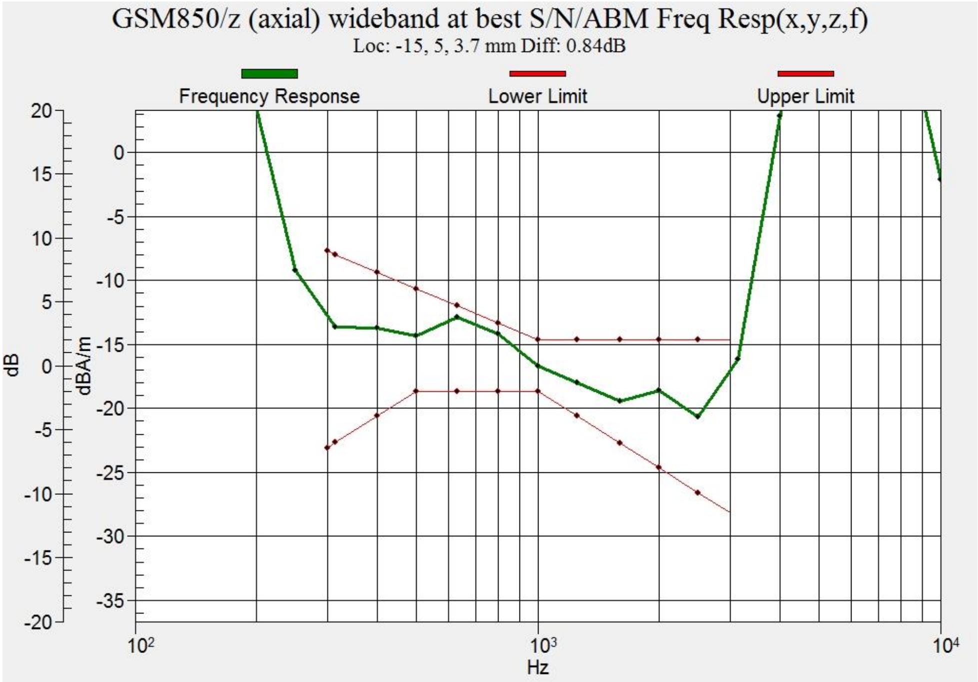

Figure B.9 Frequency Response of GSM850 (Google Duo)

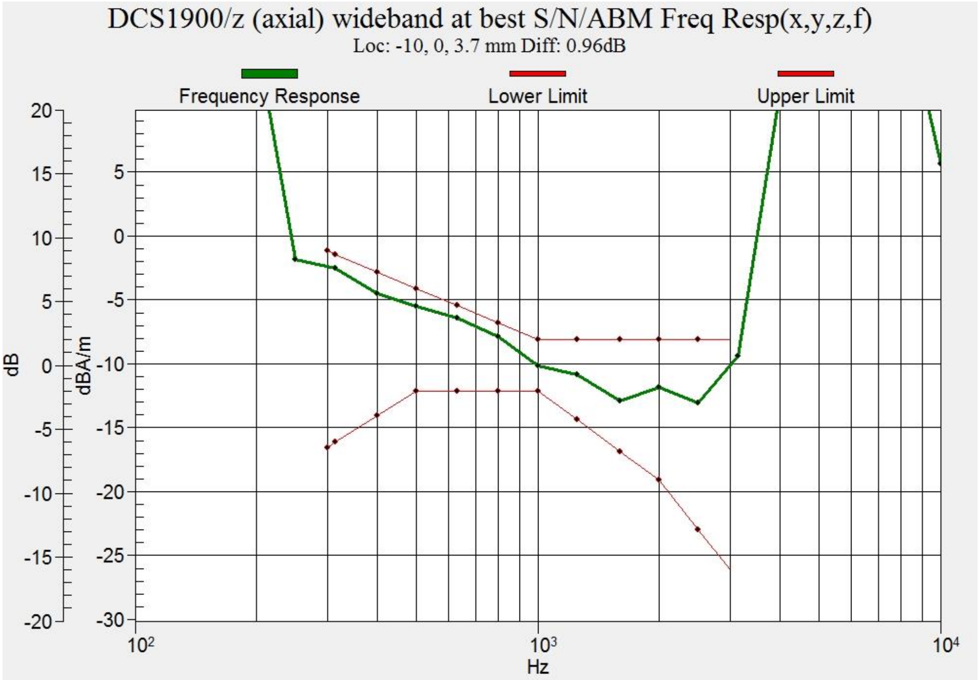

Figure B.10 Frequency Response of GSM1900 (Google Duo)

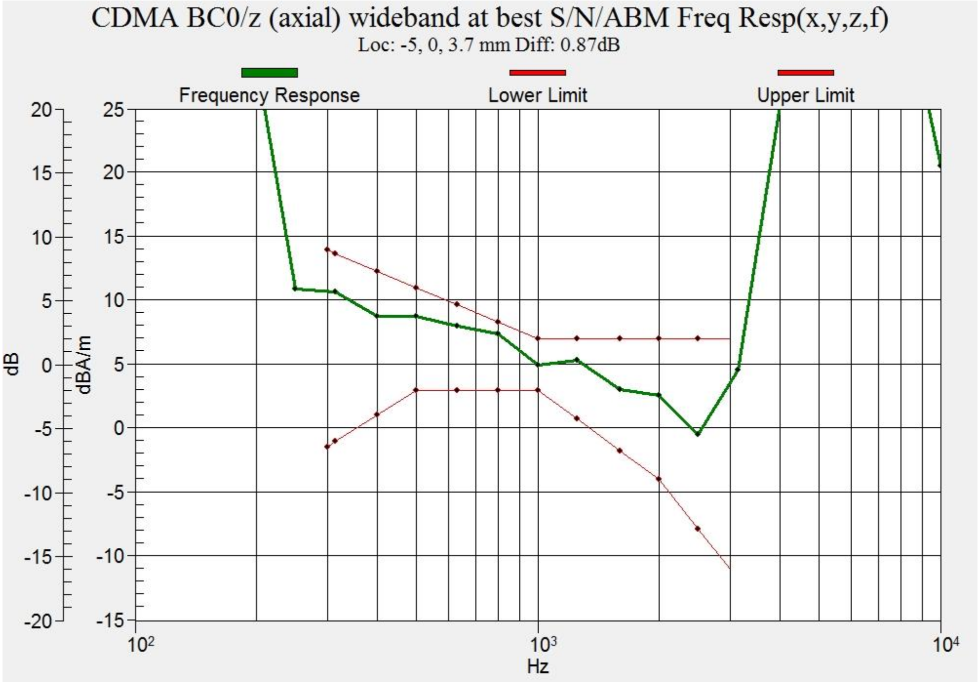

Figure B.11 Frequency Response of CDMA BC0 (Google Duo)

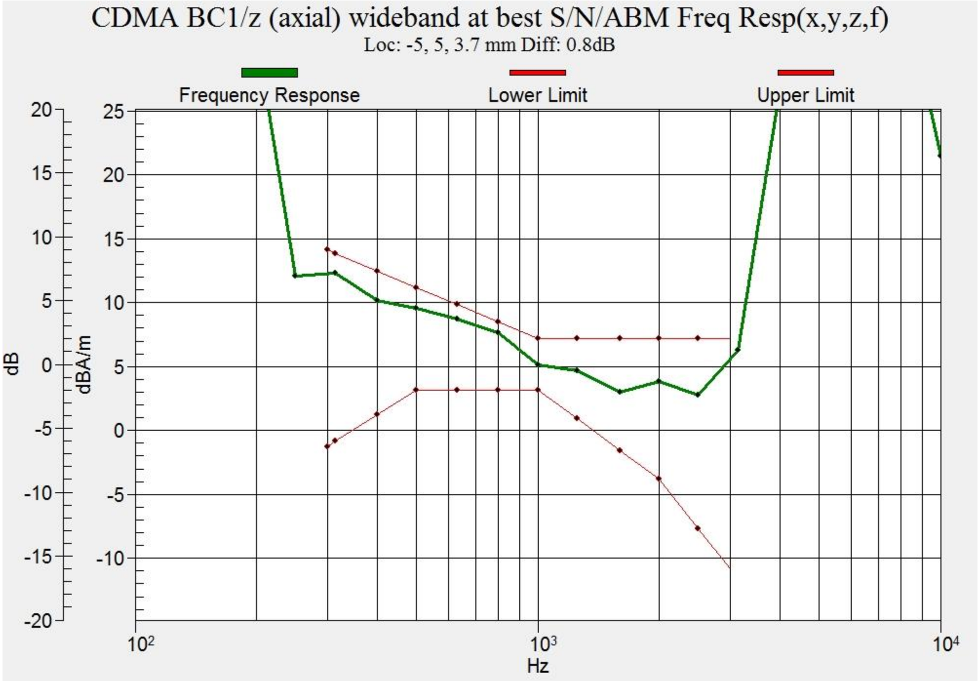

Figure B.12 Frequency Response of CDMA BC1 (Google Duo)

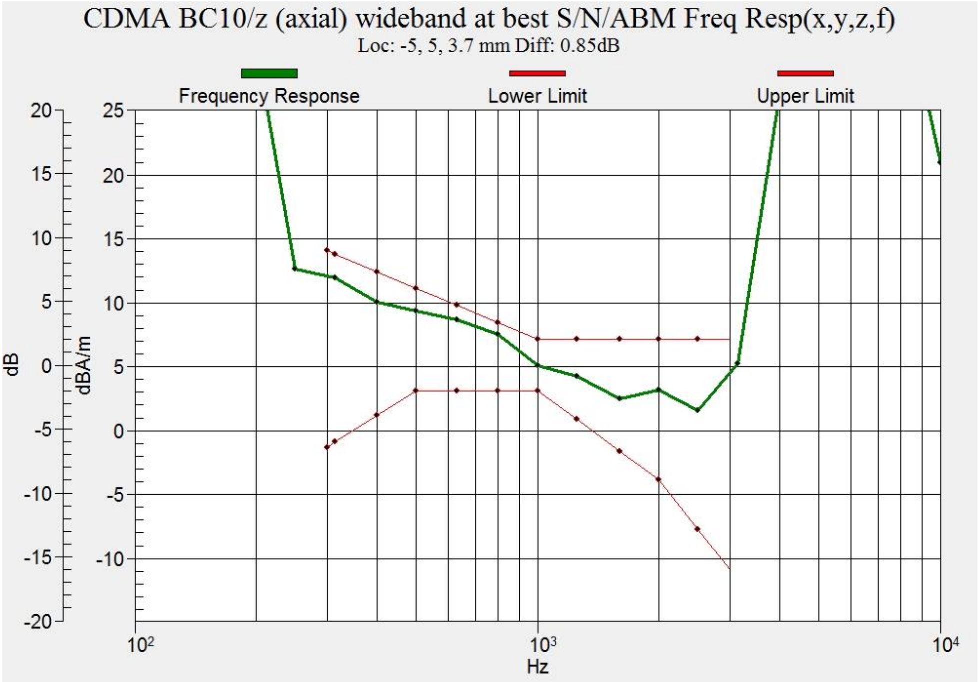

Figure B.13 Frequency Response of CDMA BC10 (Google Duo)

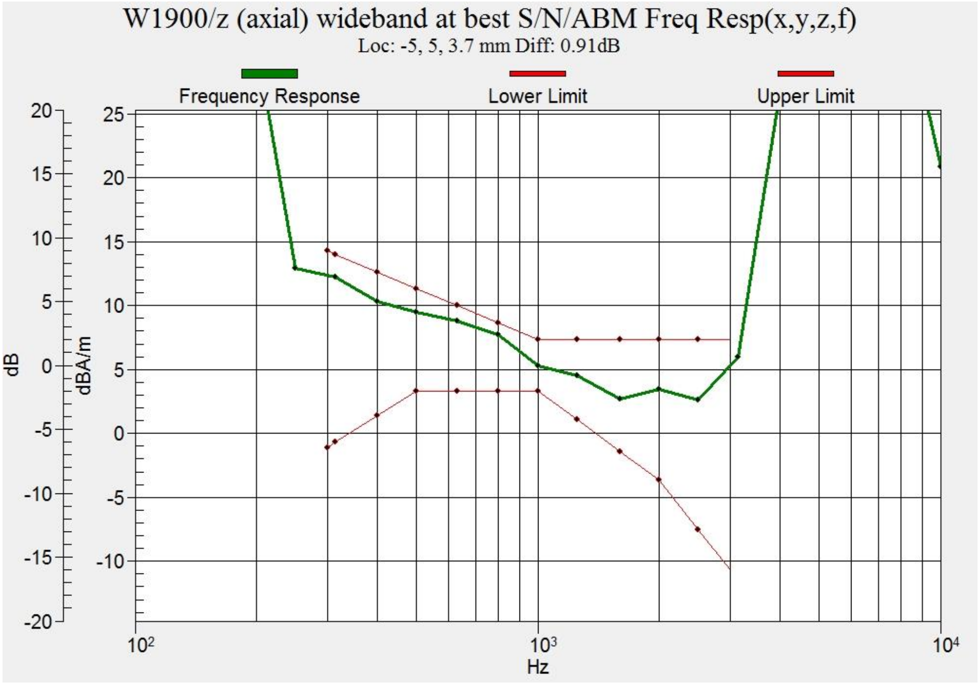

Figure B.14 Frequency Response of WCDMA B2 (Google Duo)

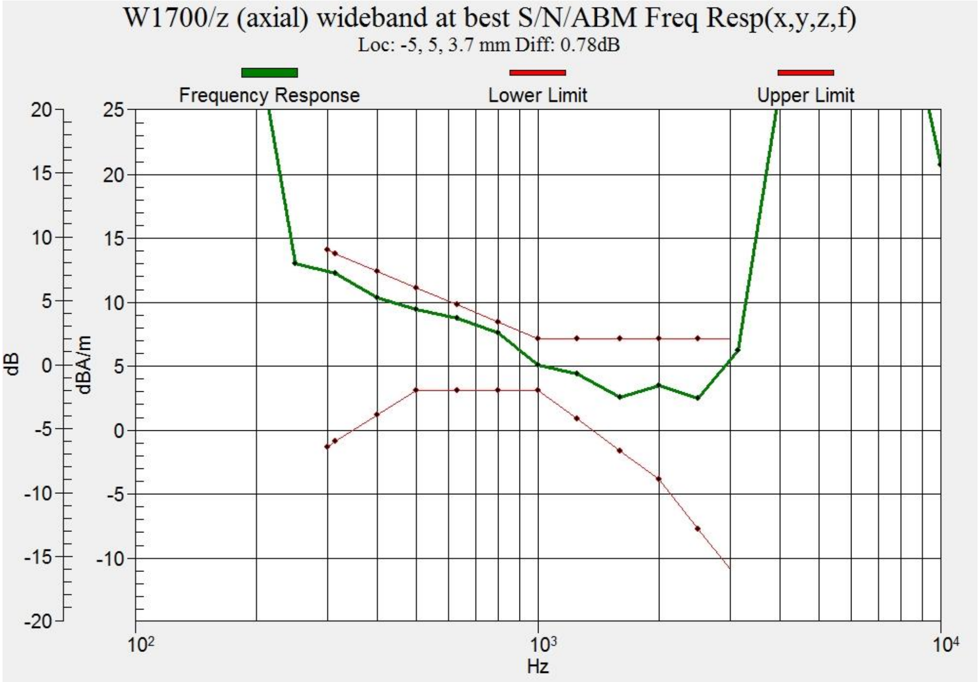

Figure B.15 Frequency Response of WCDMA B4 (Google Duo)

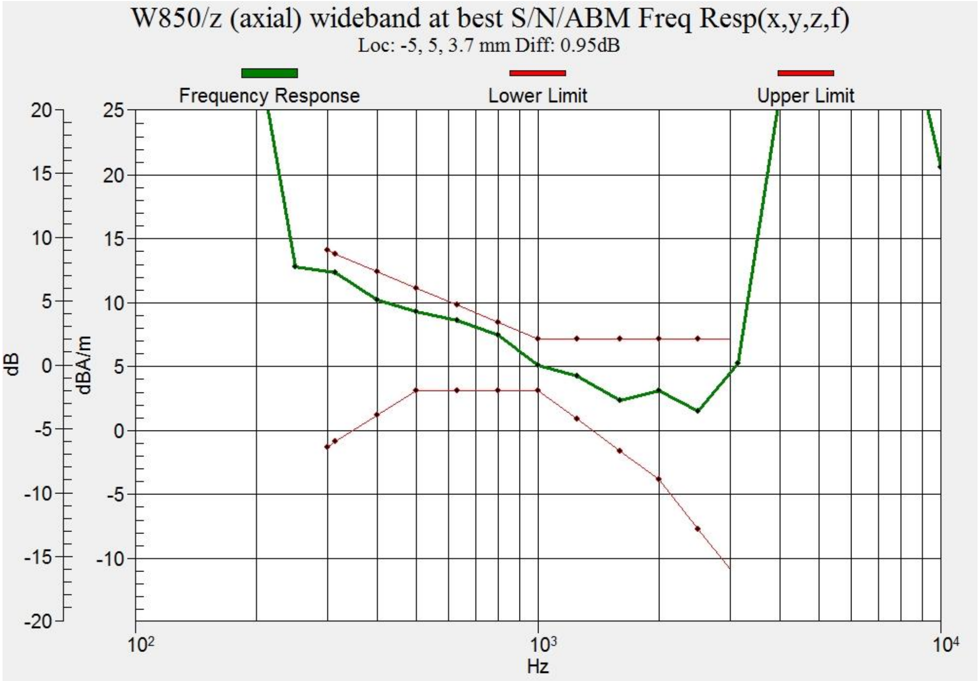

Figure B.16 Frequency Response of WCDMA B5 (Google Duo)

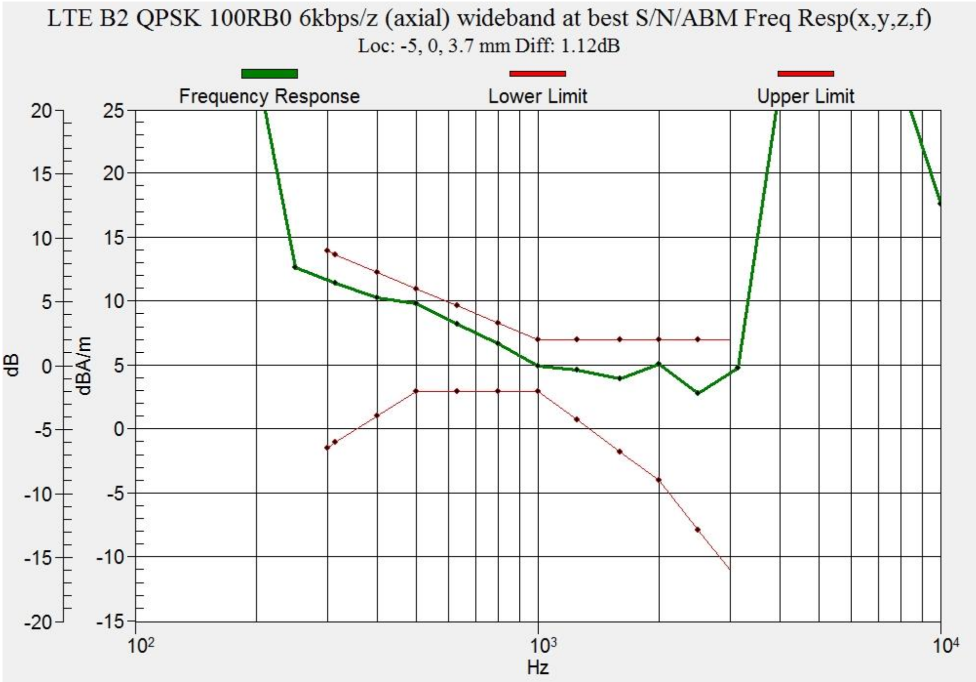

Figure B.17 Frequency Response of LTE B2 (Google Duo)

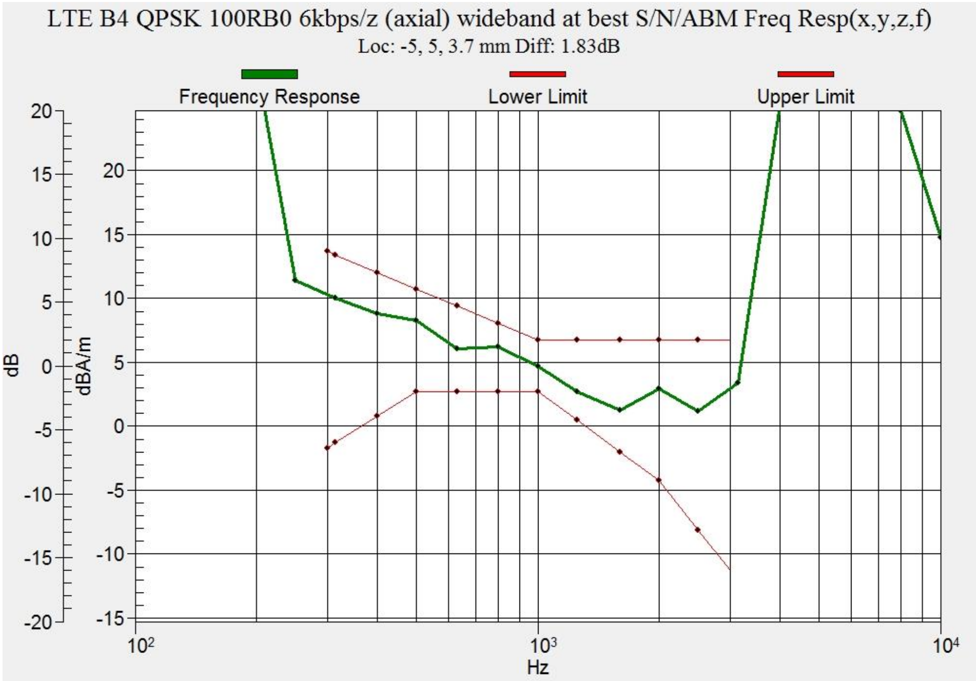

Figure B.18 Frequency Response of LTE B4 (Google Duo)

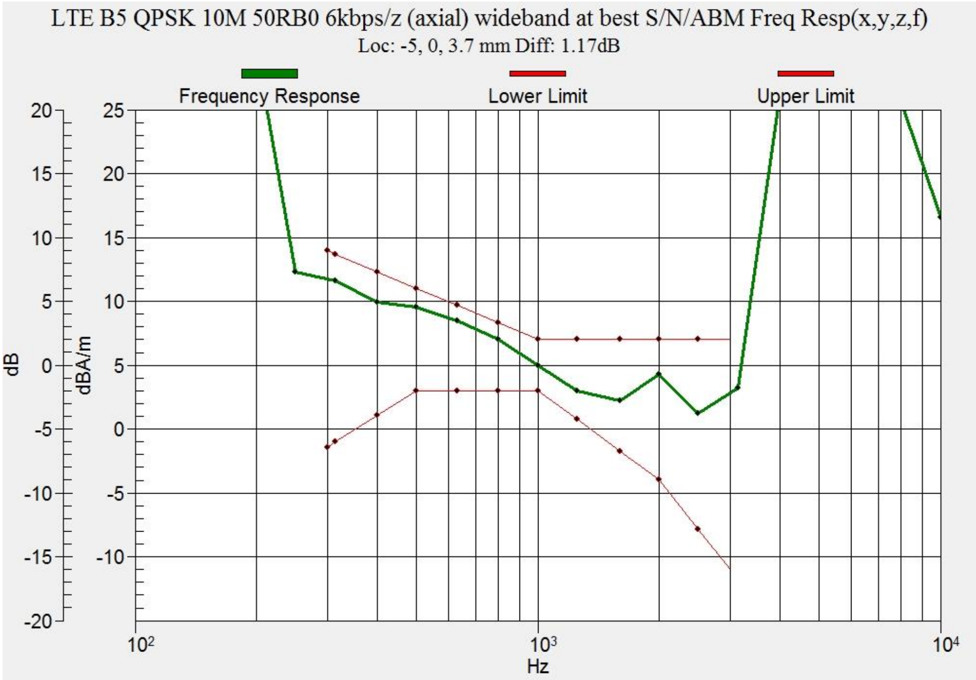

Figure B.19 Frequency Response of LTE B5 (Google Duo)

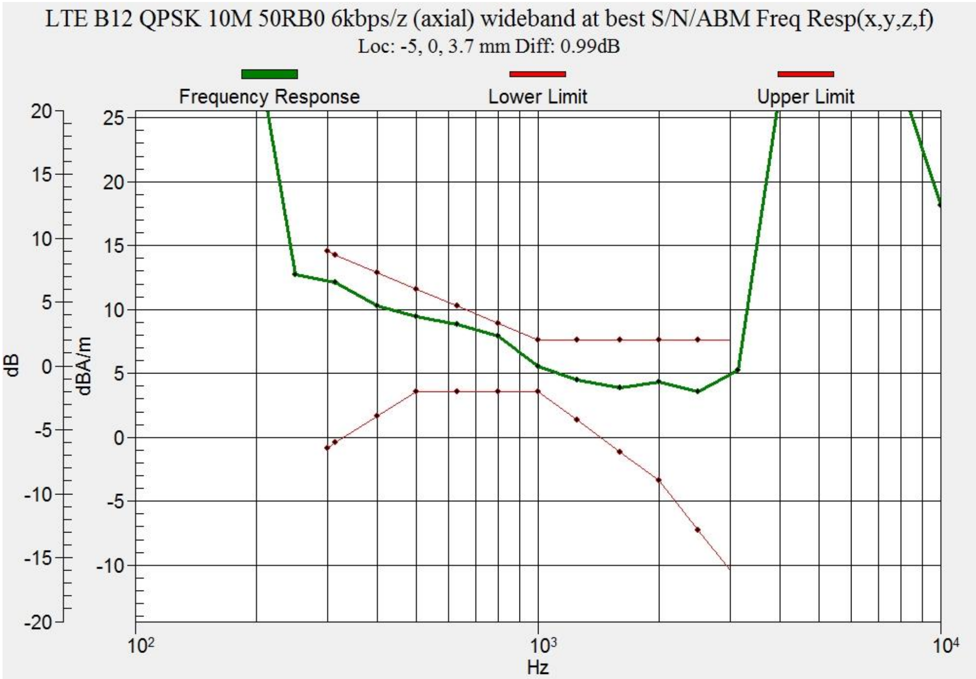

Figure B.20 Frequency Response of LTE B12 (Google Duo)

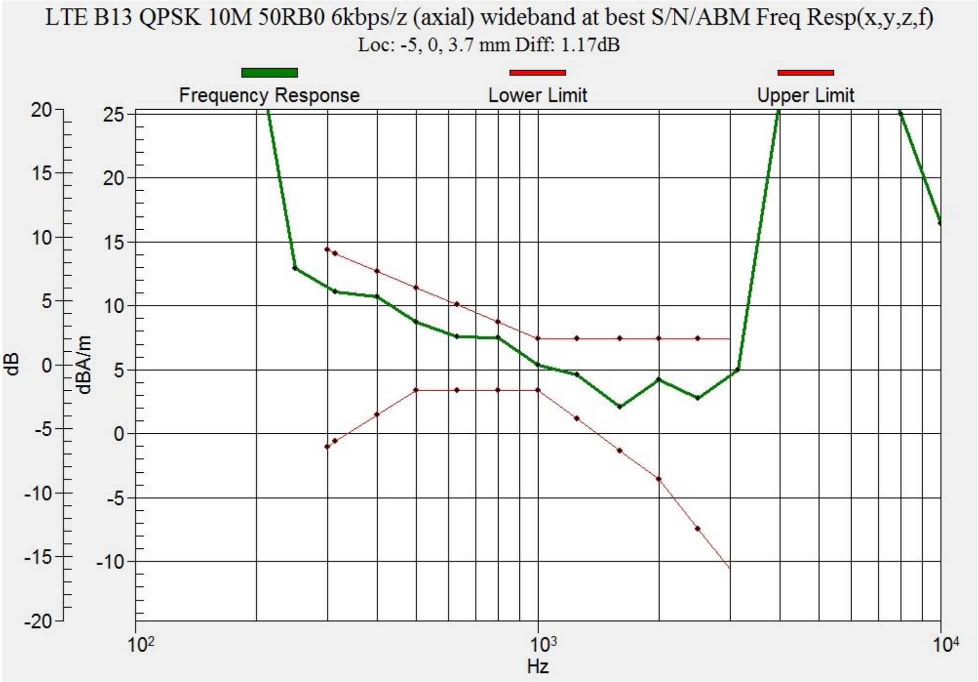

Figure B.21 Frequency Response of W LTE B13 (Google Duo)

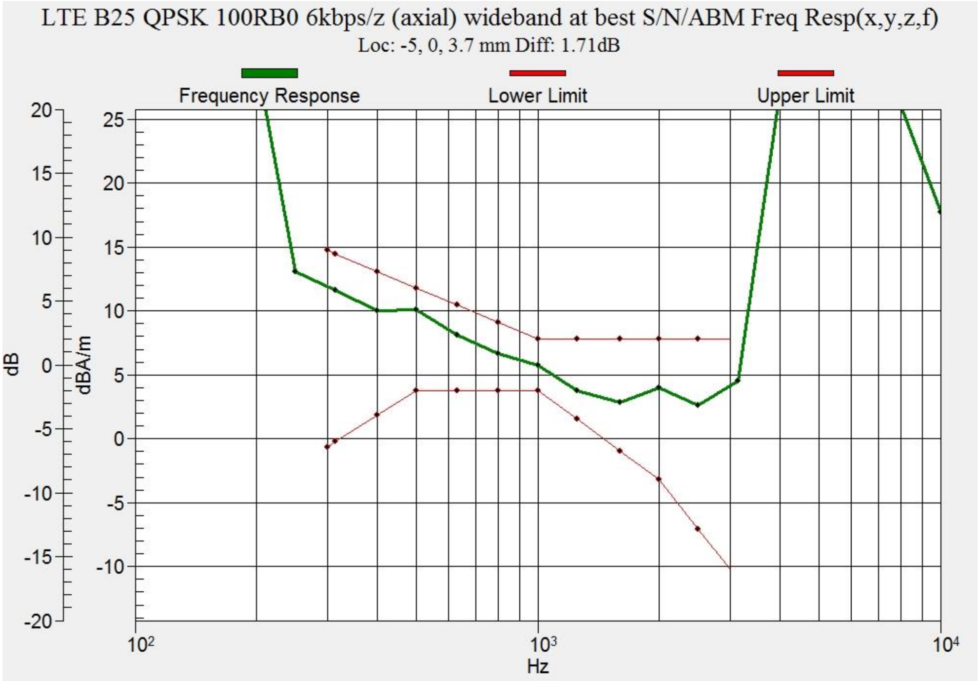

Figure B.22 Frequency Response of LTE B25 (Google Duo)

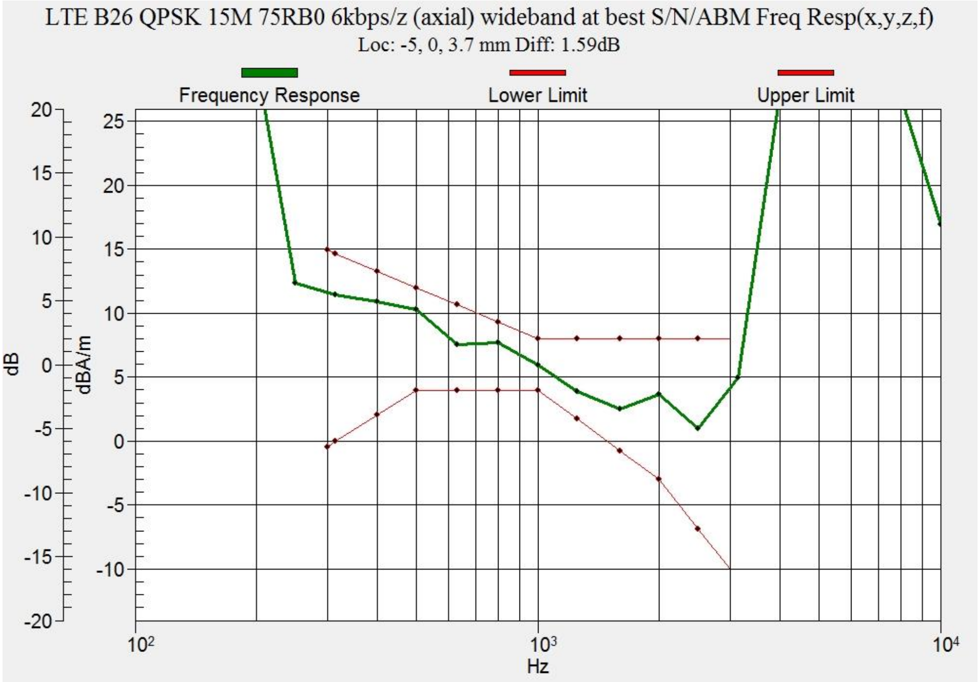

Figure B.23 Frequency Response of LTE B26 (Google Duo)

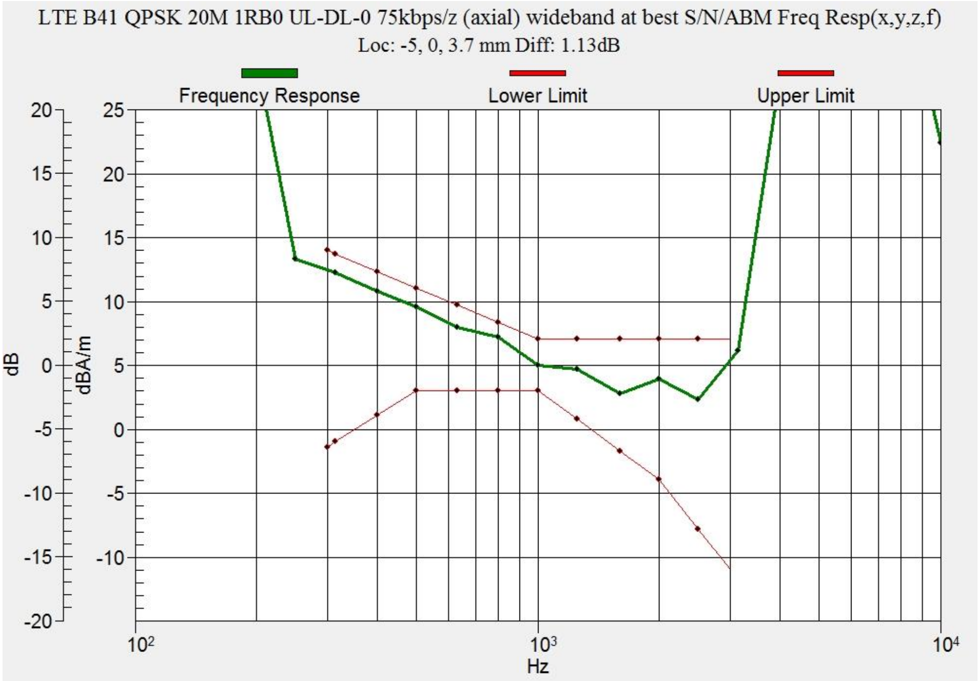

Figure B.24 Frequency Response of LTE B41 (Google Duo)

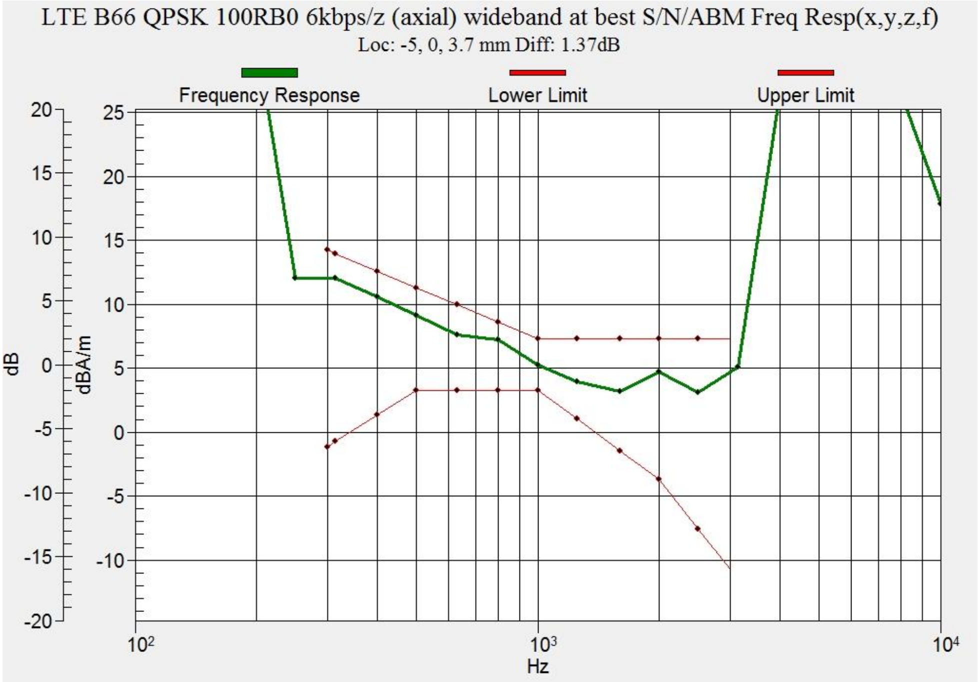

Figure B.25 Frequency Response of LTE B66 (Google Duo)

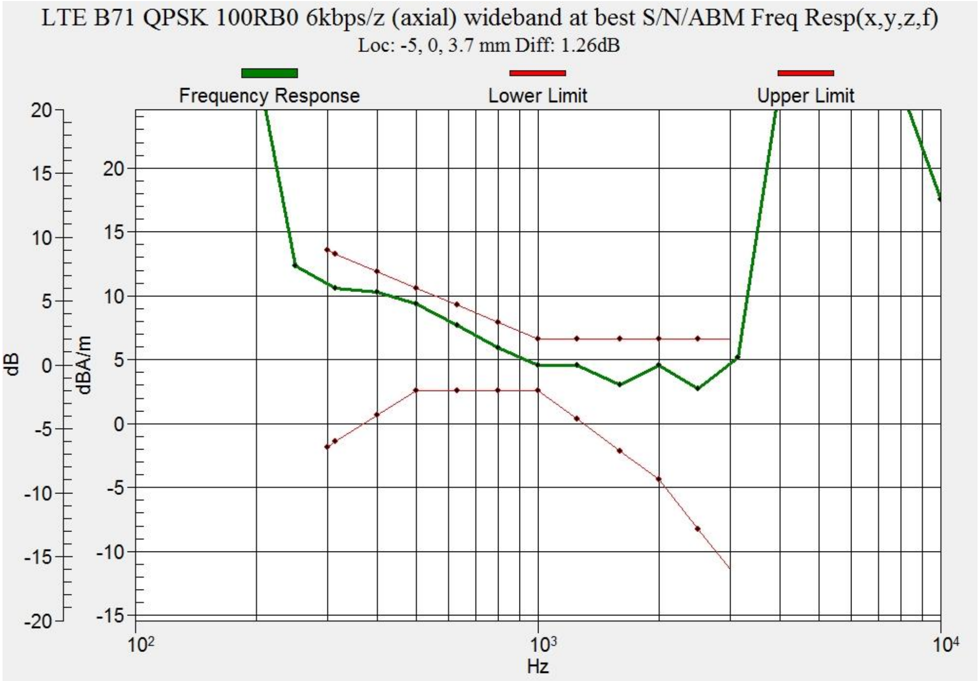

Figure B.26 Frequency Response of LTE B71 (Google Duo)

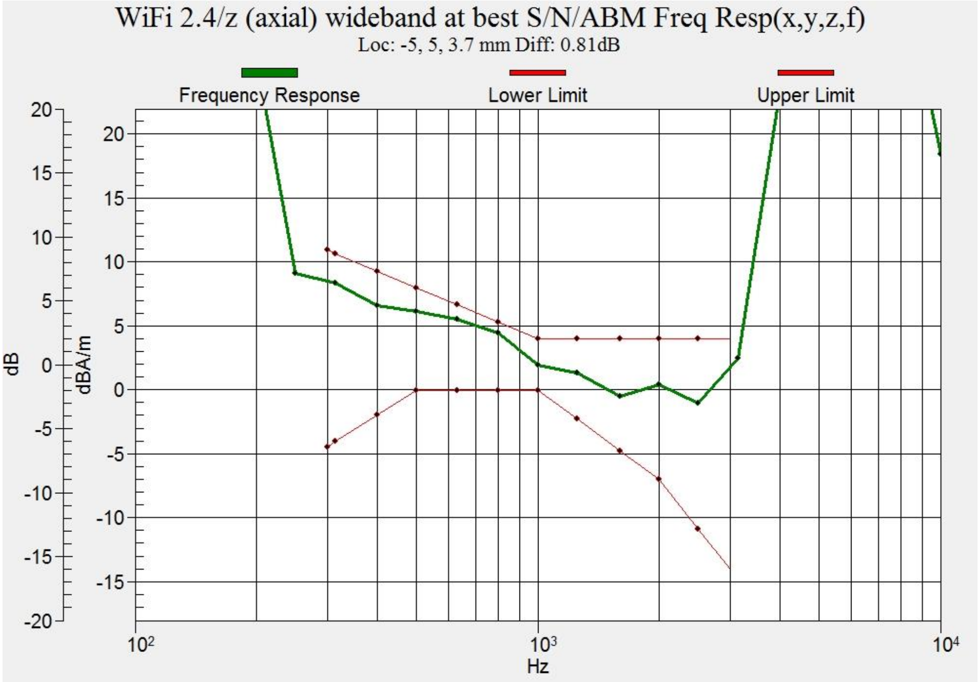

Figure B.27 Frequency Response of WIFI 2.4G (Google Duo)

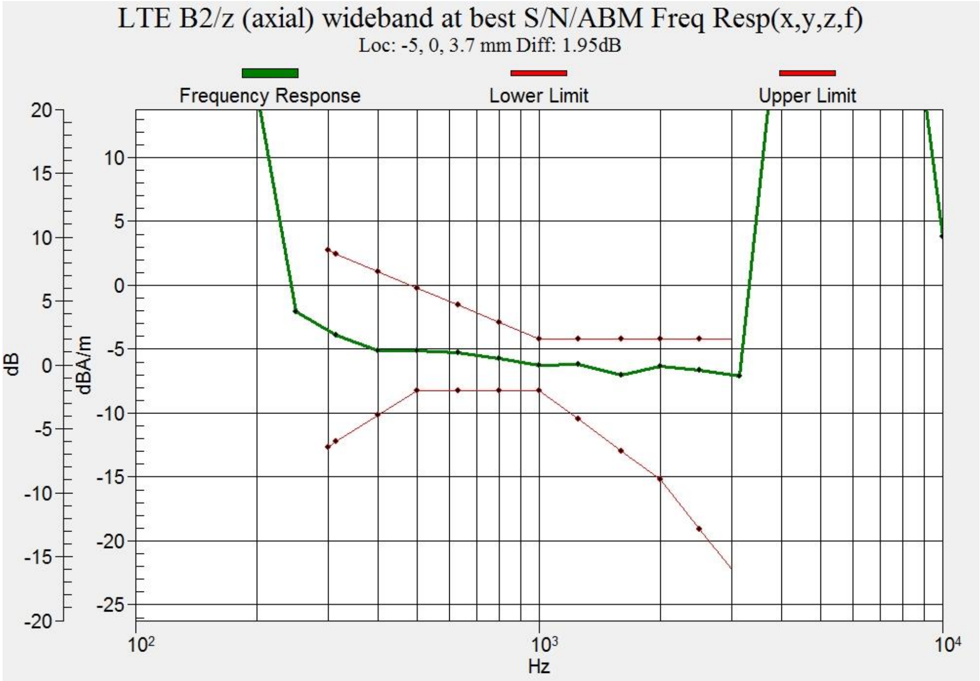

Figure B.28 Frequency Response of LTE B2

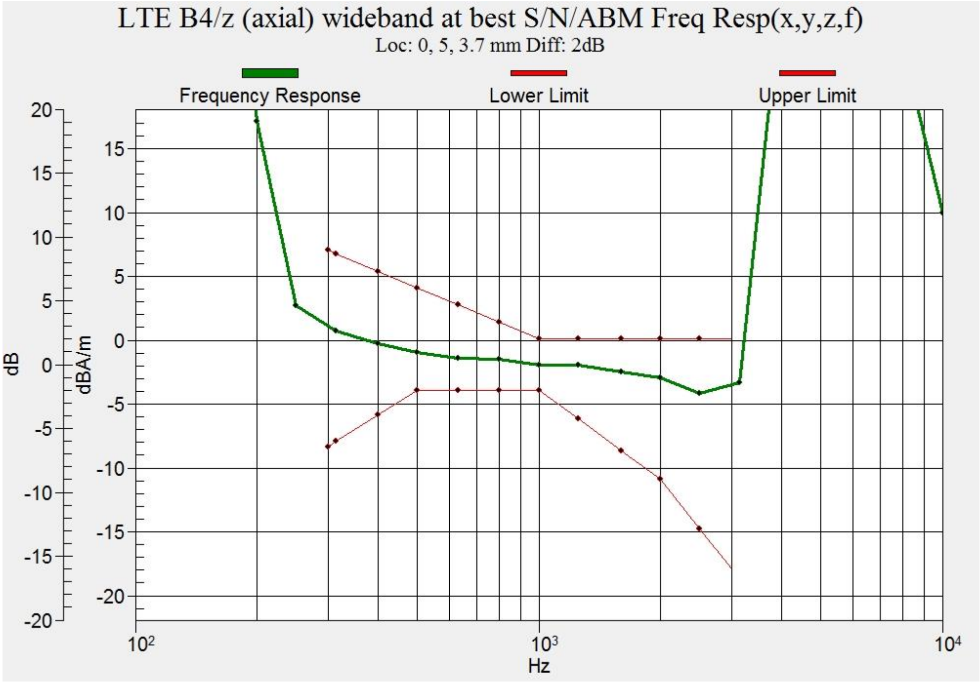

Figure B.29 Frequency Response of LTE B4

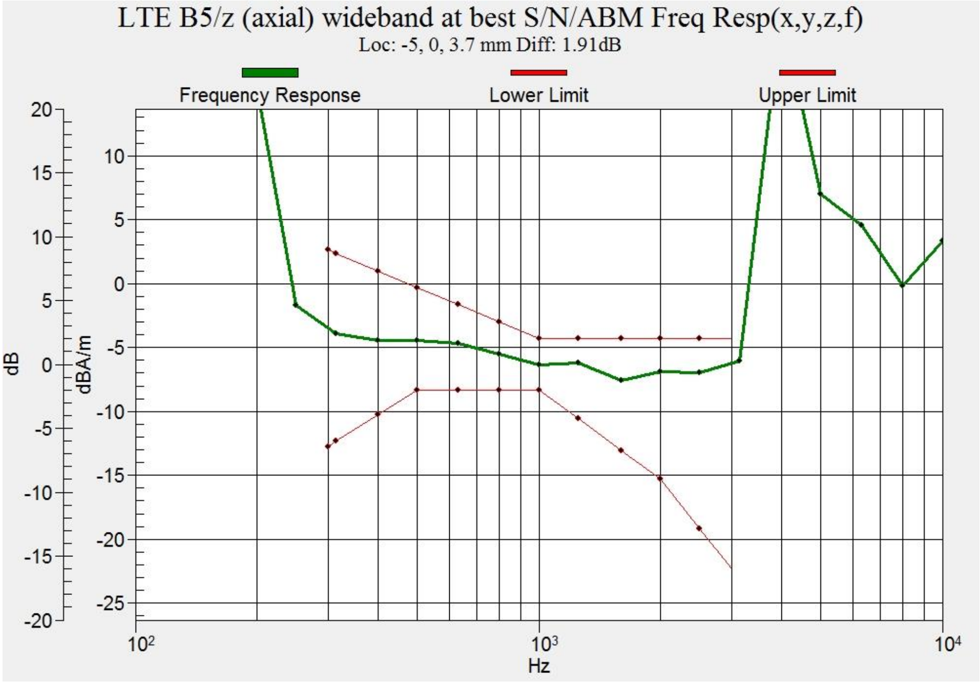

Figure B.30 Frequency Response of LTE B5

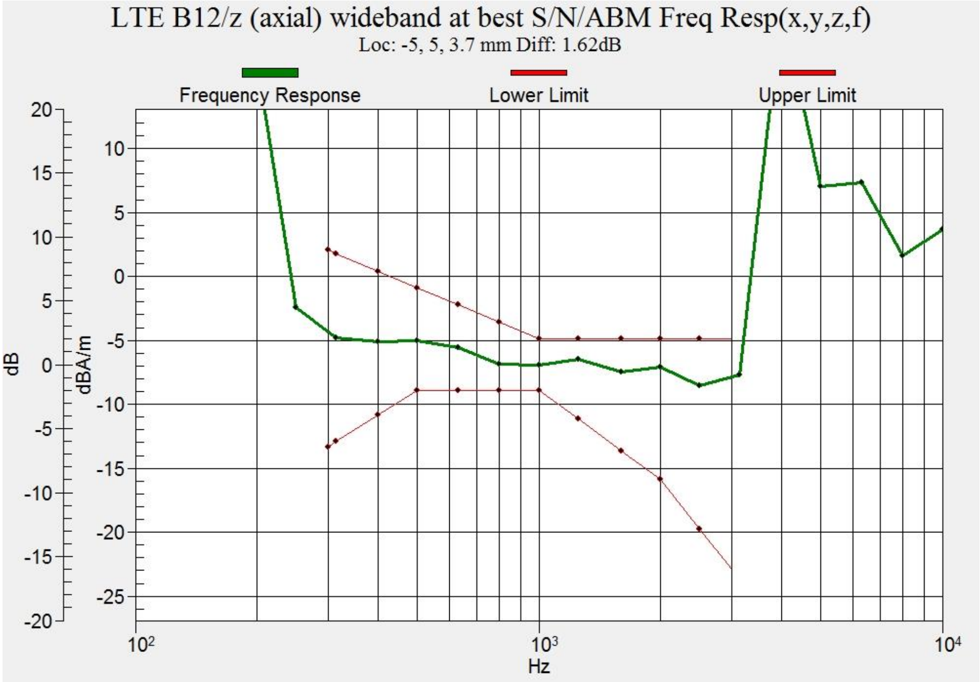

Figure B.31 Frequency Response of LTE B12

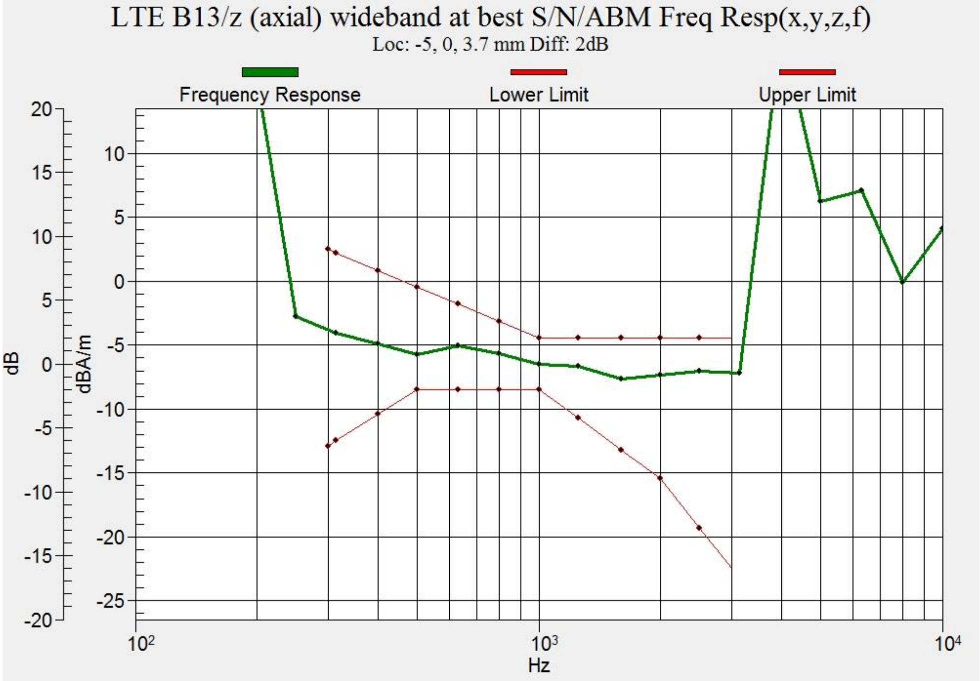

Figure B.32 Frequency Response of W LTE B13

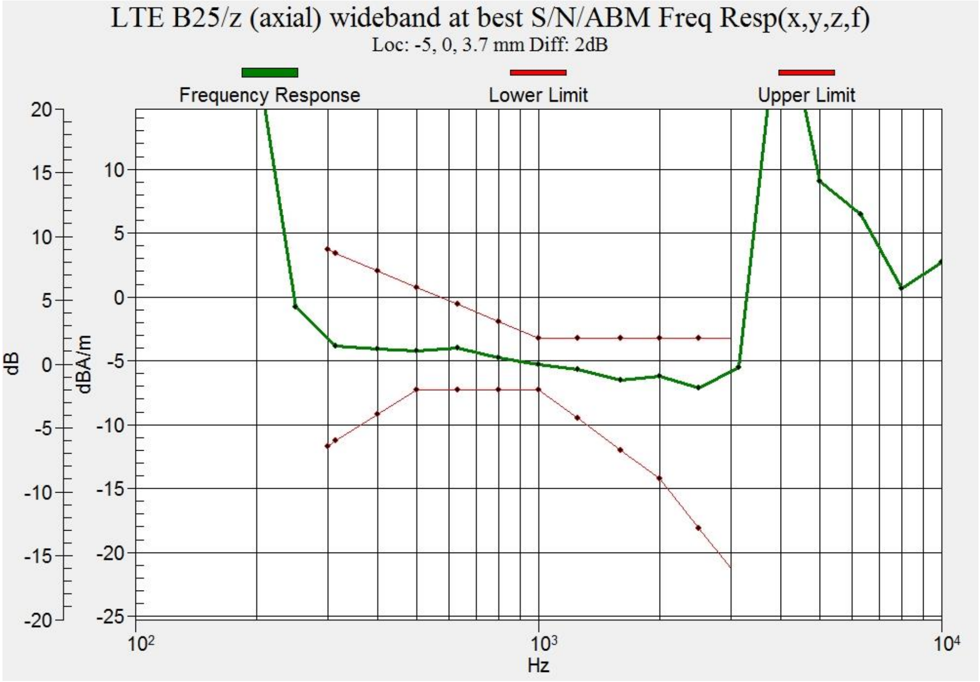

Figure B.33 Frequency Response of LTE B25

Figure B.34 Frequency Response of LTE B26

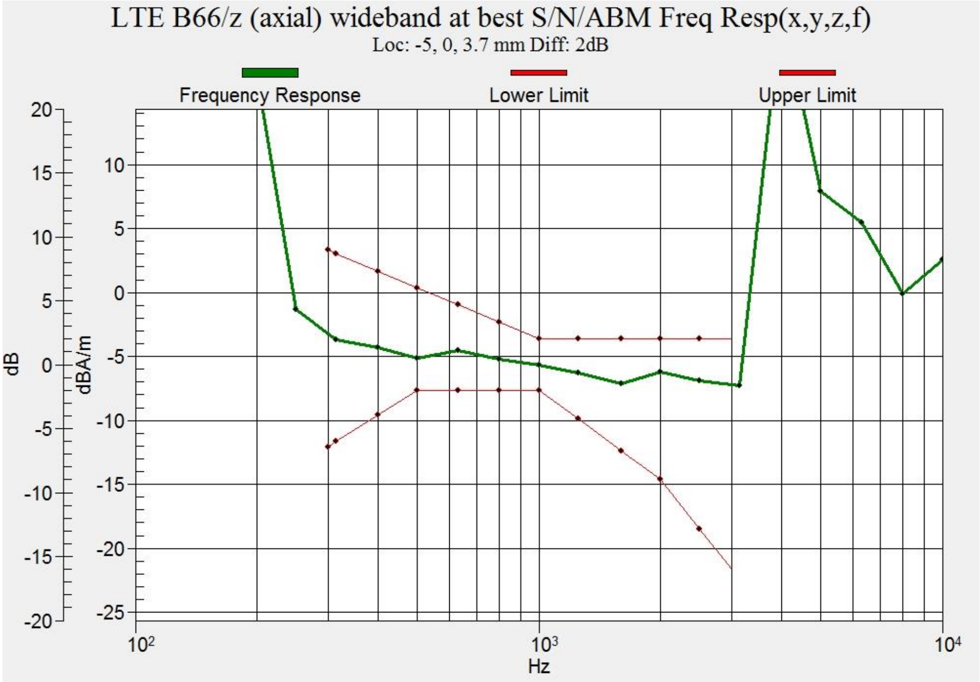

Figure B.35 Frequency Response of LTE B66

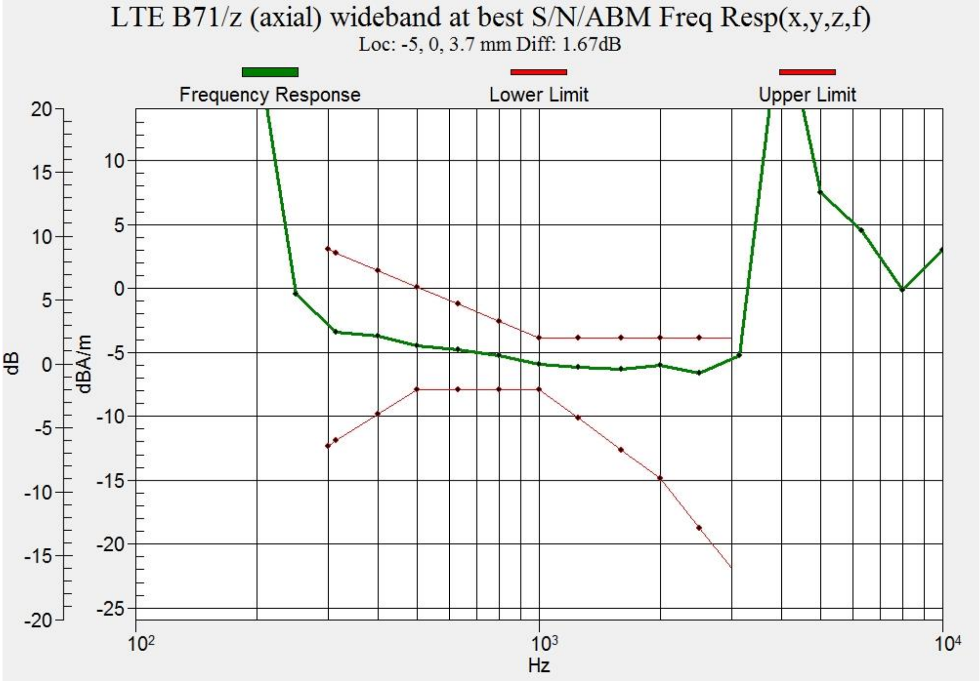

Figure B.36 Frequency Response of LTE B71

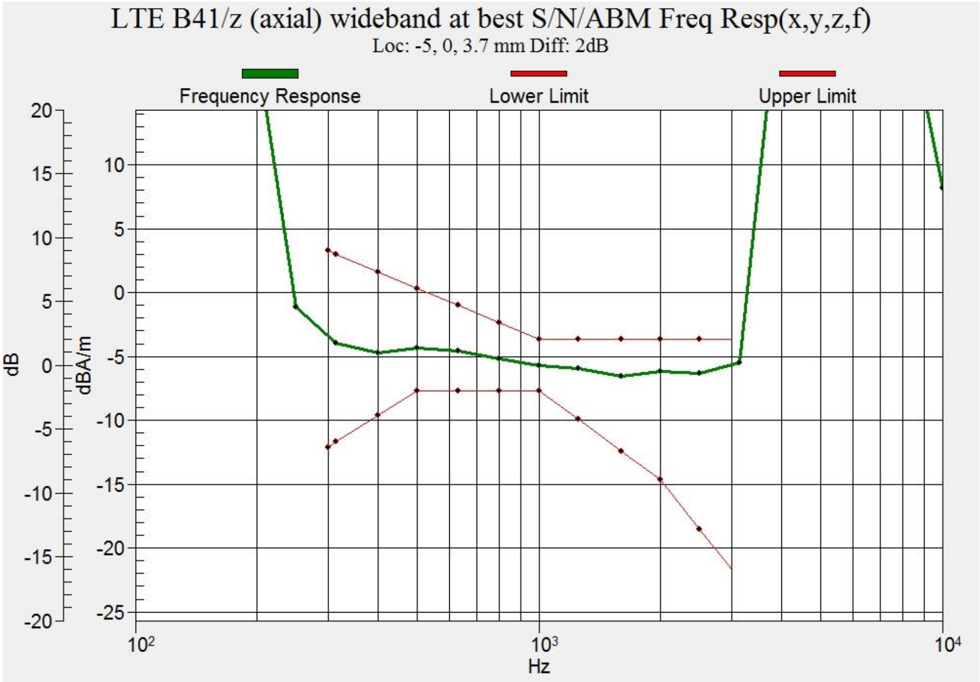

Figure B.37 Frequency Response of LTE B41

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
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 ± 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

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Manager	[signature]

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%.