

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

References

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

Methods Applied and Interpretation of Parameters:

- Coordinate System:** y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 15 mm above the top metal edge of the dipole arms.
- Measurement Conditions:** Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- Antenna Positioning:** The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections. It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- Feed Point Impedance and Return Loss:** These parameters are measured using a Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- E-field distribution:** E field is measured in the x-y-plane with an isotropic E-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 15 mm (in z) above the metal top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, in the plane above the dipole surface.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Phantom	HAC Test Arch	
Distance Dipole Top - Probe Center	15 mm	
Scan resolution	dx, dy = 5 mm	
Frequency	2600 MHz $\pm$ 1 MHz	
Input power drift	< 0.05 dB	

Maximum Field values at 2600 MHz

E-field 15 mm above dipole surface	condition	Interpolated maximum
Maximum measured above high end	100 mW input power	85.3 V/m = 38.62 dBV/m
Maximum measured above low end	100 mW input power	84.5 V/m = 38.53 dBV/m
Averaged maximum above arm	100 mW input power	84.9 V/m $\pm$ 12.8 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters

Frequency	Return Loss	Impedance
2450 MHz	24.3 dB	44.3 Ω + 1.0 j Ω
2550 MHz	22.1 dB	56.9 Ω + 4.7 j Ω
2600 MHz	20.0 dB	60.5 Ω - 3.5 j Ω
2650 MHz	19.1 dB	55.1 Ω - 10.5 j Ω
2750 MHz	15.7 dB	41.2 Ω - 12.2 j Ω

3.2 Antenna Design and Handling

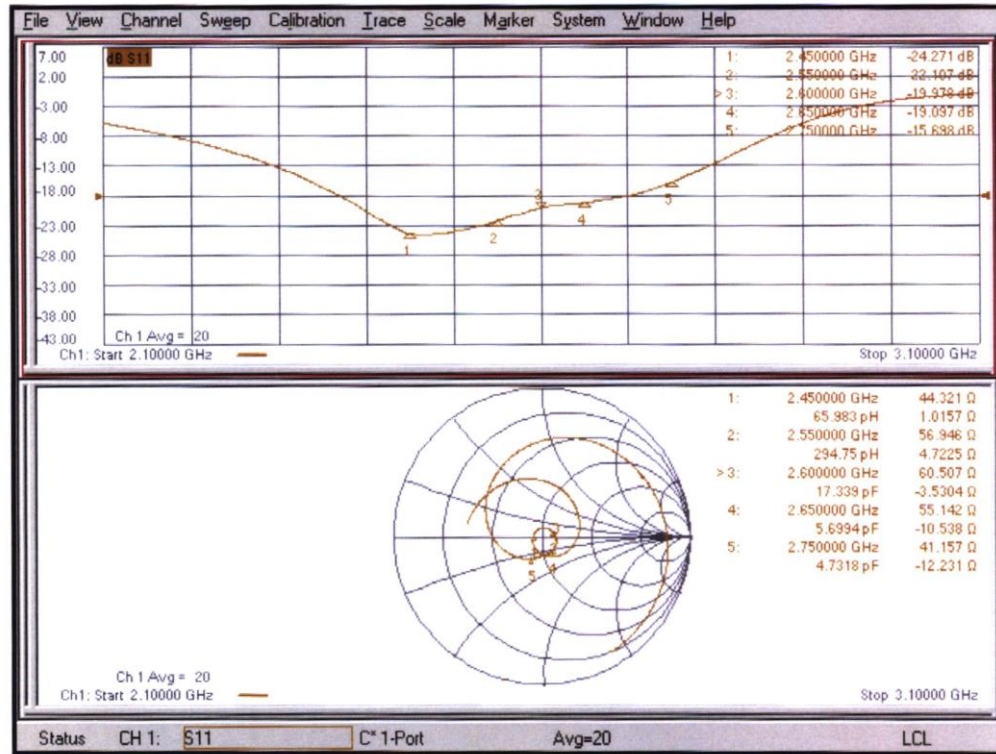
The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.

The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.

Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

Impedance Measurement Plot



DASY5 E-field Result

Date: 16.08.2024

Test Laboratory: SPEAG Lab2

DUT: HAC Dipole 2600 MHz; Type: CD2600V3; Serial: CD2600V3 - SN: 1017

Communication System: UID 0 - CW ; Frequency: 2600 MHz

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

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EF3DV3 - SN4013; ConvF(1, 1, 1) @ 2600 MHz; Calibrated: 28.12.2023
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 16.02.2024
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole E-Field measurement @ 2600MHz/E-Scan - 2600MHz d=15mm/Hearing Aid Compatibility Test (41x181x1):

Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 138.7 V/m; Power Drift = -0.00 dB

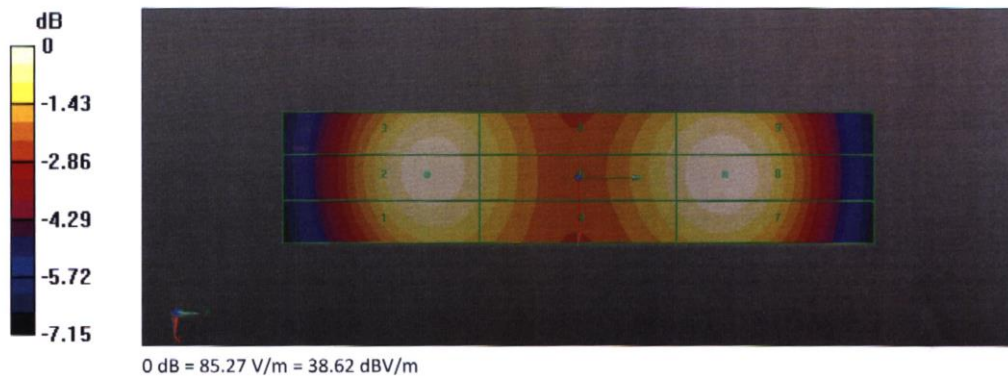
Applied MIF = 0.00 dB

RF audio interference level = 38.62 dBV/m

Emission category: M2

MIF scaled E-field

Grid 1 M2	Grid 2 M2	Grid 3 M2
38.25 dBV/m	38.53 dBV/m	38.42 dBV/m
Grid 4 M2	Grid 5 M2	Grid 6 M2
37.77 dBV/m	37.97 dBV/m	37.89 dBV/m
Grid 7 M2	Grid 8 M2	Grid 9 M2
38.37 dBV/m	38.62 dBV/m	38.5 dBV/m



Dipole 3500 MHz

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Client **CTTL**
Beijing

Certificate No. **CD3500V3-1008_Aug24**

CALIBRATION CERTIFICATE

Object **CD3500V3 - SN: 1008**

Calibration procedure(s) **QA CAL-20.v7**
Calibration Procedure for Validation Sources in air

Calibration date: **August 16, 2024**

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
Power meter NRP2	SN: 104778	26-Mar-24 (No. 217-04036/04037)	Mar-25
Power sensor NRP-Z91	SN: 103244	26-Mar-24 (No. 217-04036)	Mar-25
Power sensor NRP-Z91	SN: 103245	26-Mar-24 (No. 217-04037)	Mar-25
Reference 20 dB Attenuator	SN: BH9394 (20k)	26-Mar-24 (No. 217-04046)	Mar-25
Type-N mismatch combination	SN: 310982 / 06327	26-Mar-24 (No. 217-04047)	Mar-25
Probe EF3DV3	SN: 4013	28-Dec-23 (No. EF3-4013_Dec23)	Dec-24
DAE4	SN: 781	16-Feb-24 (No. DAE4-781_Feb24)	Feb-25
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Nov-23)	In house check: Nov-24
Power sensor HP E4412A	SN: US38485102	05-Jan-10 (in house check Nov-23)	In house check: Nov-24
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Nov-23)	In house check: Nov-24
RF generator R&S SMT-06	SN: 837633/005	10-Jan-19 (in house check Nov-23)	In house check: Nov-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

Calibrated by:	Name Leif Klysner	Function Laboratory Technician	Signature 
Approved by:	Sven Kühn	Technical Manager	

Issued: August 20, 2024

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

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

Methods Applied and Interpretation of Parameters:

- Coordinate System:** y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 15 mm above the top metal edge of the dipole arms.
- Measurement Conditions:** Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- Antenna Positioning:** The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections. It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- Feed Point Impedance and Return Loss:** These parameters are measured using a Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- E-field distribution:** E field is measured in the x-y-plane with an isotropic E-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 15 mm (in z) above the metal top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, in the plane above the dipole surface.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Phantom	HAC Test Arch	
Distance Dipole Top - Probe Center	15 mm	
Scan resolution	dx, dy = 5 mm	
Frequency	3500 MHz $\pm$ 1 MHz 3900 MHz $\pm$ 1 MHz	
Input power drift	< 0.05 dB	

Maximum Field values at 3500 MHz

E-field 15 mm above dipole surface	condition	Interpolated maximum
Maximum measured above high end	100 mW input power	85.7 V/m = 38.65 dBV/m
Maximum measured above low end	100 mW input power	84.3 V/m = 38.51 dBV/m
Averaged maximum above arm	100 mW input power	85.0 V/m $\pm$ 12.8 % (k=2)

Maximum Field values at 3900 MHz

E-field 15 mm above dipole surface	condition	Interpolated maximum
Maximum measured above high end	100 mW input power	81.8 V/m = 38.26 dBV/m
Maximum measured above low end	100 mW input power	80.7 V/m = 38.14 dBV/m
Averaged maximum above arm	100 mW input power	81.3 V/m $\pm$ 12.8 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters****Nominal Frequencies**

Frequency	Return Loss	Impedance
3300 MHz	18.3 dB	$63.2 \Omega + 3.9 j\Omega$
3400 MHz	22.7 dB	$55.4 \Omega - 5.5 j\Omega$
3500 MHz	24.3 dB	$51.9 \Omega - 5.9 j\Omega$
3600 MHz	22.1 dB	$47.0 \Omega - 7.0 j\Omega$
3700 MHz	20.5 dB	$41.6 \Omega - 2.1 j\Omega$

Additional Frequencies

Frequency	Return Loss	Impedance
3900 MHz	21.4 dB	$48.7 \Omega + 8.3 j\Omega$

3.2 Antenna Design and Handling

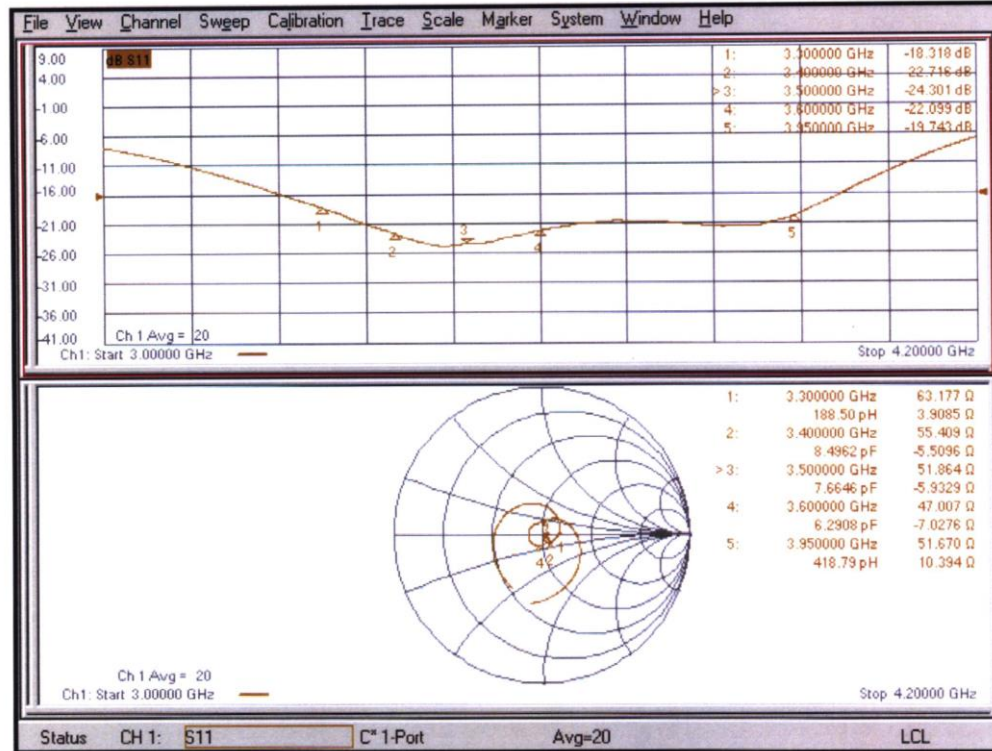
The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.

The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.

Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

Impedance Measurement Plot



DASY5 E-field Result

Date: 16.08.2024

Test Laboratory: SPEAG Lab2

DUT: HAC Dipole 3500 MHz; Type: CD3500V3; Serial: CD3500V3 - SN: 1008

Communication System: UID 0 - CW ; Frequency: 3500 MHz, Frequency: 3900 MHz

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

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EF3DV3 - SN4013; ConvF(1, 1, 1) @ 3500 MHz, ConvF(1, 1, 1) @ 3900 MHz; Calibrated: 28.12.2023
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 16.02.2024
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole E-Field measurement @ 3500MHz/E-Scan - 3500MHz d=15mm/Hearing Aid Compatibility Test (41x121x1):

Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 150.7 V/m; Power Drift = 0.00 dB

Applied MIF = 0.00 dB

RF audio interference level = 38.65 dBV/m

Emission category: M2

MIF scaled E-field

Grid 1 M2 38.32 dBV/m	Grid 2 M2 38.51 dBV/m	Grid 3 M2 38.43 dBV/m
Grid 4 M2 38.28 dBV/m	Grid 5 M2 38.37 dBV/m	Grid 6 M2 38.23 dBV/m
Grid 7 M2 38.5 dBV/m	Grid 8 M2 38.65 dBV/m	Grid 9 M2 38.47 dBV/m

Dipole E-Field measurement @ 3500MHz/E-Scan - 3900MHz, d=15mm/Hearing Aid Compatibility Test (41x121x1):

Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 135.3 V/m; Power Drift = 0.01 dB

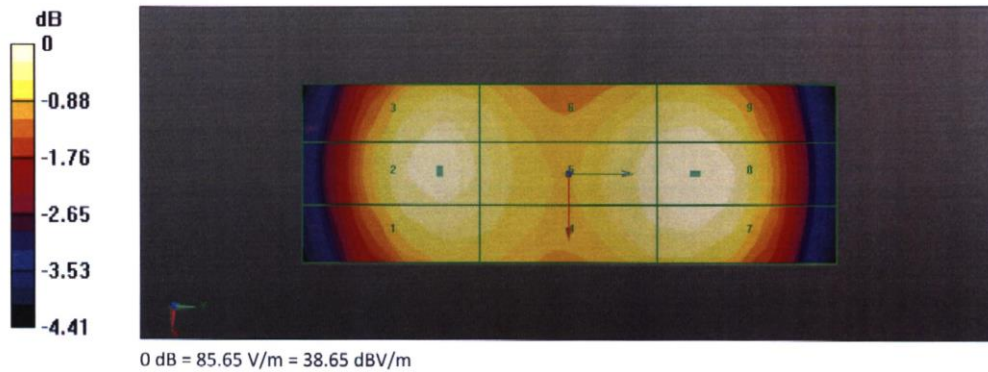
Applied MIF = 0.00 dB

RF audio interference level = 38.26 dBV/m

Emission category: M2

MIF scaled E-field

Grid 1 M2	Grid 2 M2	Grid 3 M2
37.97 dBV/m	38.14 dBV/m	38.08 dBV/m
Grid 4 M2	Grid 5 M2	Grid 6 M2
38.07 dBV/m	38.12 dBV/m	38.01 dBV/m
Grid 7 M2	Grid 8 M2	Grid 9 M2
38.15 dBV/m	38.26 dBV/m	38.09 dBV/m



ANNEX F THE EVALUATION OF SPOTCHECK

F.1 The results for spot check

Bands	Frequency (MHz)	Channel	RFail (dBV/m)	Compliance
GSM 850	836.6	190	36.92	PASS(see Fig B.1)
GSM 1900	1850.2	512	22.80	PASS(see Fig B.2)
LTE Band41	2593	40620	23.12	PASS(see Fig B.3)
NR n41 ANT1	2592.990	518598	23.67	PASS(see Fig B.4)
NR n41 ANT4	2640	528000	34.31	PASS(see Fig B.5)
NR n77 ANT2	3540.000	636000	32.62	PASS(see Fig B.6)

F.2 Validation Result

E-Field Scan						
Mode	Frequency (MHz)	Input Power (mW)	Measured ¹ Value(V/m)	Target ² Value(V/m)	Deviation ³ (%)	Limit ⁴ (%)
CW	835	100	117.00	112.60	3.91	± 18
CW	1880	100	88.00	88.20	-0.23	± 18
CW	2600	100	88.4	85.30	3.63	± 18
CW	3500	100	81.1	85.70	-6.42	± 18

F.3 Test Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Signal Generator	E4483C	MY49070393	May 31, 2024	One Year
02	Power meter	NRP2	106276	May 17, 2024	One year
03	Power sensor	NRP6A	101369		
04	Amplifier	60S1G4	0331848	No Calibration Requested	
05	E-Field Probe	EF3DV3	4060	May 23, 2024	One year
06	DAE	SPEAG DAE4	1524	October 18, 2024	One year
07	HAC Dipole	CD835V3	1023	August 16, 2024	One year
08	HAC Dipole	CD1880V3	1018	August 16, 2024	One year
09	HAC Dipole	CD2600V3	1017	August 16, 2024	One year
10	HAC Dipole	CD3500V3	1008	August 16, 2024	One year
11	BTS	CMW500	166370	July 4, 2024	One year
12	BTS	CMX500	102152	Apr 17,2024	One year
13	MAIA	SE UMS 171 DB	1554	No Calibration Requested	

F.4 Test plots of spot check

Device Under Test

Manufacturer	Model	Dimensions[mm]	Speaker Position [mm]
1	1	146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
GSM 850	GSM-FDD (TDMA, GMSK)	190	836.6

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
50.0	50.0	10.0	10.0	15.0

Results

E _{max} [dB(V/m)]	E _{avg50x50 max} [dB(V/m)]	MIF [dB]	R _{Fail} [dB(V/m)]
38.06	33.29	3.63	36.92

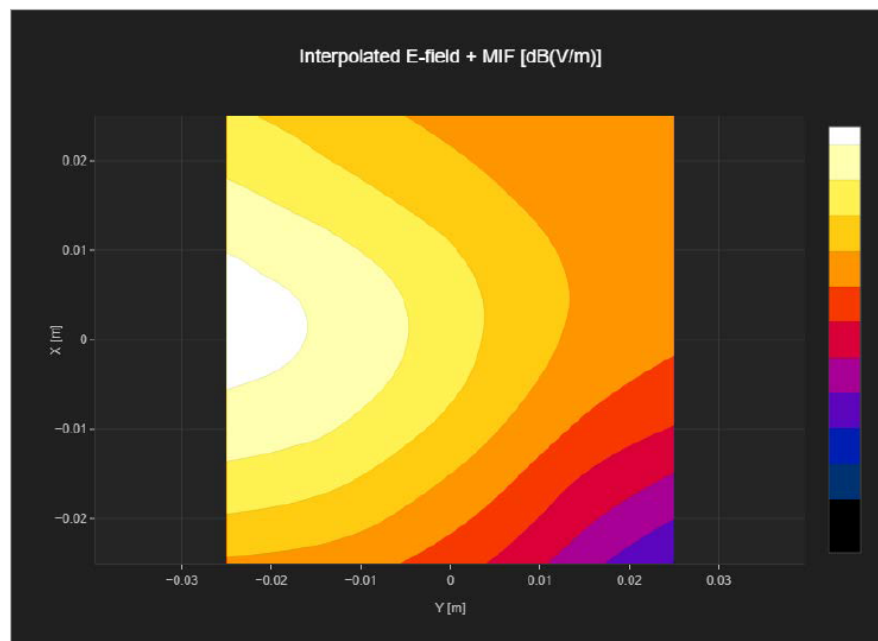


Fig B.1 GSM 850

Device Under Test

Manufacturer	Model	Dimensions[mm]	Speaker Position [mm]
1	1	146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
PCS 1900	GSM-FDD (TDMA, GMSK)	512	1850.2

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
50.0	50.0	10.0	10.0	15.0

Results

E _{max} [dB(V/m)]	E _{avg50x50 max} [dB(V/m)]	MIF [dB]	R _{Fail} [dB(V/m)]
26.06	19.17	3.63	22.8

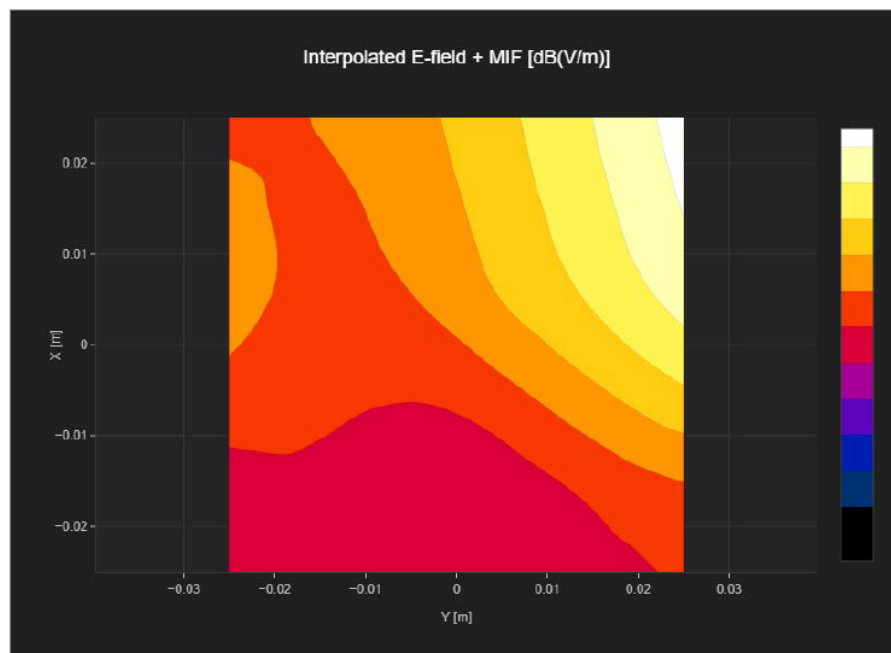


Fig B.2 GSM 1900

Device Under Test

Manufacturer	Model	Dimensions[mm]	Speaker Position [mm]
1	1	146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
Band 41, E-UTRA/TDD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	40620	2593.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
50.0	50.0	10.0	10.0	15.0

Results

E _{max} [dB(V/m)]	E _{avg50x50 max} [dB(V/m)]	MIF [dB]	R _{Fail} [dB(V/m)]
29.86	24.74	-1.62	23.12

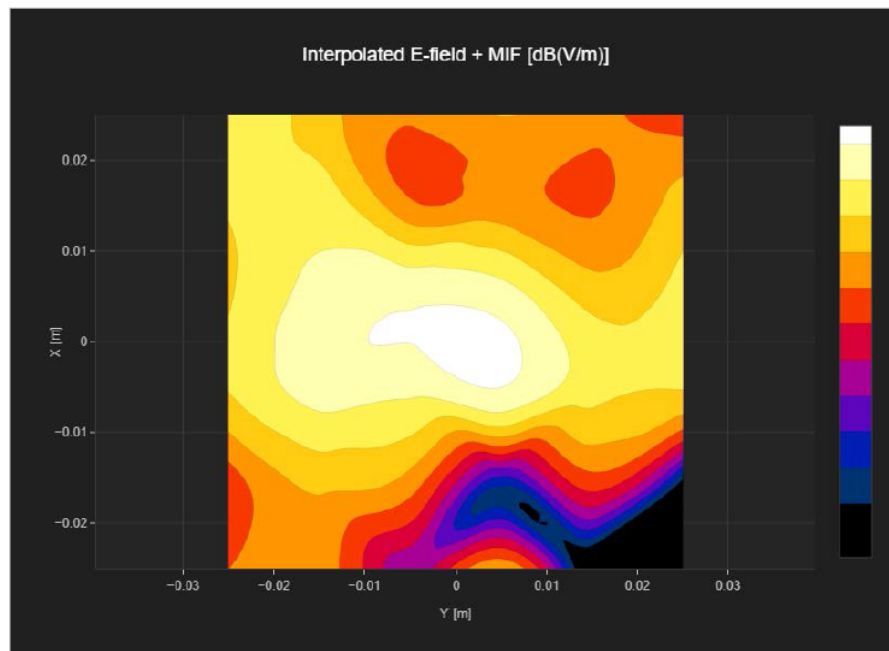


Fig B.3 LTE B41 PC2

Device Under Test

Manufacturer	Model	Dimensions[mm]	Speaker Position [mm]
1	1	146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
Band n41	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	518598	2592.99

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
50.0	50.0	10.0	10.0	15.0

Results

E _{max} [dB(V/m)]	E _{avg50x50 max} [dB(V/m)]	MIF [dB]	R _{Fail} [dB(V/m)]
29.84	25.31	-1.64	23.67

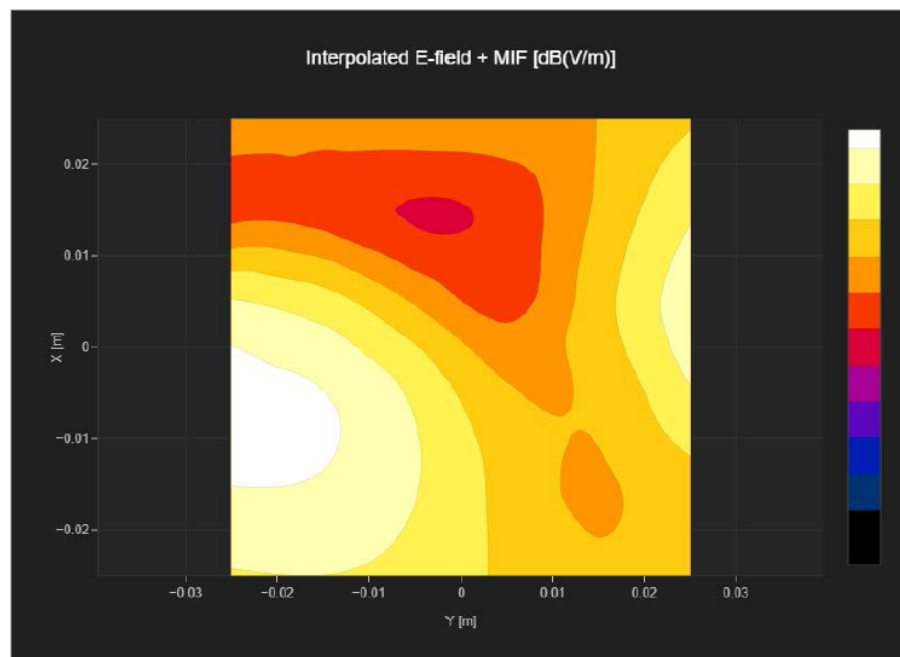


Fig B.4 NR n41 ANT1

Device Under Test

Manufacturer	Model	Dimensions[mm]	Speaker Position [mm]
1	1	146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
Band n41	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	528000	2640.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
50.0	50.0	10.0	10.0	15.0

Results

E _{max} [dB(V/m)]	E _{avg50x50 max} [dB(V/m)]	MIF [dB]	R _{Fail} [dB(V/m)]
38.49	35.95	-1.64	34.31

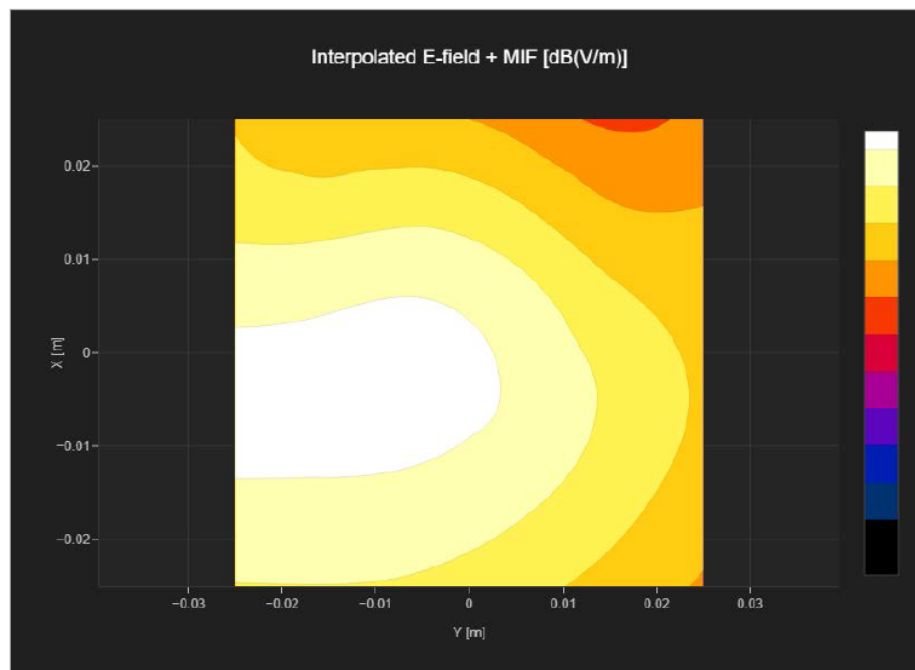


Fig B.5 NR n41 ANT4

Device Under Test

Manufacturer	Model	Dimensions[mm]	Speaker Position [mm]
1	1	146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
Band n77	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	636000	3540.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
50.0	50.0	10.0	10.0	15.0

Results

E _{max} [dB(V/m)]	E _{avg50x50 max} [dB(V/m)]	MIF [dB]	R _{Fail} [dB(V/m)]
37.58	34.26	-1.64	32.62

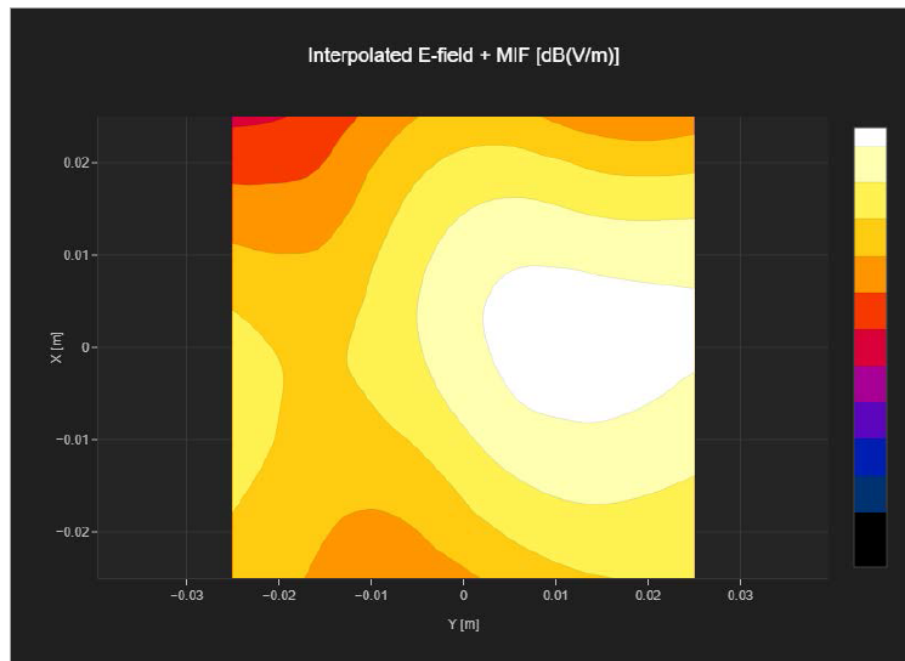


Fig B.6 NR n77 ANT2

F.5 System validation

E SCAN of Dipole 835 MHz

Device Under Test

Manufacturer	Model	Dimensions [mm]	Speaker Position [mm]
		146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

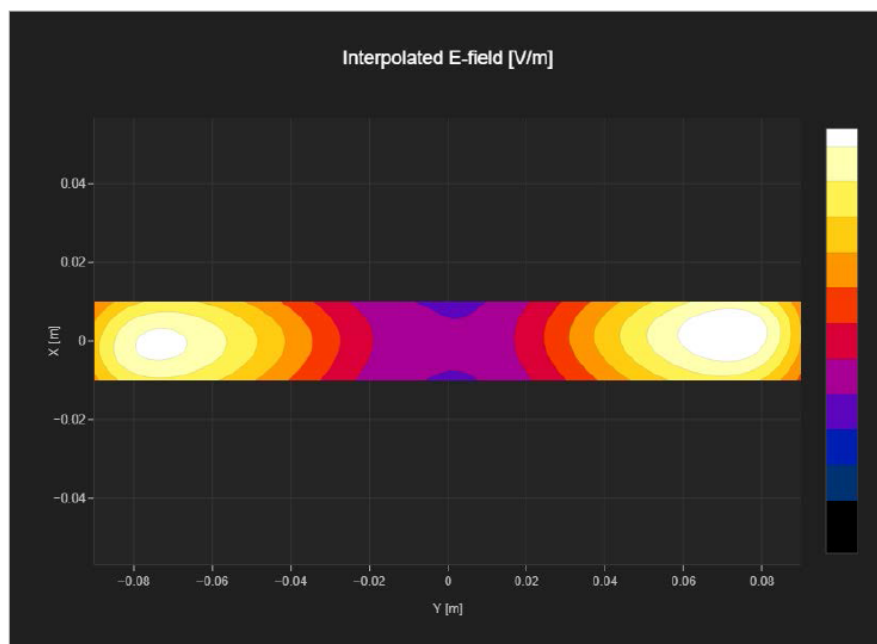
Band Name	Communication Systems Name	Channel	Frequency [MHz]
CD835	CW	50	835.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
20.0	180.0	5.0	5.0	15.0

Results

Dipole Type	Dipole Serial Number	E _{max} [V/m]	Drift [dB]
CD835	XXXX	117	-0.03



E SCAN of Dipole 1880 MHz

Device Under Test

Manufacturer	Model	Dimensions [mm]	Speaker Position [mm]
		146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

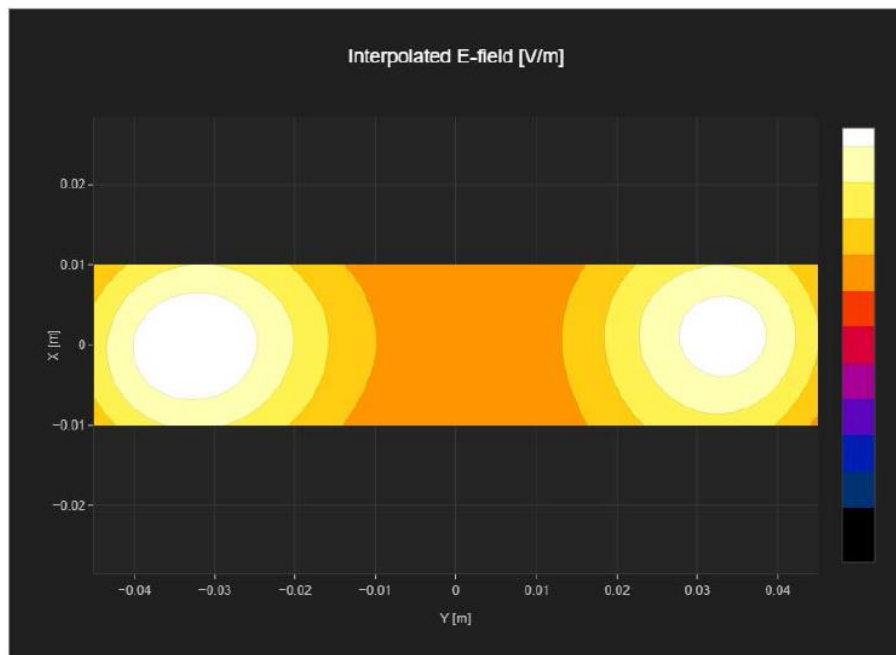
Band Name	Communication Systems Name	Channel	Frequency [MHz]
CD1880	CW	0	1730.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
20.0	90.0	5.0	5.0	15.0

Results

Dipole Type	Dipole Serial Number	E _{max} [V/m]	Drift [dB]
CD1880	XXXX	88.0	0.01



E SCAN of Dipole 2600 MHz

Device Under Test

Manufacturer	Model	Dimensions [mm]	Speaker Position [mm]
		146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

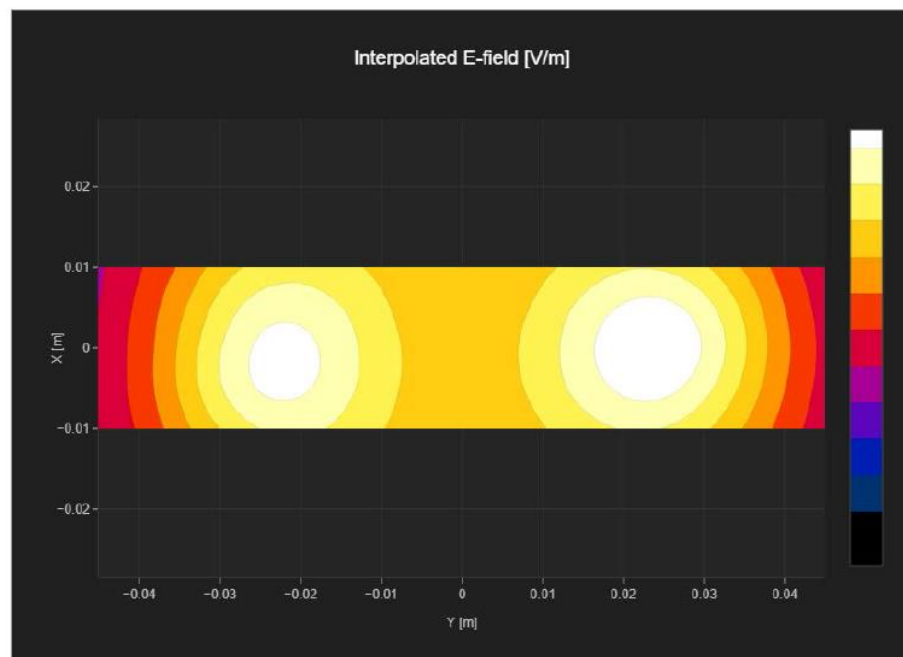
Band Name	Communication Systems Name	Channel	Frequency [MHz]
CD2600V3	CW	50	2600.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
20.0	90.0	5.0	5.0	15.0

Results

Dipole Type	Dipole Serial Number	E _{max} [V/m]	Drift [dB]
CD2600	XXXX	88.4	0.0



E SCAN of Dipole 3500 MHz

Device Under Test

Manufacturer	Model	Dimensions [mm]	Speaker Position [mm]
		146.2 x 71.8 x 7.5	144.3

Hardware Setup

Probe Name	Probe Calibration Date	DAE Name	DAE Calibration Date
EF3DV3 - SN4060	May 23, 2024	DAE4 Sn1524	October 18, 2024

Communication Systems

Band Name	Communication Systems Name	Channel	Frequency [MHz]
CD3500V3	CW	50	3500.0

Grid Settings

Extent X [mm]	Extent Y [mm]	Step X [mm]	Step Y [mm]	Distance [mm]
20.0	60.0	5.0	5.0	15.0

Results

Dipole Type	Dipole Serial Number	E _{max} [V/m]	Drift [dB]
CD3500	XXXX	81.1	-0.01

