Appendix B: Nominal parameters of reference materials used for calibration (additional assessments outside the scope of SCS0108)

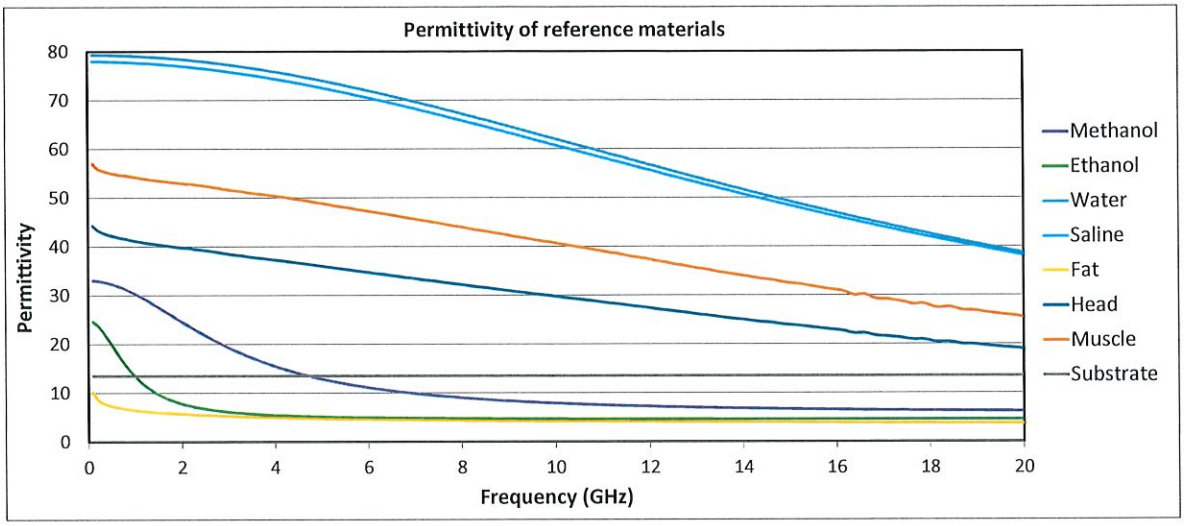


Fig. B.1 Permittivity of reference materials

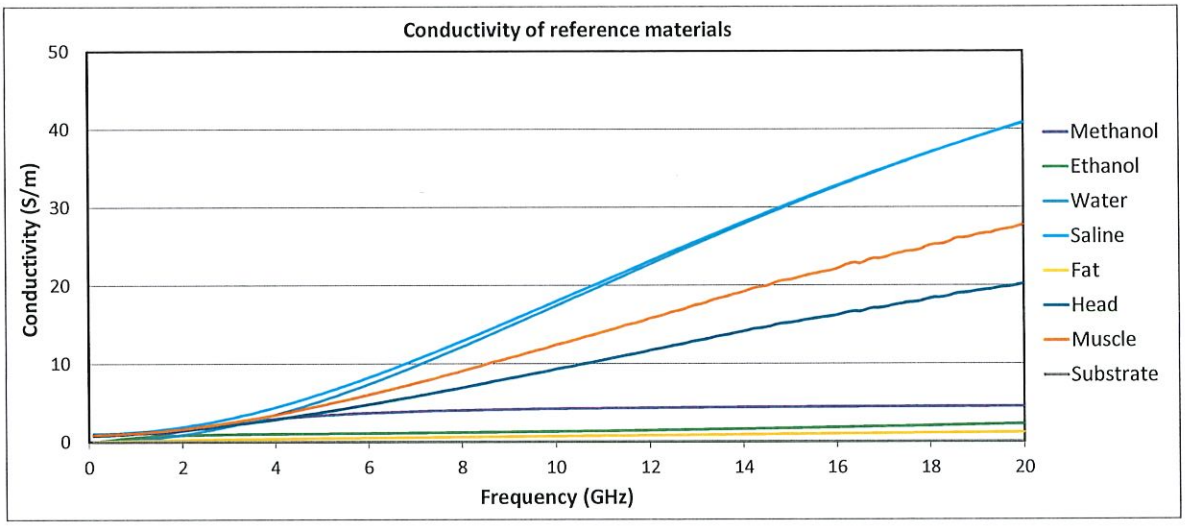


Fig. B.2 Conductivity of reference materials

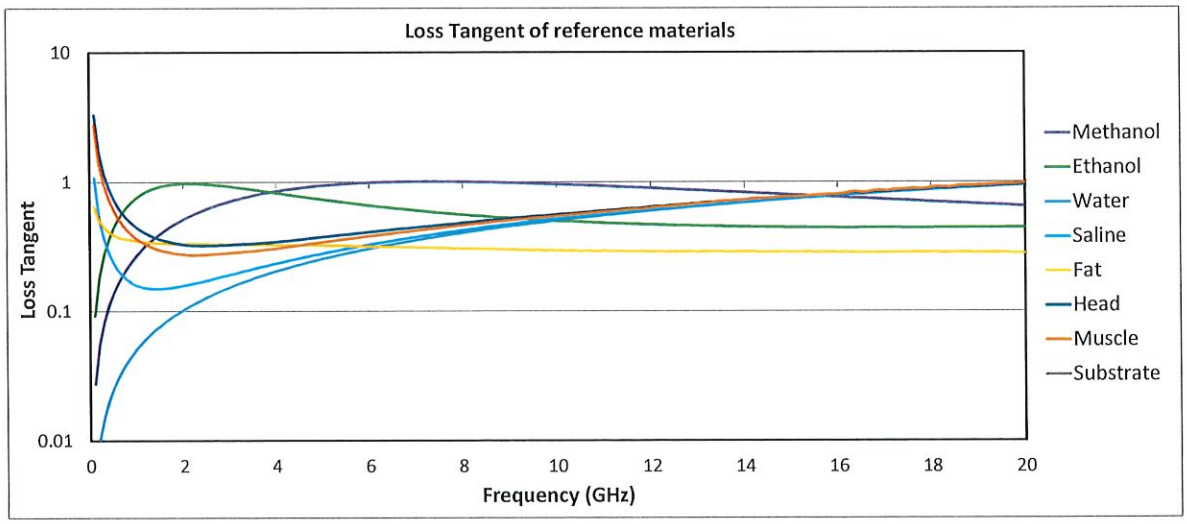


Fig. B.3 Loss tangent of reference materials

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 **WSCT**
Shenzhen

Certificate No. **MAGPy-8H3D-3087_Nov24**

CALIBRATION CERTIFICATE

Object	MAGPy-8H3D+E3DV2 SN:3087 MAGPy-DASV2 SN:3116
Calibration procedure(s)	QA CAL-46.v1 Calibration Procedure for MAGPy–8H3D+E3D Near-field Electric and Magnetic Field Sensor System
Calibration date	November 01, 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Oscilloscope	SN: 110918	03-Sep-24 (No. 4030A315008835)	Sep-25
Reference 20 dB Attenuator	SN: CC2552 (20x)	26-Mar-24 (No. 217-04046)	Mar-25
Type-N mismatch	SN: 310982 / 06327	26-Mar-24 (No. 217-04047)	Mar-25

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Network Analyzer E5061B	SN: MY49810822	In house check: Nov-23	In house check: Nov-24
TEM Cell	SN: S6029i	In house check: Nov-23	In house check: Nov-24
Plate Capacitor	SN: 6028i	In house check: Nov-23	In house check: Nov-24
Resonator (160kHz)	SN: 6030i	In house check: Nov-23	In house check: Nov-24

	Name	Function	Signature
Calibrated by	Aidonia Georgiadou	Laboratory Engineer	
Approved by	Sven Kühn	Technical Manager	

Issued: November 01, 2024

Glossary

MAGPy-8H3D-E3D	Magnetic Amplitude and Gradient Probe – Eight H-field Sensors, Single E-field sensor
MAGPy-DAS	Magnetic Amplitude and Gradient Data Acquisition System

Calibration is Performed According to the Following Standards:

a) IEEE Std 1309-2013, "IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", November 2013

Methods Applied and Interpretation of Parameters

- Calibration has been performed after the adjustment of the device.
- *Linearity*: Calibration of the linearity of the field reading over the specified dynamic range at 161.75 kHz. Influence of offset voltage is included in this measurement.
- *Frequency response*: Calibration of the field reading over the specified frequency range from 3.0 kHz to 10.0 MHz.
- Receiving Pattern: Assessed for H-field polarizations ϑ, and $\phi = 0° ... 360°$; $\vartheta = 90°$, and $\phi = 0° ... 360°$; for the XYZ sensors (in TEM-Cell at 4 kHz, 40 kHz, 400 kHz and 4 MHz).
- Receiving Pattern: Assessed for E-field polarizations ϑ, and $\phi = 0° ... 360°$; $\vartheta = 90°$, and $\phi = 0° ... 360°$; for the XYZ sensor (in parallel plate capacitor at 4 kHz, 40 kHz, 400 kHz and 4 MHz).

Calibration Uncertainty

The calibration uncertainty is 0.7 dB for the H-field readings and 1.06 dB for the E-field readings. The calibration uncertainty is specified over the frequency range from 3.0 kHz to 10.0 MHz and a dynamic range from 0.1 A/m to 3200 A/m and from 0.08 V/m to 2000 V/m respectively.

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

Unit Type	MAGPy–8H3D+E3DV2 (SP MGY 303 AA)	3087
	MAGPy–DASV2 (SE UMS 303 AF)	3116
	MAGPy FPGA Board	WP000270
Adjustment Date	Last MAGPy Adjustment	November 01, 2024
Firmware SW Version	MAGPy Firmware	Ver. 1.00
Backend SW Version	MAGPy Backend	Ver. 1.0.2
Calibration SW Version	MAGACAP	Ver. 1.0

Dynamic Range

Dynamic Range, H-field, Channel 0

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.390	0.370	0.370	0.400	0.380	0.380	0.22	0.23	0.23	±1.00
0.520	0.510	0.500	0.530	0.510	0.520	0.17	0.00	0.34	±1.00
0.720	0.700	0.690	0.710	0.700	0.700	−0.12	0.00	0.12	±1.00
0.940	0.910	0.900	0.940	0.910	0.900	0.00	0.00	0.00	±1.00
1.28	1.24	1.22	1.28	1.25	1.20	0.00	0.07	−0.14	±1.00
1.75	1.70	1.67	1.75	1.69	1.66	0.00	−0.05	−0.05	±1.00
2.33	2.26	2.23	2.32	2.27	2.22	−0.04	0.04	−0.04	±0.20
3.12	3.02	2.97	3.11	3.03	2.95	−0.03	0.03	−0.06	±0.20
4.23	4.10	4.03	4.23	4.12	4.03	0.00	0.04	0.00	±0.20
5.73	5.55	5.46	5.72	5.60	5.46	−0.02	0.08	0.00	±0.20
7.69	7.46	7.34	7.69	7.53	7.34	0.00	0.08	0.00	±0.20
10.3	9.96	9.79	10.3	10.0	9.81	0.00	0.03	0.02	±0.20
13.9	13.5	13.2	13.8	13.5	13.2	−0.06	0.00	0.00	±0.20
18.7	18.2	17.8	18.7	18.2	17.9	0.00	0.00	0.05	±0.20
25.3	24.5	24.1	25.3	24.6	24.1	0.00	0.04	0.00	±0.20
33.8	32.8	32.2	33.9	32.9	32.4	0.03	0.03	0.05	±0.20
45.6	44.3	43.5	45.9	44.5	43.7	0.06	0.04	0.04	±0.20
62.0	60.1	59.0	62.2	60.3	59.3	0.03	0.03	0.04	±0.20
85.1	82.5	81.1	84.9	82.2	80.7	−0.02	−0.03	−0.04	±0.20
111	108	106	111	108	106	0.00	0.00	0.00	±0.20
153	148	146	153	148	145	0.00	0.00	−0.06	±0.20
212	206	202	212	205	202	0.00	−0.04	0.00	±0.20
294	285	280	296	280	274	0.06	−0.15	−0.19	±0.20
434	420	412	429	414	406	−0.10	−0.12	−0.13	±0.20
599	579	567	596	575	563	−0.04	−0.06	−0.06	±0.20
894	864	845	899	867	848	0.05	0.03	0.03	±0.20
1350	1310	1280	1380	1330	1300	0.19	0.13	0.13	±0.30
1840	1780	1740	1900	1830	1780	0.28	0.24	0.20	±0.30
3030	2920	2850	3150	3030	2950	0.34	0.32	0.30	±0.50
3690	3540	3450	3850	3700	3600	0.37	0.38	0.37	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0 dB for applied H-fields < 2.0 A/m
- ±0.2 dB for applied H-fields ≥ 2.0 A/m and < 1000 A/m
- ±0.3 dB for applied H-fields ≥ 1000 A/m and < 2000 A/m
- ±0.4 dB for applied H-fields ≥ 2000 A/m and < 3000 A/m
- ±0.5 dB for applied H-fields ≥ 3000 A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 1

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.390	0.380	0.380	0.400	0.400	0.390	0.22	0.45	0.23	±1.00
0.530	0.520	0.520	0.530	0.540	0.510	0.00	0.33	−0.17	±1.00
0.730	0.710	0.710	0.730	0.710	0.700	0.00	0.00	−0.12	±1.00
0.950	0.930	0.930	0.950	0.920	0.930	0.00	−0.09	0.00	±1.00
1.29	1.26	1.26	1.28	1.26	1.25	−0.07	0.00	−0.07	±1.00
1.76	1.72	1.73	1.79	1.71	1.72	0.15	−0.05	−0.05	±1.00
2.35	2.30	2.30	2.37	2.30	2.29	0.07	0.00	−0.04	±0.20
3.14	3.07	3.07	3.17	3.07	3.06	0.08	0.00	−0.03	±0.20
4.26	4.16	4.17	4.28	4.17	4.17	0.04	0.02	0.00	±0.20
5.77	5.64	5.64	5.78	5.64	5.65	0.02	0.00	0.02	±0.20
7.75	7.58	7.59	7.77	7.59	7.59	0.02	0.01	0.00	±0.20
10.4	10.1	10.1	10.4	10.1	10.2	0.00	0.00	0.09	±0.20
14.0	13.7	13.7	14.0	13.7	13.7	0.00	0.00	0.00	±0.20
18.9	18.4	18.4	18.9	18.5	18.5	0.00	0.05	0.05	±0.20
25.5	24.9	24.9	25.5	24.9	25.0	0.00	0.00	0.03	±0.20
34.1	33.3	33.3	34.2	33.5	33.5	0.03	0.05	0.05	±0.20
46.0	45.0	45.0	46.2	45.2	45.2	0.04	0.04	0.04	±0.20
62.5	61.0	61.0	62.7	61.3	61.3	0.03	0.04	0.04	±0.20
85.8	83.8	83.9	85.5	83.5	83.5	−0.03	−0.03	−0.04	±0.20
112	110	110	112	109	109	0.00	−0.08	−0.08	±0.20
154	151	151	154	150	150	0.00	−0.06	−0.06	±0.20
214	209	209	214	209	208	0.00	0.00	−0.04	±0.20
296	290	289	298	284	284	0.06	−0.18	−0.15	±0.20
438	427	426	432	421	421	−0.12	−0.12	−0.10	±0.20
603	588	587	600	584	583	−0.04	−0.06	−0.06	±0.20
901	877	874	905	879	878	0.04	0.02	0.04	±0.20
1360	1330	1320	1390	1350	1340	0.19	0.13	0.13	±0.30
1860	1800	1790	1910	1850	1850	0.23	0.24	0.29	±0.30
3050	2960	2940	3170	3070	3060	0.34	0.32	0.35	±0.50
3720	3600	3570	3880	3750	3730	0.37	0.35	0.38	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 2

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.380	0.380	0.380	0.400	0.400	0.400	0.45	0.45	0.45	±1.00
0.520	0.510	0.520	0.530	0.530	0.550	0.17	0.33	0.49	±1.00
0.710	0.710	0.710	0.690	0.710	0.730	−0.25	0.00	0.24	±1.00
0.930	0.920	0.930	0.920	0.910	0.930	−0.09	−0.09	0.00	±1.00
1.26	1.25	1.26	1.26	1.24	1.26	0.00	−0.07	0.00	±1.00
1.72	1.71	1.72	1.72	1.72	1.74	0.00	0.05	0.10	±1.00
2.30	2.29	2.30	2.30	2.27	2.31	0.00	−0.08	0.04	±0.20
3.07	3.05	3.07	3.08	3.04	3.08	0.03	−0.03	0.03	±0.20
4.16	4.14	4.17	4.19	4.16	4.18	0.06	0.04	0.02	±0.20
5.64	5.61	5.63	5.64	5.61	5.67	0.00	0.00	0.06	±0.20
7.57	7.54	7.58	7.58	7.55	7.62	0.01	0.01	0.05	±0.20
10.1	10.1	10.1	10.1	10.1	10.2	0.00	0.00	0.09	±0.20
13.7	13.6	13.7	13.7	13.6	13.7	0.00	0.00	0.00	±0.20
18.4	18.3	18.4	18.4	18.4	18.4	0.00	0.05	0.00	±0.20
24.9	24.8	24.9	24.9	24.8	24.9	0.00	0.00	0.00	±0.20
33.3	33.1	33.2	33.4	33.2	33.4	0.03	0.03	0.05	±0.20
44.9	44.7	44.9	45.2	45.0	45.1	0.06	0.06	0.04	±0.20
61.0	60.7	61.0	61.2	60.9	61.3	0.03	0.03	0.04	±0.20
83.8	83.4	83.8	83.5	83.1	83.4	−0.03	−0.03	−0.04	±0.20
110	109	110	109	109	109	−0.08	0.00	−0.08	±0.20
151	150	151	150	149	150	−0.06	−0.06	−0.06	±0.20
209	208	209	209	207	208	0.00	−0.04	−0.04	±0.20
290	288	289	291	283	283	0.03	−0.15	−0.18	±0.20
428	425	426	422	419	420	−0.12	−0.12	−0.12	±0.20
589	585	586	586	582	583	−0.04	−0.04	−0.04	±0.20
880	873	873	884	876	877	0.04	0.03	0.04	±0.20
1330	1320	1320	1350	1340	1340	0.13	0.13	0.13	±0.30
1810	1790	1790	1860	1840	1840	0.24	0.24	0.24	±0.30
2980	2950	2940	3100	3060	3050	0.34	0.32	0.32	±0.40
3630	3580	3570	3790	3740	3720	0.37	0.38	0.36	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 3

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.380	0.380	0.380	0.420	0.400	0.350	0.87	0.45	−0.71	±1.00
0.520	0.510	0.510	0.550	0.540	0.500	0.49	0.50	−0.17	±1.00
0.710	0.710	0.710	0.730	0.720	0.700	0.24	0.12	−0.12	±1.00
0.930	0.920	0.920	0.950	0.920	0.930	0.18	0.00	0.09	±1.00
1.26	1.25	1.25	1.29	1.25	1.25	0.20	0.00	0.00	±1.00
1.72	1.71	1.71	1.75	1.73	1.70	0.15	0.10	−0.05	±1.00
2.30	2.28	2.28	2.31	2.29	2.28	0.04	0.04	0.00	±0.20
3.07	3.05	3.05	3.08	3.06	3.04	0.03	0.03	−0.03	±0.20
4.16	4.13	4.14	4.17	4.14	4.14	0.02	0.02	0.00	±0.20
5.64	5.60	5.60	5.65	5.61	5.60	0.02	0.02	0.00	±0.20
7.57	7.52	7.53	7.58	7.55	7.53	0.01	0.03	0.00	±0.20
10.1	10.0	10.0	10.1	10.1	10.1	0.00	0.09	0.09	±0.20
13.7	13.6	13.6	13.7	13.6	13.6	0.00	0.00	0.00	±0.20
18.4	18.3	18.3	18.4	18.3	18.4	0.00	0.00	0.05	±0.20
24.9	24.7	24.7	24.9	24.8	24.8	0.00	0.04	0.04	±0.20
33.3	33.0	33.0	33.4	33.2	33.2	0.03	0.05	0.05	±0.20
44.9	44.6	44.6	45.2	44.9	44.8	0.06	0.06	0.04	±0.20
61.0	60.6	60.6	61.2	60.8	60.9	0.03	0.03	0.04	±0.20
83.8	83.2	83.2	83.5	82.9	82.9	−0.03	−0.03	−0.03	±0.20
110	109	109	109	109	108	−0.08	0.00	−0.08	±0.20
151	150	150	150	149	149	−0.06	−0.06	−0.06	±0.20
209	207	207	209	207	207	0.00	0.00	0.00	±0.20
290	287	287	291	282	282	0.03	−0.15	−0.15	±0.20
427	424	423	422	418	417	−0.10	−0.12	−0.12	±0.20
589	584	582	586	580	579	−0.04	−0.06	−0.04	±0.20
880	871	867	883	873	871	0.03	0.02	0.04	±0.20
1330	1320	1310	1350	1340	1330	0.13	0.13	0.13	±0.30
1810	1790	1780	1860	1840	1830	0.24	0.24	0.24	±0.30
2980	2940	2920	3100	3030	3030	0.34	0.26	0.32	±0.40
3630	3570	3540	3790	3690	3700	0.37	0.29	0.38	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0 dB for applied H-fields < 2.0 A/m
- ±0.2 dB for applied H-fields ≥ 2.0 A/m and < 1000 A/m
- ±0.3 dB for applied H-fields ≥ 1000 A/m and < 2000 A/m
- ±0.4 dB for applied H-fields ≥ 2000 A/m and < 3000 A/m
- ±0.5 dB for applied H-fields ≥ 3000 A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 4

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.380	0.380	0.380	0.390	0.410	0.400	0.23	0.66	0.45	±1.00
0.510	0.520	0.520	0.540	0.530	0.530	0.50	0.17	0.17	±1.00
0.700	0.720	0.710	0.730	0.730	0.720	0.36	0.12	0.12	±1.00
0.920	0.940	0.930	0.940	0.940	0.930	0.19	0.00	0.00	±1.00
1.24	1.27	1.25	1.25	1.26	1.25	0.07	−0.07	0.00	±1.00
1.71	1.74	1.72	1.70	1.74	1.71	−0.05	0.00	−0.05	±1.00
2.28	2.32	2.30	2.28	2.31	2.30	0.00	−0.04	0.00	±0.20
3.04	3.10	3.07	3.06	3.09	3.07	0.06	−0.03	0.00	±0.20
4.13	4.21	4.16	4.13	4.22	4.17	0.00	0.02	0.02	±0.20
5.59	5.70	5.62	5.58	5.71	5.64	−0.02	0.02	0.03	±0.20
7.51	7.65	7.56	7.52	7.67	7.58	0.01	0.02	0.02	±0.20
10.0	10.2	10.1	10.1	10.2	10.1	0.09	0.00	0.00	±0.20
13.6	13.8	13.6	13.6	13.8	13.7	0.00	0.00	0.06	±0.20
18.3	18.6	18.4	18.4	18.7	18.4	0.05	0.05	0.00	±0.20
24.7	25.1	24.9	24.7	25.2	24.9	0.00	0.03	0.00	±0.20
33.0	33.6	33.2	33.1	33.8	33.4	0.03	0.05	0.05	±0.20
44.5	45.4	44.8	44.8	45.7	45.1	0.06	0.06	0.06	±0.20
60.5	61.6	60.9	60.7	61.9	61.2	0.03	0.04	0.04	±0.20
83.1	84.7	83.6	82.8	84.3	83.2	−0.03	−0.04	−0.04	±0.20
109	111	109	108	110	109	−0.08	−0.08	0.00	±0.20
149	152	150	149	152	150	0.00	0.00	0.00	±0.20
207	211	208	207	211	208	0.00	0.00	0.00	±0.20
287	292	288	289	287	283	0.06	−0.15	−0.15	±0.20
424	431	425	418	425	419	−0.12	−0.12	−0.12	±0.20
584	594	585	581	590	581	−0.04	−0.06	−0.06	±0.20
873	886	872	876	889	874	0.03	0.03	0.02	±0.20
1320	1340	1320	1340	1360	1340	0.13	0.13	0.13	±0.30
1800	1820	1790	1850	1870	1840	0.24	0.24	0.24	±0.30
2960	2990	2930	3070	3100	3050	0.32	0.31	0.35	±0.40
3600	3640	3560	3760	3790	3710	0.38	0.35	0.36	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0 dB for applied H-fields < 2.0 A/m
- ±0.2 dB for applied H-fields ≥ 2.0 A/m and < 1000 A/m
- ±0.3 dB for applied H-fields ≥ 1000 A/m and < 2000 A/m
- ±0.4 dB for applied H-fields ≥ 2000 A/m and < 3000 A/m
- ±0.5 dB for applied H-fields ≥ 3000 A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 5

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.380	0.390	0.390	0.400	0.410	0.390	0.45	0.43	0.00	±1.00
0.520	0.530	0.530	0.540	0.540	0.530	0.33	0.16	0.00	±1.00
0.720	0.720	0.730	0.720	0.710	0.720	0.00	−0.12	−0.12	±1.00
0.930	0.940	0.950	0.940	0.930	0.940	0.09	−0.09	−0.09	±1.00
1.27	1.28	1.28	1.26	1.28	1.28	−0.07	0.00	0.00	±1.00
1.74	1.76	1.76	1.73	1.77	1.75	−0.05	0.05	−0.05	±1.00
2.32	2.34	2.35	2.32	2.35	2.34	0.00	0.04	−0.04	±0.20
3.10	3.13	3.13	3.10	3.14	3.13	0.00	0.03	0.00	±0.20
4.20	4.24	4.25	4.21	4.26	4.24	0.02	0.04	−0.02	±0.20
5.69	5.74	5.75	5.71	5.75	5.75	0.03	0.02	0.00	±0.20
7.64	7.72	7.73	7.67	7.75	7.75	0.03	0.03	0.02	±0.20
10.2	10.3	10.3	10.2	10.3	10.3	0.00	0.00	0.00	±0.20
13.8	13.9	13.9	13.8	14.0	14.0	0.00	0.06	0.06	±0.20
18.6	18.8	18.8	18.7	18.8	18.8	0.05	0.00	0.00	±0.20
25.1	25.4	25.4	25.2	25.4	25.4	0.03	0.00	0.00	±0.20
33.6	33.9	33.9	33.7	34.1	34.1	0.03	0.05	0.05	±0.20
45.3	45.8	45.8	45.6	46.1	46.0	0.06	0.06	0.04	±0.20
61.5	62.2	62.2	61.8	62.4	62.5	0.04	0.03	0.04	±0.20
84.6	85.4	85.4	84.2	85.0	85.1	−0.04	−0.04	−0.03	±0.20
111	112	112	110	111	111	−0.08	−0.08	−0.08	±0.20
152	154	154	152	153	153	0.00	−0.06	−0.06	±0.20
211	213	213	211	212	212	0.00	−0.04	−0.04	±0.20
292	295	295	294	289	289	0.06	−0.18	−0.18	±0.20
431	435	434	425	429	428	−0.12	−0.12	−0.12	±0.20
595	599	598	591	595	594	−0.06	−0.06	−0.06	±0.20
888	894	890	891	896	894	0.03	0.02	0.04	±0.20
1340	1350	1340	1370	1370	1370	0.19	0.13	0.19	±0.30
1830	1840	1830	1880	1890	1880	0.23	0.23	0.23	±0.30
3010	3020	3000	3120	3130	3110	0.31	0.31	0.31	±0.50
3670	3670	3640	3820	3820	3800	0.35	0.35	0.37	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0 dB for applied H-fields < 2.0 A/m
- ±0.2 dB for applied H-fields ≥ 2.0 A/m and < 1000 A/m
- ±0.3 dB for applied H-fields ≥ 1000 A/m and < 2000 A/m
- ±0.4 dB for applied H-fields ≥ 2000 A/m and < 3000 A/m
- ±0.5 dB for applied H-fields ≥ 3000 A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 6

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.390	0.390	0.380	0.400	0.400	0.390	0.22	0.22	0.23	±1.00
0.530	0.530	0.520	0.520	0.550	0.530	−0.17	0.32	0.17	±1.00
0.730	0.730	0.720	0.710	0.750	0.730	−0.24	0.23	0.12	±1.00
0.950	0.950	0.940	0.950	0.950	0.940	0.00	0.00	0.00	±1.00
1.28	1.28	1.27	1.29	1.28	1.27	0.07	0.00	0.00	±1.00
1.76	1.76	1.74	1.77	1.76	1.75	0.05	0.00	0.05	±1.00
2.35	2.34	2.32	2.34	2.36	2.33	−0.04	0.07	0.04	±0.20
3.14	3.13	3.10	3.14	3.14	3.11	0.00	0.03	0.03	±0.20
4.26	4.25	4.20	4.27	4.27	4.22	0.02	0.04	0.04	±0.20
5.77	5.75	5.68	5.76	5.78	5.70	−0.02	0.05	0.03	±0.20
7.74	7.73	7.64	7.76	7.76	7.67	0.02	0.03	0.03	±0.20
10.3	10.3	10.2	10.4	10.3	10.2	0.08	0.00	0.00	±0.20
14.0	13.9	13.8	14.0	14.0	13.8	0.00	0.06	0.00	±0.20
18.8	18.8	18.6	18.9	18.9	18.6	0.05	0.05	0.00	±0.20
25.4	25.4	25.1	25.4	25.4	25.1	0.00	0.00	0.00	±0.20
34.0	33.9	33.5	34.1	34.1	33.7	0.03	0.05	0.05	±0.20
45.9	45.9	45.3	46.2	46.1	45.5	0.06	0.04	0.04	±0.20
62.4	62.3	61.5	62.6	62.5	61.7	0.03	0.03	0.03	±0.20
85.7	85.5	84.4	85.4	85.2	84.1	−0.03	−0.03	−0.03	±0.20
112	112	110	112	112	110	0.00	0.00	0.00	±0.20
154	154	152	154	153	151	0.00	−0.06	−0.06	±0.20
214	213	210	213	213	210	−0.04	0.00	0.00	±0.20
296	295	291	298	290	286	0.06	−0.15	−0.15	±0.20
437	435	429	431	430	423	−0.12	−0.10	−0.12	±0.20
603	600	590	599	596	587	−0.06	−0.06	−0.04	±0.20
900	895	880	903	897	884	0.03	0.02	0.04	±0.20
1360	1350	1330	1380	1380	1350	0.13	0.19	0.13	±0.30
1850	1840	1810	1910	1890	1860	0.28	0.23	0.24	±0.30
3050	3020	2960	3170	3140	3080	0.34	0.34	0.35	±0.50
3710	3670	3590	3870	3830	3750	0.37	0.37	0.38	±0.50

SPEAG H-field linearity tolerance criteria[1]:
- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

[1] Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 7

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			
x	y	z	x	y	z	x	y	z	Tolerance/(dB)
0.390	0.380	0.370	0.410	0.400	0.400	0.43	0.45	0.68	±1.00
0.530	0.510	0.510	0.530	0.520	0.540	0.00	0.17	0.50	±1.00
0.720	0.710	0.700	0.720	0.700	0.700	0.00	−0.12	0.00	±1.00
0.940	0.920	0.910	0.950	0.930	0.910	0.09	0.09	0.00	±1.00
1.28	1.25	1.24	1.28	1.28	1.25	0.00	0.21	0.07	±1.00
1.76	1.72	1.70	1.75	1.74	1.69	−0.05	0.10	−0.05	±1.00
2.34	2.29	2.26	2.34	2.33	2.27	0.00	0.15	0.04	±0.20
3.13	3.06	3.02	3.13	3.11	3.02	0.00	0.14	0.00	±0.20
4.24	4.15	4.10	4.26	4.20	4.10	0.04	0.10	0.00	±0.20
5.75	5.62	5.54	5.75	5.67	5.54	0.00	0.08	0.00	±0.20
7.72	7.55	7.46	7.72	7.60	7.45	0.00	0.06	−0.01	±0.20
10.3	10.1	9.95	10.3	10.1	10.0	0.00	0.00	0.04	±0.20
13.9	13.6	13.4	13.9	13.7	13.5	0.00	0.06	0.06	±0.20
18.8	18.4	18.1	18.8	18.4	18.2	0.00	0.00	0.05	±0.20
25.4	24.8	24.5	25.4	24.8	24.5	0.00	0.00	0.00	±0.20
33.9	33.1	32.7	34.0	33.3	32.9	0.03	0.05	0.05	±0.20
45.8	44.8	44.2	46.0	45.0	44.4	0.04	0.04	0.04	±0.20
62.2	60.8	60.0	62.4	61.0	60.3	0.03	0.03	0.04	±0.20
85.4	83.5	82.4	85.1	83.1	82.1	−0.03	−0.04	−0.03	±0.20
112	109	108	111	109	107	−0.08	0.00	−0.08	±0.20
154	150	148	153	150	148	−0.06	0.00	0.00	±0.20
213	208	205	213	208	205	0.00	0.00	0.00	±0.20
295	288	284	297	283	279	0.06	−0.15	−0.15	±0.20
436	425	419	430	419	413	−0.12	−0.12	−0.13	±0.20
601	586	576	597	582	572	−0.06	−0.06	−0.06	±0.20
897	874	859	900	876	862	0.03	0.02	0.03	±0.20
1360	1320	1300	1380	1340	1320	0.13	0.13	0.13	±0.30
1850	1800	1760	1900	1850	1810	0.23	0.24	0.24	±0.30
3040	2950	2890	3160	3060	3000	0.34	0.32	0.32	±0.50
3700	3580	3510	3860	3740	3660	0.37	0.38	0.36	±0.50

SPEAG H-field linearity tolerance criteria[1]:
±1.0dB for applied H-fields < 2.0A/m
±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
±0.5dB for applied H-fields ≥ 3000A/m

[1]Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, E-field, Channel 0

E-field/(V/m) Applied			E-field/(V/m) Reading			Difference/(dB)			Tolerance/(dB)		
x	y	z	x	y	z	x	y	z	x	y	z
0.330	0.200	0.090	0.340	0.210	0.070	0.26	0.42	−2.18	±5.00	±5.00	±5.00
0.440	0.280	0.120	0.450	0.290	0.140	0.20	0.30	1.34	±5.00	±5.00	±5.00
0.610	0.380	0.170	0.630	0.390	0.150	0.28	0.23	−1.09	±5.00	±5.00	±5.00
0.800	0.500	0.220	0.820	0.470	0.200	0.21	−0.54	−0.83	±5.00	±5.00	±5.00
1.08	0.670	0.300	1.08	0.670	0.310	0.00	0.00	0.28	±5.00	±5.00	±5.00
1.48	0.920	0.410	1.49	0.920	0.400	0.06	0.00	−0.21	±5.00	±5.00	±5.00
1.97	1.23	0.550	1.97	1.24	0.530	0.00	0.07	−0.32	±5.00	±5.00	±5.00
2.64	1.64	0.740	2.65	1.64	0.740	0.03	0.00	0.00	±1.00	±5.00	±5.00
3.58	2.22	1.00	3.59	2.22	0.970	0.02	0.00	−0.26	±1.00	±1.00	±5.00
4.84	3.01	1.35	4.85	2.99	1.30	0.02	−0.06	−0.33	±1.00	±1.00	±5.00
6.51	4.05	1.82	6.54	4.02	1.76	0.04	−0.06	−0.29	±1.00	±1.00	±5.00
8.68	5.40	2.43	8.72	5.38	2.39	0.04	−0.03	−0.14	±1.00	±1.00	±1.00
11.7	7.30	3.28	11.8	7.30	3.22	0.07	0.00	−0.16	±1.00	±1.00	±1.00
15.8	9.85	4.42	15.9	9.79	4.34	0.05	−0.05	−0.16	±1.00	±1.00	±1.00
21.4	13.3	5.97	21.5	13.2	5.85	0.04	−0.07	−0.18	±1.00	±1.00	±1.00
28.6	17.8	7.98	28.8	17.8	7.85	0.06	0.00	−0.14	±1.00	±1.00	±1.00
38.6	24.0	10.8	38.9	24.0	10.6	0.07	0.00	−0.16	±1.00	±1.00	±1.00
52.4	32.6	14.6	52.8	32.6	14.4	0.07	0.00	−0.12	±1.00	±1.00	±1.00
72.0	44.8	20.1	71.8	44.4	19.6	−0.02	−0.08	−0.22	±1.00	±1.00	±1.00
94.1	58.5	26.3	94.1	58.1	25.7	0.00	−0.06	−0.20	±1.00	±1.00	±1.00
129	80.5	36.2	129	79.9	35.4	0.00	−0.06	−0.19	±1.00	±1.00	±1.00
179	112	50.1	180	111	49.1	0.05	−0.08	−0.18	±1.00	±1.00	±1.00
249	155	69.5	251	155	68.6	0.07	0.00	−0.11	±1.00	±1.00	±1.00
366	228	103	356	218	102	−0.24	−0.39	−0.08	±1.00	±1.00	±1.00
505	314	141	495	304	141	−0.17	−0.28	0.00	±1.00	±1.00	±1.00
753	468	211	746	458	213	−0.08	−0.19	0.08	±1.00	±1.00	±1.00
1140	708	319	1140	702	327	0.00	−0.07	0.22	±1.00	±1.00	±1.00
1550	963	435	1580	966	451	0.17	0.03	0.31	±1.00	±1.00	±1.00
2540	1580	716	2620	1600	713	0.27	0.11	−0.04	±1.00	±1.00	±1.00
3090	1920	871	3200	1960	874	0.30	0.18	0.03	±1.00	±1.00	±1.00

SPEAG E-field linearity tolerance criteria[1]:
±5.0dB for applied E-field < 2V/m
±1.0dB for applied E-field ≥ 2V/m

[1]Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response

Frequency Response, H-field, Channel 0

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.54	1.54	0.06	0.00	0.00	±0.3
3200	1.54	1.54	1.53	1.54	1.56	1.54	0.00	0.11	0.06	±0.3
4000	1.53	1.53	1.53	1.54	1.53	1.53	0.06	0.00	0.00	±0.3
5200	1.52	1.52	1.51	1.52	1.52	1.53	0.00	0.00	0.11	±0.3
6600	1.51	1.51	1.50	1.52	1.50	1.51	0.06	−0.06	0.06	±0.3
8200	1.50	1.50	1.49	1.51	1.49	1.50	0.06	−0.06	0.06	±0.3
9000	1.49	1.49	1.49	1.50	1.49	1.49	0.06	0.00	0.00	±0.3
10600	4.36	4.26	4.24	4.38	4.31	4.31	0.04	0.10	0.14	±0.3
13400	4.38	4.33	4.31	4.41	4.35	4.33	0.06	0.04	0.04	±0.3
17000	4.39	4.32	4.30	4.41	4.35	4.33	0.04	0.06	0.06	±0.3
21400	4.41	4.34	4.33	4.43	4.35	4.35	0.04	0.02	0.04	±0.3
27200	4.41	4.34	4.32	4.43	4.36	4.35	0.04	0.04	0.06	±0.3
34400	4.41	4.35	4.33	4.43	4.37	4.35	0.04	0.04	0.04	±0.3
40000	4.40	4.34	4.33	4.43	4.37	4.35	0.06	0.06	0.04	±0.3
43600	4.39	4.34	4.32	4.41	4.36	4.33	0.04	0.04	0.02	±0.3
55400	4.38	4.32	4.31	4.40	4.34	4.33	0.04	0.04	0.04	±0.3
70000	4.37	4.32	4.30	4.38	4.33	4.31	0.02	0.02	0.02	±0.3
88800	4.35	4.30	4.29	4.37	4.31	4.30	0.04	0.02	0.02	±0.3
112400	4.34	4.29	4.28	4.36	4.29	4.29	0.04	0.00	0.02	±0.3
142400	4.32	4.27	4.26	4.33	4.28	4.26	0.02	0.02	0.00	±0.3
161750	4.30	4.25	4.24	4.30	4.26	4.24	0.00	0.02	0.00	±0.3
180400	4.29	4.25	4.23	4.29	4.25	4.23	0.00	0.00	0.00	±0.3
228400	4.26	4.21	4.20	4.26	4.22	4.20	0.00	0.02	0.00	±0.3
289400	4.22	4.18	4.17	4.21	4.18	4.17	−0.02	0.00	0.00	±0.3
366400	4.18	4.14	4.13	4.18	4.14	4.13	0.00	0.00	0.00	±0.3
400000	4.16	4.12	4.11	4.16	4.12	4.11	0.00	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.13	4.10	4.08	0.00	0.02	0.00	±0.3
587800	4.09	4.05	4.04	4.09	4.05	4.04	0.00	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	4.00	3.99	0.00	0.00	0.00	±0.3
942600	4.02	3.99	3.98	4.02	3.99	3.98	0.00	0.00	0.00	±0.3
1193600	4.00	3.97	3.96	3.99	3.97	3.96	−0.02	0.00	0.00	±0.3
1511600	3.99	3.96	3.95	3.99	3.96	3.95	0.00	0.00	0.00	±0.3
1914400	3.98	3.94	3.94	3.97	3.95	3.93	−0.02	0.02	−0.02	±0.3
2424400	3.96	3.93	3.92	3.96	3.93	3.92	0.00	0.00	0.00	±0.3
3070200	3.94	3.90	3.89	3.94	3.90	3.89	0.00	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.88	3.85	3.83	0.00	0.00	−0.02	±0.3
4000000	3.87	3.84	3.83	3.87	3.83	3.82	0.00	−0.02	−0.02	±0.3
4923800	3.81	3.78	3.77	3.80	3.77	3.77	−0.02	−0.02	0.00	±0.3
6235400	3.70	3.67	3.66	3.69	3.66	3.65	−0.02	−0.02	−0.02	±0.3
7896400	3.56	3.52	3.52	3.55	3.52	3.51	−0.02	0.00	−0.02	±0.3
10000000	3.41	3.38	3.38	3.41	3.38	3.35	0.00	0.00	−0.08	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1]Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 1

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.56	1.55	1.55	0.11	0.06	0.06	±0.3
3200	1.54	1.54	1.53	1.53	1.57	1.54	−0.06	0.17	0.06	±0.3
4000	1.53	1.53	1.53	1.54	1.53	1.54	0.06	0.00	0.06	±0.3
5200	1.52	1.52	1.51	1.53	1.52	1.53	0.06	0.00	0.11	±0.3
6600	1.51	1.51	1.50	1.53	1.51	1.51	0.11	0.00	0.06	±0.3
8200	1.50	1.50	1.49	1.51	1.50	1.50	0.06	0.00	0.06	±0.3
9000	1.49	1.49	1.49	1.50	1.50	1.50	0.06	0.06	0.06	±0.3
10600	4.36	4.26	4.24	4.38	4.27	4.31	0.04	0.02	0.14	±0.3
13400	4.38	4.33	4.31	4.42	4.34	4.34	0.08	0.02	0.06	±0.3
17000	4.39	4.32	4.30	4.41	4.34	4.33	0.04	0.04	0.06	±0.3
21400	4.41	4.34	4.33	4.44	4.37	4.36	0.06	0.06	0.06	±0.3
27200	4.41	4.34	4.32	4.43	4.36	4.34	0.04	0.04	0.04	±0.3
34400	4.41	4.35	4.33	4.42	4.37	4.36	0.02	0.04	0.06	±0.3
40000	4.40	4.34	4.33	4.42	4.36	4.35	0.04	0.04	0.04	±0.3
43600	4.39	4.34	4.32	4.41	4.36	4.33	0.04	0.04	0.02	±0.3
55400	4.38	4.32	4.31	4.39	4.34	4.33	0.02	0.04	0.04	±0.3
70000	4.37	4.32	4.30	4.39	4.33	4.31	0.04	0.02	0.02	±0.3
88800	4.35	4.30	4.29	4.36	4.32	4.30	0.02	0.04	0.02	±0.3
112400	4.34	4.29	4.28	4.35	4.30	4.29	0.02	0.02	0.02	±0.3
142400	4.32	4.27	4.26	4.33	4.27	4.27	0.02	0.00	0.02	±0.3
161750	4.30	4.25	4.24	4.31	4.26	4.25	0.02	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.29	4.24	4.24	0.00	−0.02	0.02	±0.3
228400	4.26	4.21	4.20	4.26	4.21	4.20	0.00	0.00	0.00	±0.3
289400	4.22	4.18	4.17	4.22	4.17	4.17	0.00	−0.02	0.00	±0.3
366400	4.18	4.14	4.13	4.18	4.12	4.13	0.00	−0.04	0.00	±0.3
400000	4.16	4.12	4.11	4.15	4.12	4.11	−0.02	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.12	4.09	4.09	−0.02	0.00	0.02	±0.3
587800	4.09	4.05	4.04	4.08	4.05	4.04	−0.02	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	3.99	4.00	0.00	−0.02	0.02	±0.3
942600	4.02	3.99	3.98	4.01	3.99	3.99	−0.02	0.00	0.02	±0.3
1193600	4.00	3.97	3.96	3.99	3.96	3.96	−0.02	−0.02	0.00	±0.3
1511600	3.99	3.96	3.95	3.99	3.96	3.96	0.00	0.00	0.02	±0.3
1914400	3.98	3.94	3.94	3.98	3.94	3.94	0.00	0.00	0.00	±0.3
2424400	3.96	3.93	3.92	3.96	3.92	3.92	0.00	−0.02	0.00	±0.3
3070200	3.94	3.90	3.89	3.93	3.90	3.89	−0.02	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.88	3.84	3.84	0.00	−0.02	0.00	±0.3
4000000	3.87	3.84	3.83	3.87	3.83	3.83	0.00	−0.02	0.00	±0.3
4923800	3.81	3.78	3.77	3.80	3.77	3.77	−0.02	−0.02	0.00	±0.3
6235400	3.70	3.67	3.66	3.69	3.66	3.66	−0.02	−0.02	0.00	±0.3
7896400	3.56	3.52	3.52	3.55	3.52	3.51	−0.02	0.00	−0.02	±0.3
10000000	3.41	3.38	3.38	3.40	3.38	3.36	−0.03	0.00	−0.05	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1] Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 2

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.55	1.54	0.06	0.06	0.00	±0.3
3200	1.54	1.54	1.53	1.52	1.57	1.53	−0.11	0.17	0.00	±0.3
4000	1.53	1.53	1.53	1.54	1.54	1.53	0.06	0.06	0.00	±0.3
5200	1.52	1.52	1.51	1.52	1.52	1.52	0.00	0.00	0.06	±0.3
6600	1.51	1.51	1.50	1.52	1.51	1.51	0.06	0.00	0.06	±0.3
8200	1.50	1.50	1.49	1.50	1.49	1.50	0.00	−0.06	0.06	±0.3
9000	1.49	1.49	1.49	1.50	1.50	1.49	0.06	0.06	0.00	±0.3
10600	4.36	4.26	4.24	4.38	4.29	4.27	0.04	0.06	0.06	±0.3
13400	4.38	4.33	4.31	4.42	4.35	4.32	0.08	0.04	0.02	±0.3
17000	4.39	4.32	4.30	4.41	4.34	4.33	0.04	0.04	0.06	±0.3
21400	4.41	4.34	4.33	4.44	4.35	4.35	0.06	0.02	0.04	±0.3
27200	4.41	4.34	4.32	4.42	4.35	4.33	0.02	0.02	0.02	±0.3
34400	4.41	4.35	4.33	4.43	4.36	4.35	0.04	0.02	0.04	±0.3
40000	4.40	4.34	4.33	4.42	4.36	4.34	0.04	0.04	0.02	±0.3
43600	4.39	4.34	4.32	4.41	4.35	4.34	0.04	0.02	0.04	±0.3
55400	4.38	4.32	4.31	4.40	4.34	4.33	0.04	0.04	0.04	±0.3
70000	4.37	4.32	4.30	4.38	4.33	4.31	0.02	0.02	0.02	±0.3
88800	4.35	4.30	4.29	4.37	4.31	4.29	0.04	0.02	0.00	±0.3
112400	4.34	4.29	4.28	4.35	4.29	4.28	0.02	0.00	0.00	±0.3
142400	4.32	4.27	4.26	4.33	4.28	4.26	0.02	0.02	0.00	±0.3
161750	4.30	4.25	4.24	4.30	4.26	4.25	0.00	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.29	4.25	4.24	0.00	0.00	0.02	±0.3
228400	4.26	4.21	4.20	4.26	4.21	4.20	0.00	0.00	0.00	±0.3
289400	4.22	4.18	4.17	4.22	4.18	4.16	0.00	0.00	−0.02	±0.3
366400	4.18	4.14	4.13	4.18	4.14	4.12	0.00	0.00	−0.02	±0.3
400000	4.16	4.12	4.11	4.16	4.12	4.11	0.00	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.13	4.09	4.08	0.00	0.00	0.00	±0.3
587800	4.09	4.05	4.04	4.08	4.05	4.04	−0.02	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	4.00	4.00	0.00	0.00	0.02	±0.3
942600	4.02	3.99	3.98	4.01	3.99	3.98	−0.02	0.00	0.00	±0.3
1193600	4.00	3.97	3.96	3.99	3.96	3.96	−0.02	−0.02	0.00	±0.3
1511600	3.99	3.96	3.95	3.98	3.95	3.95	−0.02	−0.02	0.00	±0.3
1914400	3.98	3.94	3.94	3.97	3.94	3.93	−0.02	0.00	−0.02	±0.3
2424400	3.96	3.93	3.92	3.96	3.92	3.92	0.00	−0.02	0.00	±0.3
3070200	3.94	3.90	3.89	3.93	3.90	3.89	−0.02	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.86	3.84	3.83	−0.04	−0.02	−0.02	±0.3
4000000	3.87	3.84	3.83	3.86	3.83	3.83	−0.02	−0.02	0.00	±0.3
4923800	3.81	3.78	3.77	3.80	3.76	3.77	−0.02	−0.05	0.00	±0.3
6235400	3.70	3.67	3.66	3.68	3.65	3.66	−0.05	−0.05	0.00	±0.3
7896400	3.56	3.52	3.52	3.54	3.52	3.52	−0.05	0.00	0.00	±0.3
10000000	3.41	3.38	3.38	3.40	3.37	3.38	−0.03	−0.03	0.00	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1] Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 3

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.56	1.55	0.06	0.11	0.06	±0.3
3200	1.54	1.54	1.53	1.52	1.56	1.54	−0.11	0.11	0.06	±0.3
4000	1.53	1.53	1.53	1.53	1.54	1.55	0.00	0.06	0.11	±0.3
5200	1.52	1.52	1.51	1.51	1.52	1.54	−0.06	0.00	0.17	±0.3
6600	1.51	1.51	1.50	1.51	1.51	1.52	0.00	0.00	0.12	±0.3
8200	1.50	1.50	1.49	1.50	1.50	1.50	0.00	0.00	0.06	±0.3
9000	1.49	1.49	1.49	1.49	1.50	1.50	0.00	0.06	0.06	±0.3
10600	4.36	4.26	4.24	4.41	4.28	4.30	0.10	0.04	0.12	±0.3
13400	4.38	4.33	4.31	4.41	4.36	4.33	0.06	0.06	0.04	±0.3
17000	4.39	4.32	4.30	4.42	4.34	4.32	0.06	0.04	0.04	±0.3
21400	4.41	4.34	4.33	4.44	4.37	4.36	0.06	0.06	0.06	±0.3
27200	4.41	4.34	4.32	4.44	4.37	4.34	0.06	0.06	0.04	±0.3
34400	4.41	4.35	4.33	4.42	4.38	4.36	0.02	0.06	0.06	±0.3
40000	4.40	4.34	4.33	4.42	4.37	4.36	0.04	0.06	0.06	±0.3
43600	4.39	4.34	4.32	4.43	4.35	4.34	0.08	0.02	0.04	±0.3
55400	4.38	4.32	4.31	4.40	4.34	4.33	0.04	0.04	0.04	±0.3
70000	4.37	4.32	4.30	4.38	4.33	4.32	0.02	0.02	0.04	±0.3
88800	4.35	4.30	4.29	4.36	4.31	4.31	0.02	0.02	0.04	±0.3
112400	4.34	4.29	4.28	4.34	4.30	4.29	0.00	0.02	0.02	±0.3
142400	4.32	4.27	4.26	4.33	4.30	4.27	0.02	0.06	0.02	±0.3
161750	4.30	4.25	4.24	4.31	4.26	4.25	0.02	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.29	4.25	4.24	0.00	0.00	0.02	±0.3
228400	4.26	4.21	4.20	4.24	4.22	4.21	−0.04	0.02	0.02	±0.3
289400	4.22	4.18	4.17	4.22	4.19	4.17	0.00	0.02	0.00	±0.3
366400	4.18	4.14	4.13	4.18	4.14	4.13	0.00	0.00	0.00	±0.3
400000	4.16	4.12	4.11	4.16	4.12	4.11	0.00	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.13	4.10	4.08	0.00	0.02	0.00	±0.3
587800	4.09	4.05	4.04	4.08	4.05	4.04	−0.02	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	4.01	4.00	0.00	0.02	0.02	±0.3
942600	4.02	3.99	3.98	4.01	3.99	3.99	−0.02	0.00	0.02	±0.3
1193600	4.00	3.97	3.96	4.00	3.97	3.96	0.00	0.00	0.00	±0.3
1511600	3.99	3.96	3.95	3.99	3.96	3.95	0.00	0.00	0.00	±0.3
1914400	3.98	3.94	3.94	3.97	3.95	3.94	−0.02	0.02	0.00	±0.3
2424400	3.96	3.93	3.92	3.95	3.93	3.92	−0.02	0.00	0.00	±0.3
3070200	3.94	3.90	3.89	3.92	3.91	3.89	−0.04	0.02	0.00	±0.3
3888000	3.88	3.85	3.84	3.88	3.85	3.84	0.00	0.00	0.00	±0.3
4000000	3.87	3.84	3.83	3.87	3.84	3.83	0.00	0.00	0.00	±0.3
4923800	3.81	3.78	3.77	3.80	3.79	3.77	−0.02	0.02	0.00	±0.3
6235400	3.70	3.67	3.66	3.68	3.66	3.66	−0.05	−0.02	0.00	±0.3
7896400	3.56	3.52	3.52	3.55	3.53	3.52	−0.02	0.02	0.00	±0.3
10000000	3.41	3.38	3.38	3.40	3.38	3.38	−0.03	0.00	0.00	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1] Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 4

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.56	1.55	1.55	0.11	0.06	0.06	±0.3
3200	1.54	1.54	1.53	1.53	1.57	1.54	−0.06	0.17	0.06	±0.3
4000	1.53	1.53	1.53	1.54	1.54	1.53	0.06	0.06	0.00	±0.3
5200	1.52	1.52	1.51	1.52	1.52	1.53	0.00	0.00	0.11	±0.3
6600	1.51	1.51	1.50	1.52	1.51	1.52	0.06	0.00	0.12	±0.3
8200	1.50	1.50	1.49	1.50	1.50	1.50	0.00	0.00	0.06	±0.3
9000	1.49	1.49	1.49	1.50	1.50	1.50	0.06	0.06	0.06	±0.3
10600	4.36	4.26	4.24	4.39	4.32	4.29	0.06	0.12	0.10	±0.3
13400	4.38	4.33	4.31	4.39	4.35	4.33	0.02	0.04	0.04	±0.3
17000	4.39	4.32	4.30	4.42	4.35	4.33	0.06	0.06	0.06	±0.3
21400	4.41	4.34	4.33	4.45	4.36	4.33	0.08	0.04	0.00	±0.3
27200	4.41	4.34	4.32	4.42	4.36	4.34	0.02	0.04	0.04	±0.3
34400	4.41	4.35	4.33	4.43	4.36	4.35	0.04	0.02	0.04	±0.3
40000	4.40	4.34	4.33	4.41	4.37	4.35	0.02	0.06	0.04	±0.3
43600	4.39	4.34	4.32	4.40	4.37	4.33	0.02	0.06	0.02	±0.3
55400	4.38	4.32	4.31	4.39	4.34	4.32	0.02	0.04	0.02	±0.3
70000	4.37	4.32	4.30	4.38	4.33	4.31	0.02	0.02	0.02	±0.3
88800	4.35	4.30	4.29	4.36	4.32	4.30	0.02	0.04	0.02	±0.3
112400	4.34	4.29	4.28	4.34	4.30	4.28	0.00	0.02	0.00	±0.3
142400	4.32	4.27	4.26	4.32	4.26	4.27	0.00	−0.02	0.02	±0.3
161750	4.30	4.25	4.24	4.30	4.26	4.25	0.00	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.28	4.25	4.23	−0.02	0.00	0.00	±0.3
228400	4.26	4.21	4.20	4.29	4.22	4.20	0.06	0.02	0.00	±0.3
289400	4.22	4.18	4.17	4.21	4.17	4.17	−0.02	−0.02	0.00	±0.3
366400	4.18	4.14	4.13	4.17	4.14	4.13	−0.02	0.00	0.00	±0.3
400000	4.16	4.12	4.11	4.15	4.12	4.11	−0.02	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.12	4.09	4.08	−0.02	0.00	0.00	±0.3
587800	4.09	4.05	4.04	4.08	4.05	4.04	−0.02	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.02	4.00	4.00	−0.02	0.00	0.02	±0.3
942600	4.02	3.99	3.98	4.01	3.99	3.98	−0.02	0.00	0.00	±0.3
1193600	4.00	3.97	3.96	3.98	3.96	3.96	−0.04	−0.02	0.00	±0.3
1511600	3.99	3.96	3.95	3.98	3.96	3.96	−0.02	0.00	0.02	±0.3
1914400	3.98	3.94	3.94	3.97	3.94	3.93	−0.02	0.00	−0.02	±0.3
2424400	3.96	3.93	3.92	3.95	3.93	3.91	−0.02	0.00	−0.02	±0.3
3070200	3.94	3.90	3.89	3.93	3.90	3.89	−0.02	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.87	3.85	3.83	−0.02	0.00	−0.02	±0.3
4000000	3.87	3.84	3.83	3.86	3.83	3.82	−0.02	−0.02	−0.02	±0.3
4923800	3.81	3.78	3.77	3.79	3.77	3.77	−0.05	−0.02	0.00	±0.3
6235400	3.70	3.67	3.66	3.69	3.67	3.66	−0.02	0.00	0.00	±0.3
7896400	3.56	3.52	3.52	3.54	3.53	3.51	−0.05	0.02	−0.02	±0.3
10000000	3.41	3.38	3.38	3.38	3.38	3.38	−0.08	0.00	0.00	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1] Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 5

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.55	1.54	0.06	0.06	0.00	±0.3
3200	1.54	1.54	1.53	1.52	1.57	1.54	−0.11	0.17	0.06	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.54	0.00	0.00	0.06	±0.3
5200	1.52	1.52	1.51	1.53	1.52	1.53	0.06	0.00	0.11	±0.3
6600	1.51	1.51	1.50	1.52	1.51	1.51	0.06	0.00	0.06	±0.3
8200	1.50	1.50	1.49	1.51	1.50	1.50	0.06	0.00	0.06	±0.3
9000	1.49	1.49	1.49	1.49	1.50	1.50	0.00	0.06	0.06	±0.3
10600	4.36	4.26	4.24	4.39	4.28	4.29	0.06	0.04	0.10	±0.3
13400	4.38	4.33	4.31	4.41	4.33	4.33	0.06	0.00	0.04	±0.3
17000	4.39	4.32	4.30	4.42	4.35	4.33	0.06	0.06	0.06	±0.3
21400	4.41	4.34	4.33	4.42	4.38	4.34	0.02	0.08	0.02	±0.3
27200	4.41	4.34	4.32	4.44	4.36	4.34	0.06	0.04	0.04	±0.3
34400	4.41	4.35	4.33	4.43	4.37	4.35	0.04	0.04	0.04	±0.3
40000	4.40	4.34	4.33	4.43	4.37	4.34	0.06	0.06	0.02	±0.3
43600	4.39	4.34	4.32	4.42	4.36	4.35	0.06	0.04	0.06	±0.3
55400	4.38	4.32	4.31	4.39	4.34	4.32	0.02	0.04	0.02	±0.3
70000	4.37	4.32	4.30	4.39	4.33	4.31	0.04	0.02	0.02	±0.3
88800	4.35	4.30	4.29	4.37	4.31	4.29	0.04	0.02	0.00	±0.3
112400	4.34	4.29	4.28	4.35	4.29	4.29	0.02	0.00	0.02	±0.3
142400	4.32	4.27	4.26	4.33	4.27	4.26	0.02	0.00	0.00	±0.3
161750	4.30	4.25	4.24	4.31	4.26	4.25	0.02	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.29	4.25	4.24	0.00	0.00	0.02	±0.3
228400	4.26	4.21	4.20	4.27	4.21	4.20	0.02	0.00	0.00	±0.3
289400	4.22	4.18	4.17	4.22	4.18	4.17	0.00	0.00	0.00	±0.3
366400	4.18	4.14	4.13	4.17	4.13	4.13	−0.02	−0.02	0.00	±0.3
400000	4.16	4.12	4.11	4.16	4.12	4.11	0.00	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.13	4.09	4.08	0.00	0.00	0.00	±0.3
587800	4.09	4.05	4.04	4.08	4.05	4.04	−0.02	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	4.00	3.99	0.00	0.00	0.00	±0.3
942600	4.02	3.99	3.98	4.01	3.99	3.98	−0.02	0.00	0.00	±0.3
1193600	4.00	3.97	3.96	3.99	3.97	3.96	−0.02	0.00	0.00	±0.3
1511600	3.99	3.96	3.95	3.98	3.97	3.95	−0.02	0.02	0.00	±0.3
1914400	3.98	3.94	3.94	3.97	3.94	3.93	−0.02	0.00	−0.02	±0.3
2424400	3.96	3.93	3.92	3.96	3.92	3.92	0.00	−0.02	0.00	±0.3
3070200	3.94	3.90	3.89	3.93	3.90	3.89	−0.02	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.88	3.85	3.83	0.00	0.00	−0.02	±0.3
4000000	3.87	3.84	3.83	3.87	3.84	3.83	0.00	0.00	0.00	±0.3
4923800	3.81	3.78	3.77	3.80	3.77	3.76	−0.02	−0.02	−0.02	±0.3
6235400	3.70	3.67	3.66	3.69	3.67	3.65	−0.02	0.00	−0.02	±0.3
7896400	3.56	3.52	3.52	3.55	3.52	3.51	−0.02	0.00	−0.02	±0.3
10000000	3.41	3.38	3.38	3.41	3.37	3.38	0.00	−0.03	0.00	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1]Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 6

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.55	1.55	0.06	0.06	0.06	±0.3
3200	1.54	1.54	1.53	1.52	1.57	1.54	−0.11	0.17	0.06	±0.3
4000	1.53	1.53	1.53	1.54	1.53	1.54	0.06	0.00	0.06	±0.3
5200	1.52	1.52	1.51	1.52	1.52	1.53	0.00	0.00	0.11	±0.3
6600	1.51	1.51	1.50	1.51	1.51	1.52	0.00	0.00	0.12	±0.3
8200	1.50	1.50	1.49	1.50	1.50	1.50	0.00	0.00	0.06	±0.3
9000	1.49	1.49	1.49	1.49	1.50	1.50	0.00	0.06	0.06	±0.3
10600	4.36	4.26	4.24	4.41	4.29	4.30	0.10	0.06	0.12	±0.3
13400	4.38	4.33	4.31	4.42	4.36	4.32	0.08	0.06	0.02	±0.3
17000	4.39	4.32	4.30	4.41	4.35	4.32	0.04	0.06	0.04	±0.3
21400	4.41	4.34	4.33	4.43	4.36	4.37	0.04	0.04	0.08	±0.3
27200	4.41	4.34	4.32	4.44	4.36	4.35	0.06	0.04	0.06	±0.3
34400	4.41	4.35	4.33	4.43	4.36	4.35	0.04	0.02	0.04	±0.3
40000	4.40	4.34	4.33	4.43	4.37	4.35	0.06	0.06	0.04	±0.3
43600	4.39	4.34	4.32	4.42	4.35	4.34	0.06	0.02	0.04	±0.3
55400	4.38	4.32	4.31	4.39	4.35	4.33	0.02	0.06	0.04	±0.3
70000	4.37	4.32	4.30	4.39	4.34	4.32	0.04	0.04	0.04	±0.3
88800	4.35	4.30	4.29	4.37	4.31	4.30	0.04	0.02	0.02	±0.3
112400	4.34	4.29	4.28	4.35	4.29	4.28	0.02	0.00	0.00	±0.3
142400	4.32	4.27	4.26	4.33	4.28	4.27	0.02	0.02	0.02	±0.3
161750	4.30	4.25	4.24	4.31	4.26	4.25	0.02	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.29	4.25	4.24	0.00	0.00	0.02	±0.3
228400	4.26	4.21	4.20	4.22	4.22	4.21	−0.08	0.02	0.02	±0.3
289400	4.22	4.18	4.17	4.22	4.18	4.17	0.00	0.00	0.00	±0.3
366400	4.18	4.14	4.13	4.18	4.14	4.13	0.00	0.00	0.00	±0.3
400000	4.16	4.12	4.11	4.16	4.12	4.11	0.00	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.13	4.09	4.08	0.00	0.00	0.00	±0.3
587800	4.09	4.05	4.04	4.09	4.05	4.04	0.00	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	4.00	3.99	0.00	0.00	0.00	±0.3
942600	4.02	3.99	3.98	4.02	3.98	3.98	0.00	−0.02	0.00	±0.3
1193600	4.00	3.97	3.96	3.99	3.96	3.96	−0.02	−0.02	0.00	±0.3
1511600	3.99	3.96	3.95	3.98	3.96	3.95	−0.02	0.00	0.00	±0.3
1914400	3.98	3.94	3.94	3.97	3.94	3.93	−0.02	0.00	−0.02	±0.3
2424400	3.96	3.93	3.92	3.96	3.93	3.92	0.00	0.00	0.00	±0.3
3070200	3.94	3.90	3.89	3.93	3.90	3.89	−0.02	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.88	3.85	3.83	0.00	0.00	−0.02	±0.3
4000000	3.87	3.84	3.83	3.87	3.84	3.82	0.00	0.00	−0.02	±0.3
4923800	3.81	3.78	3.77	3.80	3.77	3.76	−0.02	−0.02	−0.02	±0.3
6235400	3.70	3.67	3.66	3.69	3.67	3.65	−0.02	0.00	−0.02	±0.3
7896400	3.56	3.52	3.52	3.55	3.50	3.51	−0.02	−0.05	−0.02	±0.3
10000000	3.41	3.38	3.38	3.40	3.38	3.37	−0.03	0.00	−0.03	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1] Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 7

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.55	1.54	0.06	0.06	0.00	±0.3
3200	1.54	1.54	1.53	1.53	1.57	1.54	−0.06	0.17	0.06	±0.3
4000	1.53	1.53	1.53	1.54	1.53	1.54	0.06	0.00	0.06	±0.3
5200	1.52	1.52	1.51	1.53	1.52	1.53	0.06	0.00	0.11	±0.3
6600	1.51	1.51	1.50	1.53	1.51	1.52	0.11	0.00	0.12	±0.3
8200	1.50	1.50	1.49	1.51	1.49	1.50	0.06	−0.06	0.06	±0.3
9000	1.49	1.49	1.49	1.50	1.50	1.50	0.06	0.06	0.06	±0.3
10600	4.36	4.26	4.24	4.40	4.27	4.30	0.08	0.02	0.12	±0.3
13400	4.38	4.33	4.31	4.42	4.35	4.34	0.08	0.04	0.06	±0.3
17000	4.39	4.32	4.30	4.41	4.36	4.34	0.04	0.08	0.08	±0.3
21400	4.41	4.34	4.33	4.42	4.37	4.36	0.02	0.06	0.06	±0.3
27200	4.41	4.34	4.32	4.43	4.37	4.34	0.04	0.06	0.04	±0.3
34400	4.41	4.35	4.33	4.42	4.36	4.35	0.02	0.02	0.04	±0.3
40000	4.40	4.34	4.33	4.43	4.37	4.35	0.06	0.06	0.04	±0.3
43600	4.39	4.34	4.32	4.42	4.36	4.34	0.06	0.04	0.04	±0.3
55400	4.38	4.32	4.31	4.40	4.34	4.33	0.04	0.04	0.04	±0.3
70000	4.37	4.32	4.30	4.39	4.33	4.31	0.04	0.02	0.02	±0.3
88800	4.35	4.30	4.29	4.37	4.31	4.30	0.04	0.02	0.02	±0.3
112400	4.34	4.29	4.28	4.34	4.29	4.29	0.00	0.00	0.02	±0.3
142400	4.32	4.27	4.26	4.33	4.27	4.27	0.02	0.00	0.02	±0.3
161750	4.30	4.25	4.24	4.30	4.26	4.25	0.00	0.02	0.02	±0.3
180400	4.29	4.25	4.23	4.29	4.25	4.23	0.00	0.00	0.00	±0.3
228400	4.26	4.21	4.20	4.27	4.21	4.21	0.02	0.00	0.02	±0.3
289400	4.22	4.18	4.17	4.21	4.18	4.17	−0.02	0.00	0.00	±0.3
366400	4.18	4.14	4.13	4.18	4.14	4.13	0.00	0.00	0.00	±0.3
400000	4.16	4.12	4.11	4.15	4.12	4.11	−0.02	0.00	0.00	±0.3
464000	4.13	4.09	4.08	4.13	4.09	4.08	0.00	0.00	0.00	±0.3
587800	4.09	4.05	4.04	4.08	4.05	4.04	−0.02	0.00	0.00	±0.3
744200	4.03	4.00	3.99	4.03	4.00	4.00	0.00	0.00	0.02	±0.3
942600	4.02	3.99	3.98	4.01	3.99	3.98	−0.02	0.00	0.00	±0.3
1193600	4.00	3.97	3.96	3.99	3.97	3.96	−0.02	0.00	0.00	±0.3
1511600	3.99	3.96	3.95	3.99	3.96	3.95	0.00	0.00	0.00	±0.3
1914400	3.98	3.94	3.94	3.98	3.94	3.93	0.00	0.00	−0.02	±0.3
2424400	3.96	3.93	3.92	3.96	3.93	3.92	0.00	0.00	0.00	±0.3
3070200	3.94	3.90	3.89	3.92	3.90	3.89	−0.04	0.00	0.00	±0.3
3888000	3.88	3.85	3.84	3.87	3.84	3.83	−0.02	−0.02	−0.02	±0.3
4000000	3.87	3.84	3.83	3.87	3.83	3.82	0.00	−0.02	−0.02	±0.3
4923800	3.81	3.78	3.77	3.80	3.77	3.76	−0.02	−0.02	−0.02	±0.3
6235400	3.70	3.67	3.66	3.69	3.67	3.65	−0.02	0.00	−0.02	±0.3
7896400	3.56	3.52	3.52	3.55	3.52	3.51	−0.02	0.00	−0.02	±0.3
10000000	3.41	3.38	3.38	3.40	3.37	3.40	−0.03	−0.03	0.05	±0.3

SPEAG H-field frequency response tolerance criteria[1]:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

[1] Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, E-field, Channel 0

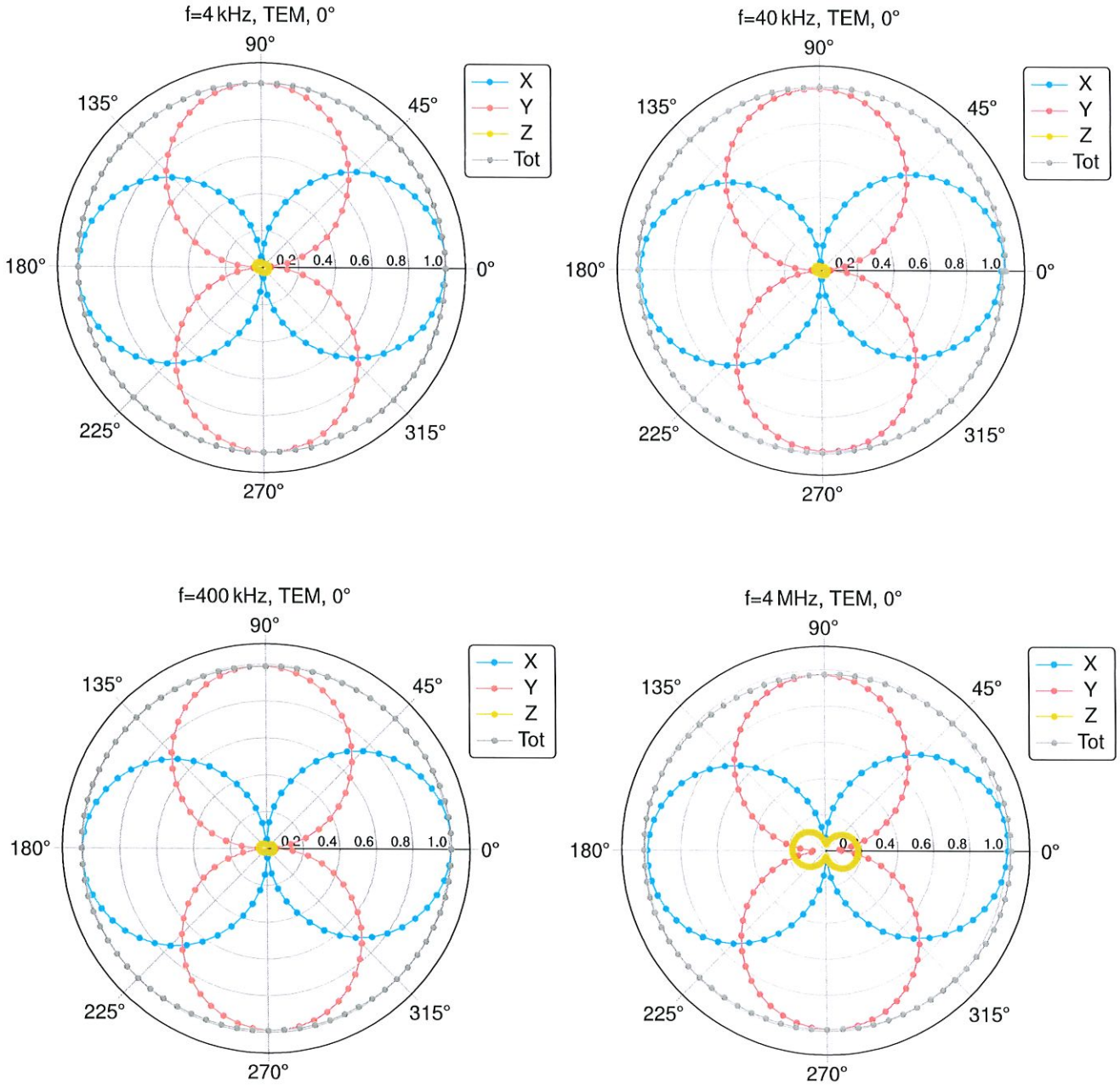
f/(Hz)	E-field/(V/m) Applied			E-field/(V/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	82.8	82.8	83.7	82.7	82.8	83.7	−0.01	0.00	0.00	±0.3
3200	82.2	82.2	79.2	82.5	81.6	79.8	0.03	−0.06	0.07	±0.3
4000	85.7	85.7	82.9	85.7	85.6	82.9	0.00	−0.01	0.00	±0.3
5200	80.3	80.3	80.0	80.7	80.8	79.3	0.04	0.05	−0.08	±0.3
6600	80.0	80.0	78.3	80.1	80.2	78.4	0.01	0.02	0.01	±0.3
8200	79.5	79.5	77.6	79.8	79.1	77.7	0.03	−0.04	0.01	±0.3
9000	79.9	79.9	80.0	79.9	80.0	80.0	0.00	0.01	0.00	±0.3
10600	81.5	81.5	77.7	81.5	81.5	77.6	0.00	0.00	−0.01	±0.3
13400	80.1	80.1	79.2	80.1	80.1	79.1	0.00	0.00	−0.01	±0.3
17000	79.2	79.2	79.8	79.2	79.2	79.8	0.00	0.00	0.00	±0.3
21400	77.2	77.2	77.7	77.2	77.2	77.6	0.00	0.00	−0.01	±0.3
27200	77.6	77.6	77.0	77.7	77.7	77.1	0.01	0.01	0.01	±0.3
34400	79.5	79.5	78.1	79.5	79.5	78.1	0.00	0.00	0.00	±0.3
40000	79.0	79.0	78.7	79.0	79.1	78.7	0.00	0.01	0.00	±0.3
43600	79.4	79.4	78.4	79.4	79.5	78.5	0.00	0.01	0.01	±0.3
55400	78.9	78.9	77.8	78.9	78.9	77.8	0.00	0.00	0.00	±0.3
70000	79.4	79.4	78.2	79.4	79.4	78.2	0.00	0.00	0.00	±0.3
88800	79.2	79.2	78.4	79.2	79.2	78.5	0.00	0.00	0.01	±0.3
112400	79.1	79.1	78.3	79.1	79.1	78.3	0.00	0.00	0.00	±0.3
142400	79.5	79.5	78.5	79.5	79.5	78.5	0.00	0.00	0.00	±0.3
161750	79.9	79.9	79.1	79.9	79.9	79.1	0.00	0.00	0.00	±0.3
180400	80.2	80.2	79.3	80.2	80.2	79.3	0.00	0.00	0.00	±0.3
228400	80.9	80.9	79.7	80.9	80.9	79.7	0.00	0.00	0.00	±0.3
289400	80.9	80.9	80.0	80.9	80.9	80.0	0.00	0.00	0.00	±0.3
366400	81.0	81.0	80.1	81.0	81.0	80.1	0.00	0.00	0.00	±0.3
400000	81.3	81.3	80.3	81.3	81.3	80.3	0.00	0.00	0.00	±0.3
464000	81.9	81.9	80.8	81.9	81.9	80.8	0.00	0.00	0.00	±0.3
587800	82.1	82.1	81.0	82.2	82.1	81.0	0.01	0.00	0.00	±0.3
744200	82.1	82.1	81.0	82.1	82.1	80.9	0.00	0.00	−0.01	±0.3
942600	82.2	82.2	81.1	82.2	82.2	81.1	0.00	0.00	0.00	±0.3
1193600	82.4	82.4	81.1	82.4	82.4	81.1	0.00	0.00	0.00	±0.3
1511600	82.0	82.0	81.0	82.0	82.0	80.9	0.00	0.00	−0.01	±0.3
1914400	81.7	81.7	80.7	81.7	81.7	80.7	0.00	0.00	0.00	±0.3
2424400	81.5	81.5	80.6	81.5	81.5	80.6	0.00	0.00	0.00	±0.3
3070200	81.6	81.6	80.8	81.6	81.6	80.8	0.00	0.00	0.00	±0.3
3888000	81.8	81.8	80.9	81.8	81.8	80.9	0.00	0.00	0.00	±0.3
4000000	81.9	81.9	81.1	81.9	81.9	81.1	0.00	0.00	0.00	±0.3
4923800	82.5	82.5	81.7	82.4	82.5	81.7	−0.01	0.00	0.00	±0.3
6235400	83.6	83.6	82.5	83.6	83.6	82.5	0.00	0.00	0.00	±0.3
7896400	86.8	86.8	86.3	86.8	86.8	86.3	0.00	0.00	0.00	±0.3
10000000	94.4	94.4	93.8	94.4	94.4	93.7	0.00	0.00	−0.01	±0.3

SPEAG E-field frequency response tolerance criteria[1]:
±0.3dB for applied E-fields at calibration points from 3kHz to 10MHz

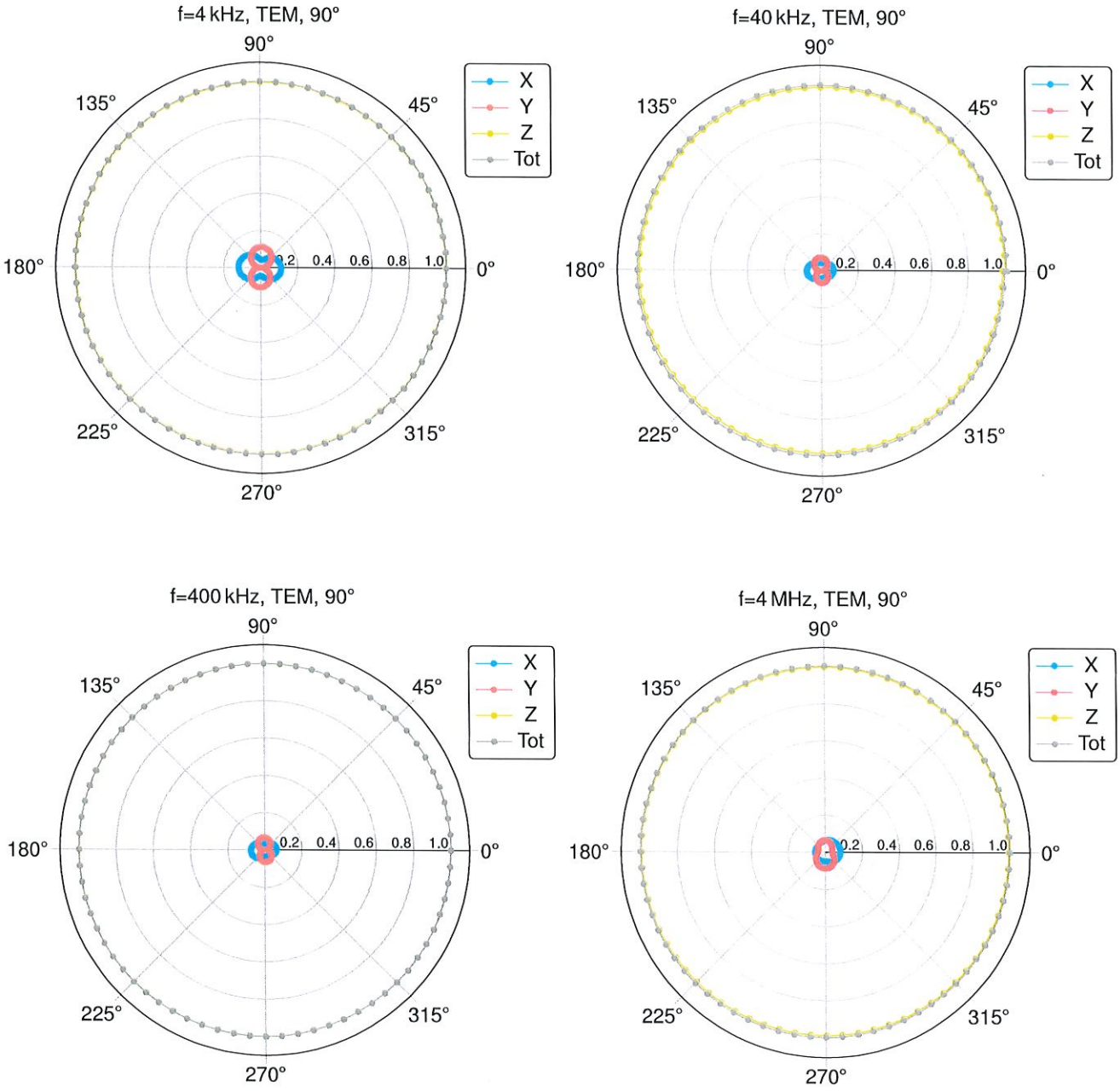
[1] Calibration uncertainty not taken into account (shared risk 50%).

Isotropy H-Field

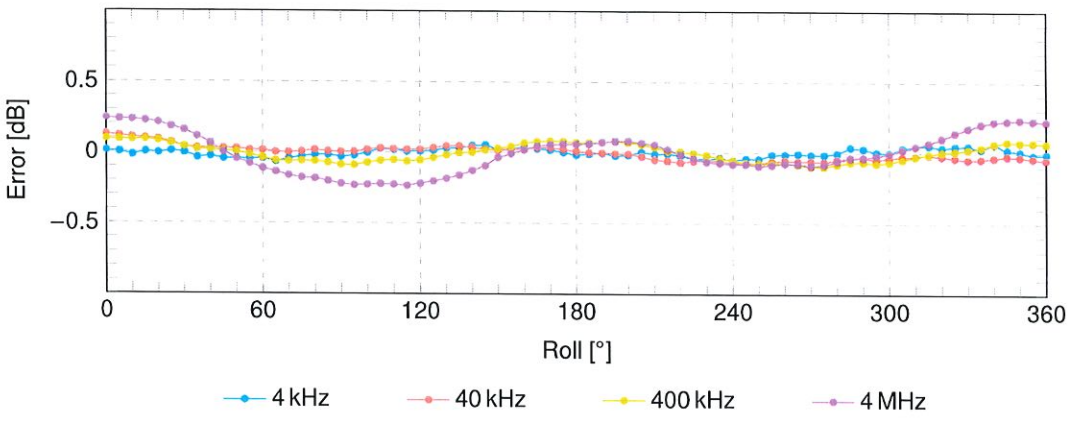
H-Field Receiving Pattern (ϕ), $\vartheta = 0°$



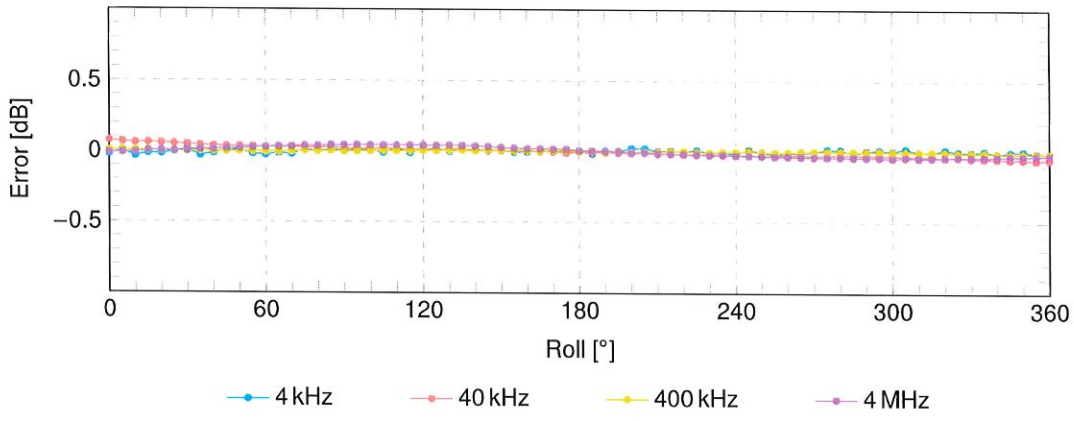
H-Field Receiving Pattern (ϕ), $\vartheta = 90°$



H-Field Receiving Pattern (ϕ), $\vartheta = 0°$



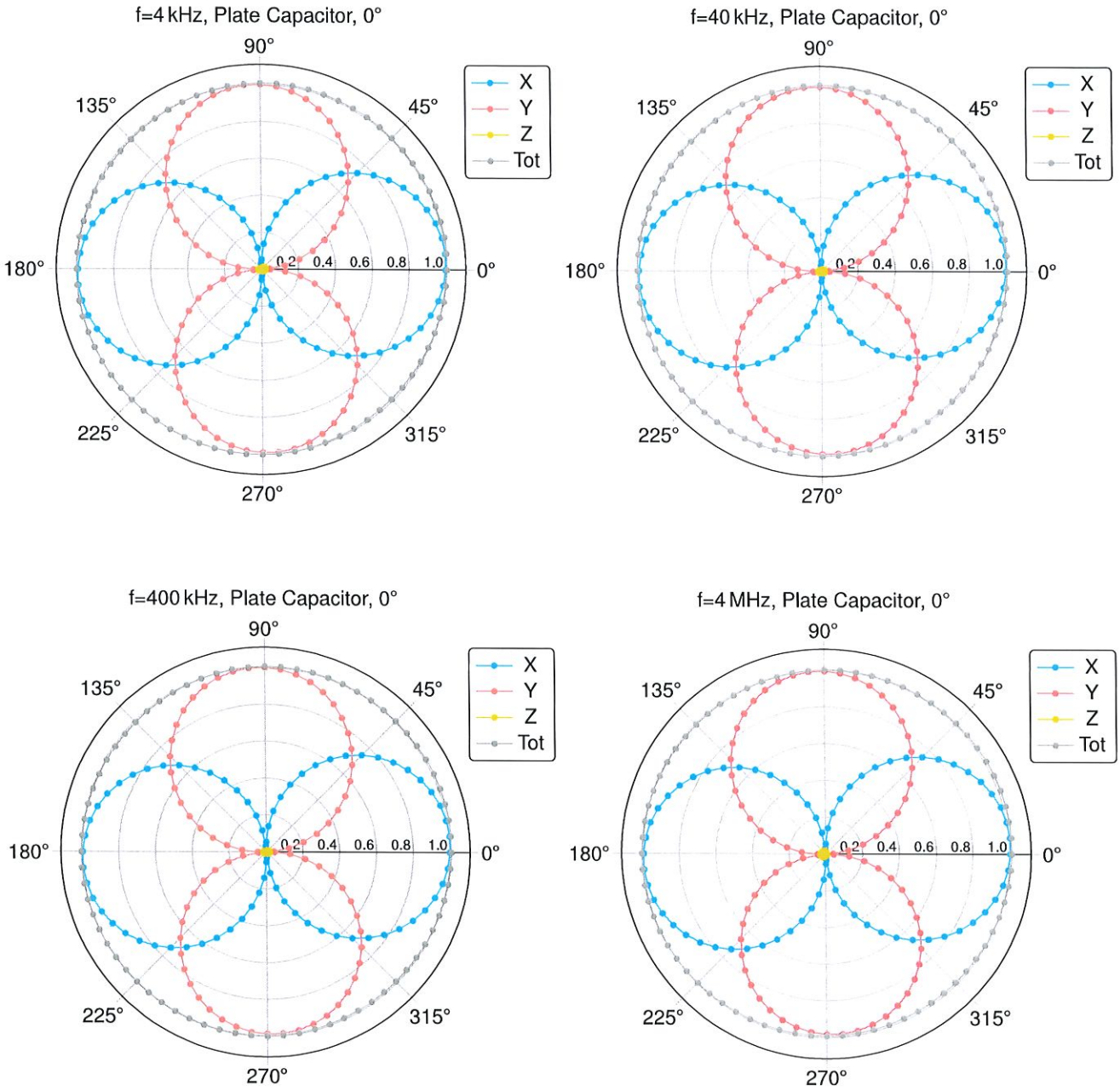
H-Field Receiving Pattern (ϕ), $\vartheta = 90°$



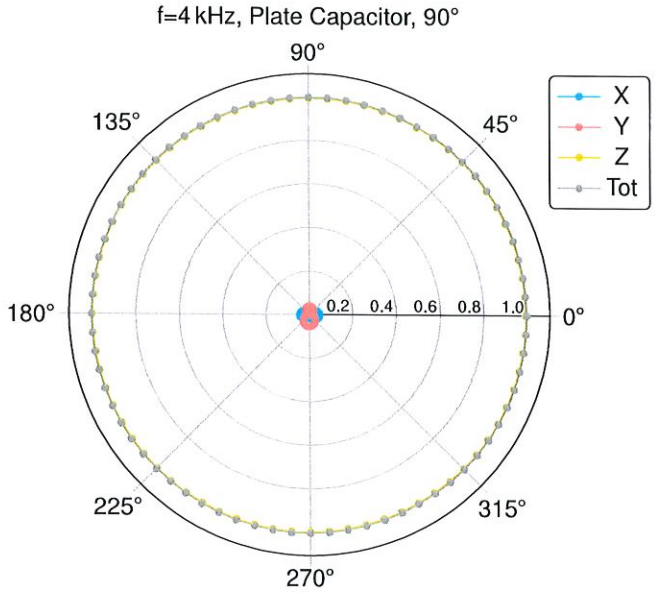
SPEAG axial deviation from the ideal response tolerance for H-field: ±0.6 dB

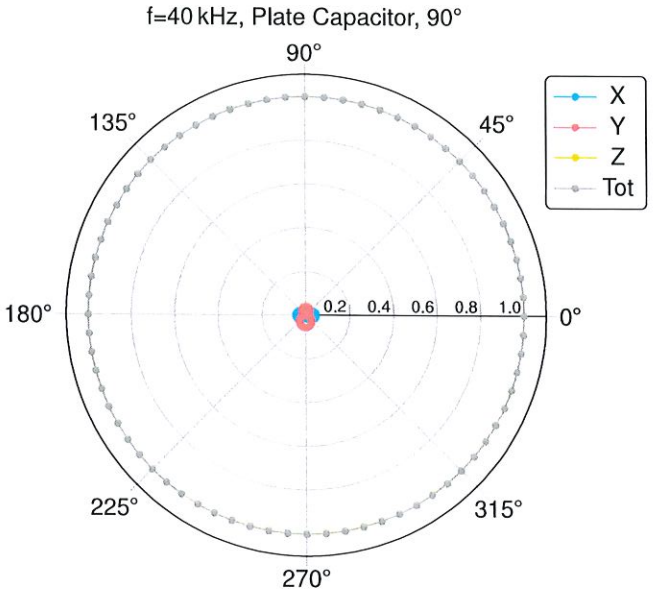
Isotropy E-Field

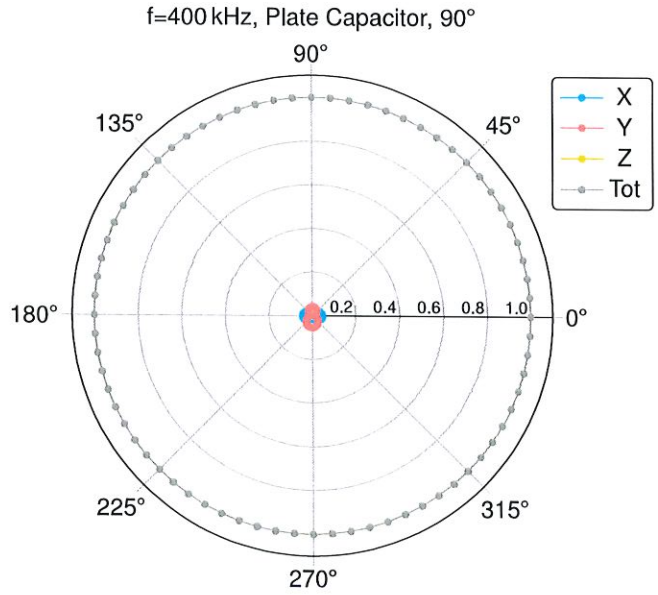
E-Field Receiving Pattern (ϕ), $\vartheta = 0°$

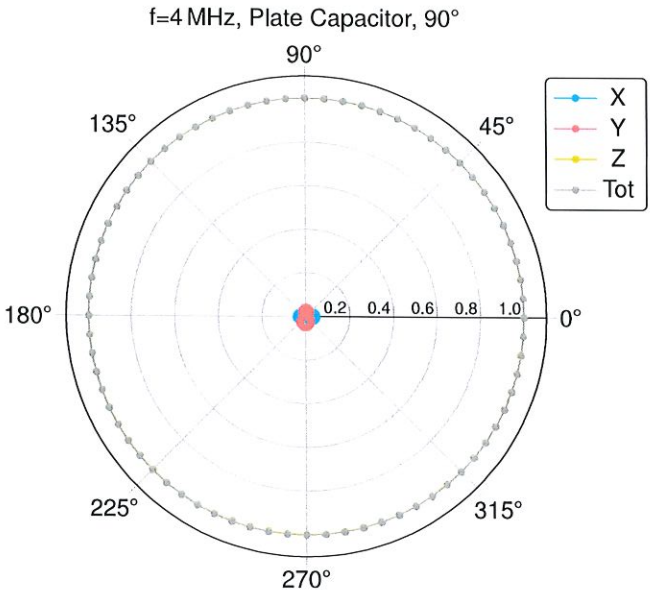


E-Field Receiving Pattern (ϕ), $\vartheta = 90°$

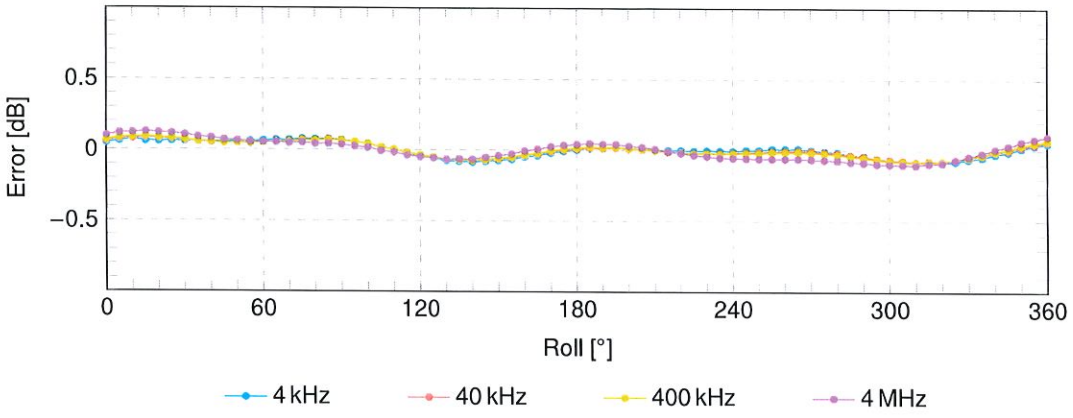




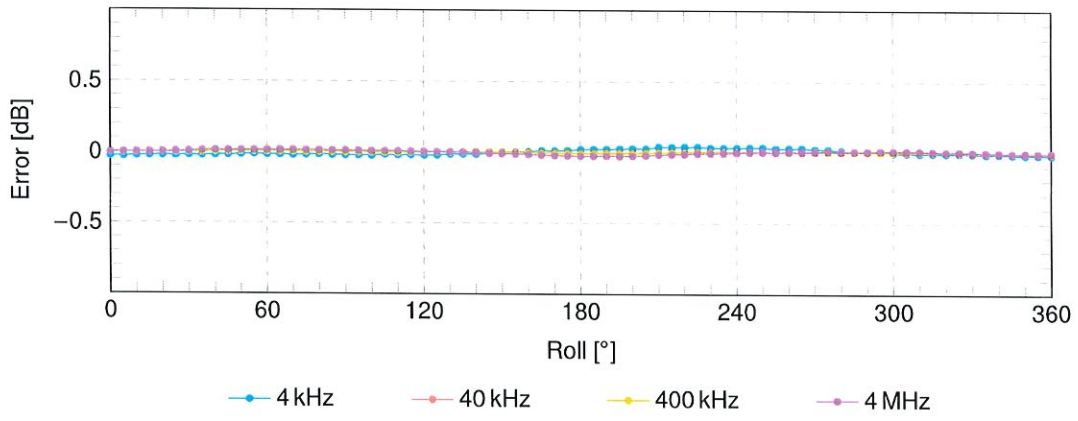




E-Field Receiving Pattern (ϕ), $\vartheta = 0°$



E-Field Receiving Pattern (ϕ), $\vartheta = 90°$



SPEAG axial deviation from the ideal response tolerance for E-field: ±0.8 dB

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CALIBRATION
CNAS L0570

Client **WSCT** **Certificate No: 24J02Z000487**

CALIBRATION CERTIFICATE

Object EX3DV4 - SN : 7391

Calibration Procedure(s) FF-Z11-004-02
Calibration Procedures for Dosimetric E-field Probes

Calibration date: August 29, 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±3)℃ and humidity<70%.
Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	19-Oct-23(CTTL, No.J23X11026)	Oct-24
Power sensor NRP8S	104291	19-Oct-23(CTTL, No.J23X11026)	Oct-24
Power sensor NRP8S	104292	19-Oct-23(CTTL, No.J23X11026)	Oct-24
Reference 10dBAttenuator	18N50W-10dB	19-Jan-23(CTTL, No.J23X00212)	Jan-25
Reference 20dBAttenuator	18N50W-20dB	19-Jan-23(CTTL, No.J23X00211)	Jan-25
Reference Probe EX3DV4	SN 7307	28-May-24(SPEAG, No.EX-7307_May24)	May-25
DAE4	SN 771	19-Jan-24(SPEAG, No.DAE4-771_Jan24)	Jan-25
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
SignalGenerator MG3700A	6201052605	12-Jun-24(CTTL, No.24J02X005419)	Jun-25
SignalGenerator APSIN26G	181-33A6D0700-1959	26-Mar-24(CTTL, No.24J02X002468)	Mar-25
Network Analyzer E5071C	MY46110673	25-Dec-23(CTTL, No.J23X13425)	Dec-24
Reference 10dBAttenuator	BT0520	11-May-23(CTTL, No.J23X04061)	May-25
Reference 20dBAttenuator	BT0267	11-May-23(CTTL, No.J23X04062)	May-25
OCP DAK-12	SN 1174	25-Oct-23(SPEAG, No.OCP-DAK12-1174_Oct23)	Oct-24

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Jun	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: September 07, 2024

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016

c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7391

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (*k*=2)
Norm(μV/(V/m)²)[A]	0.35	0.32	0.34	±10.0%
DCP(mV)[B]	101.8	106.3	99.8	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Dev.	Max Unc[E] (*k*=2)
0	CW	X	0.0	0.0	1.0	0.00	146.3	±2.7%	±4.7%
		Y	0.0	0.0	1.0		141.5		
		Z	0.0	0.0	1.0		143.2		
10352-AAA	Pulse Waveform (200Hz, 10%)	X	1.32	60.00	4.99	10.00	60	±5.2%	±9.6%
		Y	1.47	60.85	6.63		60		
		Z	1.31	60.00	5.20		60		
10353-AAA	Pulse Waveform (200Hz, 20%)	X	36.00	72.00	7.00	6.99	80	±4.2%	±9.6%
		Y	0.82	60.00	4.99		80		
		Z	14.00	70.00	7.00		80		
10354-AAA	Pulse Waveform (200Hz, 40%)	X	0.00	69.19	37.94	3.98	95	±4.6%	±9.6%
		Y	0.05	60.00	100.00		95		
		Z	0.00	69.91	38.60		95		
10355-AAA	Pulse Waveform (200Hz, 60%)	X	0.00	92.27	100.00	2.22	120	±5.5%	±9.6%
		Y	0.02	60.00	100.00		120		
		Z	0.00	90.64	99.97		120		
10387-AAA	QPSK Waveform, 1 MHz	X	20.00	126.25	38.29	1.00	150	±3.6%	±9.6%
		Y	20.00	123.70	37.08		150		
		Z	20.00	132.56	41.66		150		
10388-AAA	QPSK Waveform, 10 MHz	X	20.00	118.30	36.15	0.00	150	±3.3%	±9.6%
		Y	20.00	116.69	35.33		150		
		Z	20.00	121.31	37.90		150		
10396-AAA	64-QAM Waveform, 100 kHz	X	10.12	112.49	39.41	3.01	150	±2.2%	±9.6%
		Y	6.92	101.30	35.39		150		
		Z	20.00	130.56	45.18		150		
10414-AAA	WLAN CCDF, 64-QAM, 40MHz	X	5.24	69.75	18.68	0.00	150	±3.7%	±9.6%
		Y	5.14	69.21	18.25		150		
		Z	5.28	70.02	18.92		150		

Note: For details on UID parameters see Appendix

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%.

[A] The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 7391

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	31.12	230.42	36.27	4.26	0.00	4.90	0.00	0.17	1.02
Y	30.26	220.54	35.20	5.72	0.00	5.03	0.25	0.13	1.02
Z	30.51	224.99	36.20	5.41	0.00	4.93	0.28	0.15	1.02

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	118.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm