DASY/EASY - Parameters of Probe: EF3DV3 - SN:4060

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)	0.79	0.74	1.28	± 10.1 %
DCP (mV)[B]	95.3	97.8	96.5	

Calibration results for Frequency Response (30 MHz – 6 GHz)

Frequency MHz	Target E-Field V/m	Measured E-field (En) V/m	Deviation E-normal in %	Measured E-field (Ep) V/m	Deviation E-normal in %	Unc (k=2) %
30	77.2	77.3	0.1%	77.3	0.1%	± 5.1 %
100	77.3	78.2	1.2%	78.5	1.5%	± 5.1 %
450	77.1	78.1	1.2%	78.2	1.4%	± 5.1 %
600	77.2	77.7	0.6%	77.7	0.7%	± 5.1 %
750	77.3	77.4	0.3%	77.4	0.3%	± 5.1 %
1800	140.3	138.3	-2.8%	139.2	-2.1%	± 5.1 %
2000	133.0	131.4	-2.7%	131.4	-2.7%	± 5.1 %
2200	125.1	123.5	-3.3%	124.5	-2.5%	± 5.1 %
2500	123.7	122.4	-2.5%	123.2	-1.8%	± 5.1 %
3000	78.9	75.8	-4.6%	76.7	-3.4%	± 5.1 %
3500	250.5	247.6	-3.3%	243.6	-4.8%	± 5.1 %
3700	244.2	239.8	-3.9%	237.6	-4.8%	± 5.1 %
5200	50.8	51.3	1.1%	51.7	1.8%	± 5.1 %
5500	49.7	49.4	-0.6%	48.2	-3.1%	± 5.1 %
5800	48.9	48.6	-0.6%	49.7	1.7%	± 5.1 %

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%.

[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EF3DV3 - SN:4060

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	0.00	0.00	1.00	0.00	125.9	± 3.5 %	± 4.7 %
		Y	0.00	0.00	1.00		166.9		
		Z	0.00	0.00	1.00		128.4		
10352-AAA	Pulse Waveform (200Hz, 10%)	X	2.22	64.12	8.85	10.00	60.0	± 2.9 %	± 9.6 %
		Y	3.72	69.58	11.72		60.0		
		Z	2.68	66.15	10.03		60.0		
10353-AAA	Pulse Waveform (200Hz, 20%)	X	1.05	61.61	6.69	6.99	80.0	± 1.0 %	± 9.6 %
		Y	2.73	69.71	10.89		80.0		
		Z	1.39	64.06	8.17		80.0		
10354-AAA	Pulse Waveform (200Hz, 40%)	X	0.64	61.95	5.93	3.98	95.0	± 0.8 %	± 9.6 %
		Y	20.00	88.10	15.51		95.0		
		Z	1.00	65.44	7.85		95.0		
10355-AAA	Pulse Waveform (200Hz, 60%)	X	0.66	64.74	6.65	2.22	120.0	± 1.0 %	± 9.6 %
		Y	20.00	93.78	17.20		120.0		
		Z	20.00	84.41	12.55		120.0		
10387-AAA	QPSK Waveform, 1 MHz	X	1.98	70.59	17.17	1.00	150.0	± 1.9 %	± 9.6 %
		Y	1.94	69.99	16.92		150.0		
		Z	2.02	71.47	17.51		150.0		
10388-AAA	QPSK Waveform, 10 MHz	X	2.54	70.83	17.55	0.00	150.0	± 1.1 %	± 9.6 %
		Y	2.51	70.47	17.33		150.0		
		Z	2.43	70.41	17.43		150.0		
10396-AAA	64-QAM Waveform, 100 kHz	X	2.34	69.66	19.06	3.01	150.0	± 1.1 %	± 9.6 %
		Y	2.49	70.33	19.41		150.0		
		Z	2.09	67.16	17.82		150.0		
10399-AAA	64-QAM Waveform, 40 MHz	X	3.51	67.32	16.24	0.00	150.0	± 1.0 %	± 9.6 %
		Y	3.62	67.78	16.40		150.0		
		Z	3.52	67.45	16.34		150.0		
10414-AAA	WLAN CCDF, 64-QAM, 40MHz	X	4.74	65.60	15.79	0.00	150.0	± 2.0 %	± 9.6 %
		Y	4.72	65.49	15.68		150.0		
		Z	4.73	65.70	15.88		150.0		

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%.

[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EF3DV3 - SN:4060

Sensor Frequency Model Parameters

	Sensor X	Sensor Y	Sensor Z
Frequency Corr. (LF)	0.20	0.19	4.60
Frequency Corr. (HF)	2.82	2.82	2.82

Sensor Model Parameters

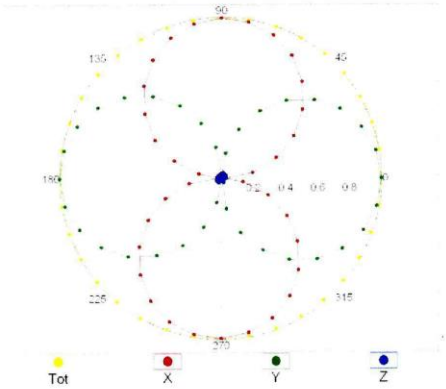
	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	39.4	262.85	37.46	5.11	0.07	4.93	0.89	0.00	1.00
Y	40.3	265.26	36.67	6.10	0.00	4.98	1.07	0.00	1.00
Z	37.4	250.57	37.84	4.63	0.03	4.97	0.00	0.14	1.00

Other Probe Parameters

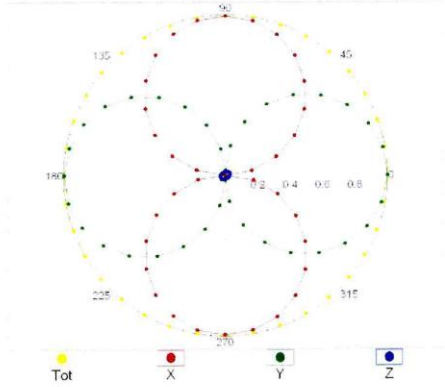
Sensor Arrangement	Rectangular
Connector Angle (°)	-35
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	12 mm
Tip Length	25 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	1.5 mm
Probe Tip to Sensor Y Calibration Point	1.5 mm
Probe Tip to Sensor Z Calibration Point	1.5 mm

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM,0°

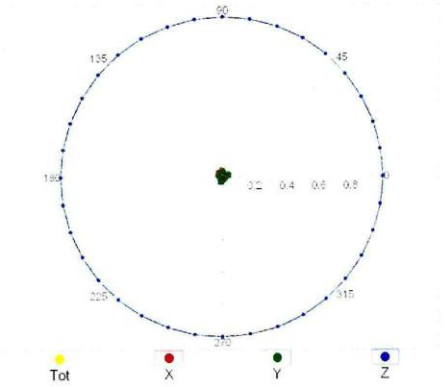


f=1800 MHz,R22,0°

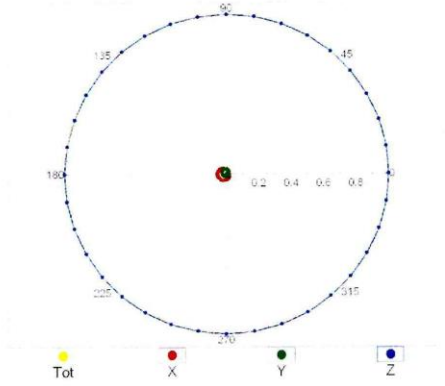


Receiving Pattern (ϕ), ϑ = 90°

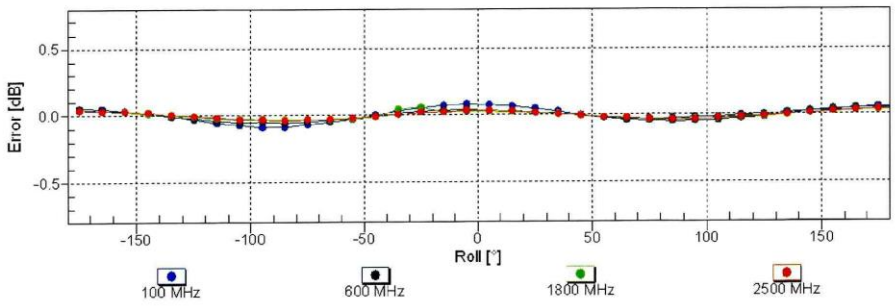
f=600 MHz,TEM,90°



f=1800 MHz,R22,90°

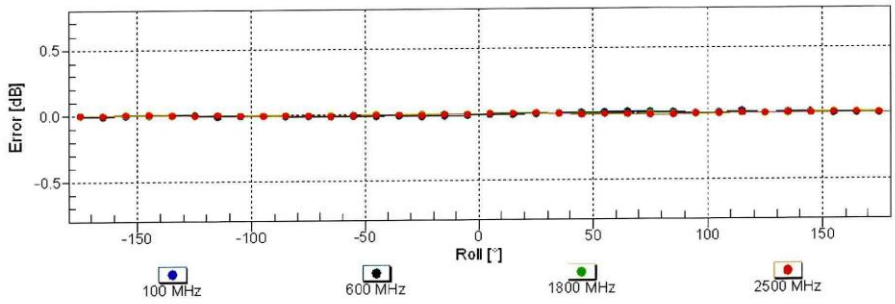


Receiving Pattern (ϕ), ϑ = 0°



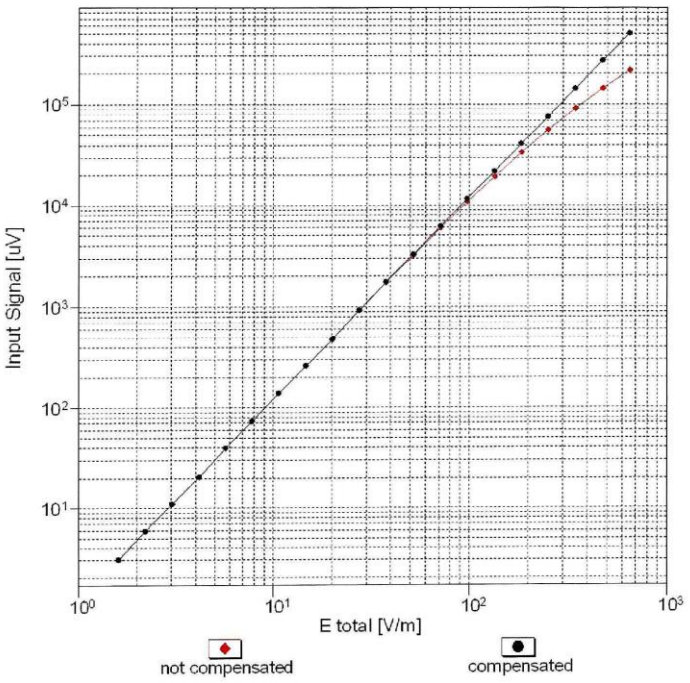
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

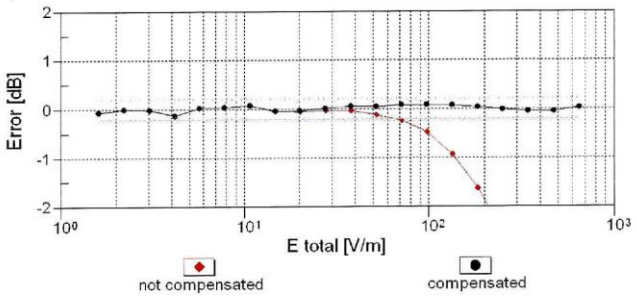
Receiving Pattern (ϕ), ϑ = 90°



Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(E-field)
(TEM cell, f = 900 MHz)

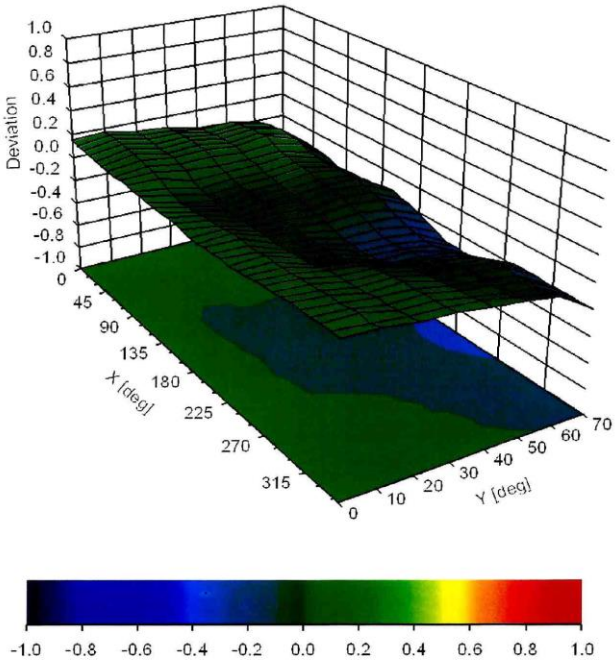




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Deviation from Isotropy in Air

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

ANNEX E DIPOLE CALIBRATION CERTIFICATE

Dipole 835 MHz

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client CTTL-BJ (Auden)

Certificate No: CD835V3-1023_Aug20

CALIBRATION CERTIFICATE

Object	CD835V3 - SN: 1023
Calibration procedure(s)	QA CAL-20.v7 Calibration Procedure for Validation Sources in air
Calibration date:	August 18, 2020

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
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: BH9394 (20k)	31-Mar-20 (No. 217-03106)	Apr-21
Type-N mismatch combination	SN: 310982 / 06327	31-Mar-20 (No. 217-03104)	Apr-21
Probe EF3DV3	SN: 4013	31-Dec-19 (No. EF3-4013_Dec19)	Dec-20
DAE4	SN: 781	27-Dec-19 (No. DAE4-781_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
Power sensor HP E4412A	SN: US38485102	05-Jan-10 (in house check Oct-17)	In house check: Oct-20
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
RF generator R&S SMT-06	SN: 837633/005	10-Jan-19 (in house check Jan-19)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

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

Issued: August 18, 2020

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

Certificate No: CD835V3-1023_Aug20 Page 1 of 5