Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.411 ± 0.02% (k=2)	403.452 ± 0.02% (k=2)	403.463 ± 0.02% (k=2)
Low Range	3.96158 ± 1.50% (k=2)	3.98747 ± 1.50% (k=2)	3.99174 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	113.5 ° ± 1 °

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200024.85	-8.32	-0.00
Channel X	+ Input	20005.36	0.39	0.00
Channel X	- Input	-20003.50	2.72	-0.01
Channel Y	+ Input	200030.06	-2.90	-0.00
Channel Y	+ Input	20004.14	-0.70	-0.00
Channel Y	- Input	-20008.00	-1.63	0.01
Channel Z	+ Input	200034.52	1.89	0.00
Channel Z	+ Input	20005.02	0.16	0.00
Channel Z	- Input	-20007.28	-0.87	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.94	0.03	0.00
Channel X	+ Input	200.94	0.01	0.01
Channel X	- Input	-198.93	0.16	-0.08
Channel Y	+ Input	2000.58	-0.17	-0.01
Channel Y	+ Input	199.97	-0.81	-0.40
Channel Y	- Input	-200.24	-0.99	0.50
Channel Z	+ Input	2000.83	0.21	0.01
Channel Z	+ Input	199.97	-0.67	-0.34
Channel Z	- Input	-199.90	-0.63	0.32

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	23.26	21.16
	- 200	-21.29	-22.70
Channel Y	200	-27.83	-28.04
	- 200	26.48	26.49
Channel Z	200	-11.47	-11.06
	- 200	9.80	9.70

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.92	-3.40
Channel Y	200	8.27	-	3.32
Channel Z	200	9.47	5.42	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15579	16774
Channel Y	16044	14871
Channel Z	16074	16518

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.87	-0.93	1.98	0.46
Channel Y	-0.62	-1.71	0.15	0.38
Channel Z	-0.46	-1.45	0.52	0.39

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	–0.01	-8	-9

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
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 **Sporton**

Certificate No: EX3-3935_May20

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3935
Calibration procedure(s)	QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes
Calibration date:	May 27, 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: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer 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: June 1, 2020

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

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.e., 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 ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect 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 with CW signal (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; Dx,y,z; VRx,y,z: A, B, C, D* 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values 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 ± 50 MHz to ± 100 MHz.
- *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).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3935

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.49	0.53	0.48	± 10.1 %
DCP (mV)[B]	102.6	103.2	102.3	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	137.0	± 3.3 %	± 4.7 %
		Y	0.0	0.0	1.0		150.1		
		Z	0.0	0.0	1.0		141.6		

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] 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: EX3DV4 - SN:3935

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	44.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3935

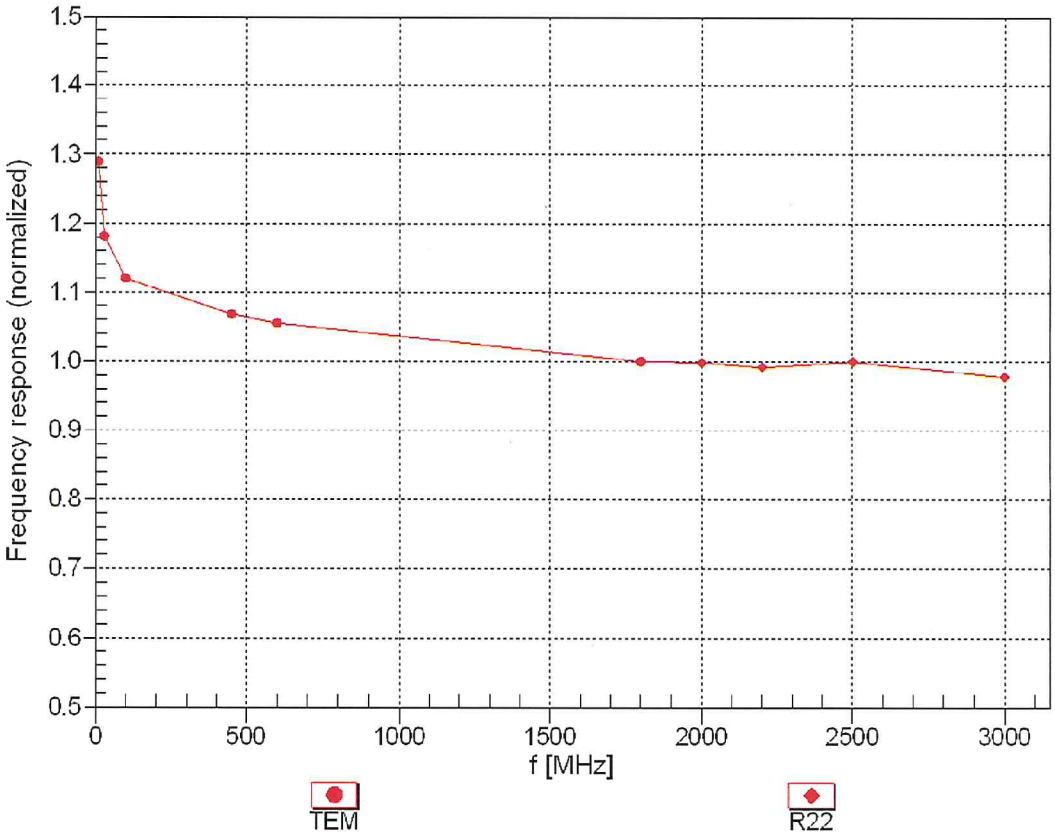
Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
750	41.9	0.89	10.58	10.58	10.58	0.57	0.80	± 12.0 %
835	41.5	0.90	10.31	10.31	10.31	0.38	0.93	± 12.0 %
900	41.5	0.97	10.16	10.16	10.16	0.40	0.88	± 12.0 %
1750	40.1	1.37	8.60	8.60	8.60	0.27	0.86	± 12.0 %
1900	40.0	1.40	8.35	8.35	8.35	0.24	0.86	± 12.0 %
2000	40.0	1.40	8.25	8.25	8.25	0.34	0.86	± 12.0 %
2300	39.5	1.67	7.86	7.86	7.86	0.35	0.90	± 12.0 %
2450	39.2	1.80	7.60	7.60	7.60	0.33	0.90	± 12.0 %
2600	39.0	1.96	7.43	7.43	7.43	0.37	0.90	± 12.0 %
5250	35.9	4.71	5.04	5.04	5.04	0.40	1.80	± 14.0 %
5600	35.5	5.07	4.76	4.76	4.76	0.40	1.80	± 14.0 %
5750	35.4	5.22	4.67	4.67	4.67	0.40	1.80	± 14.0 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[F] At frequencies up to 6 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Frequency Response of E-Field

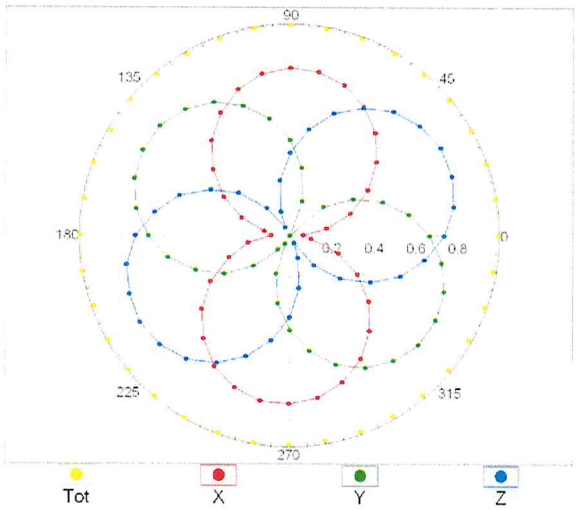
(TEM-Cell:ifi110 EXX, Waveguide: R22)



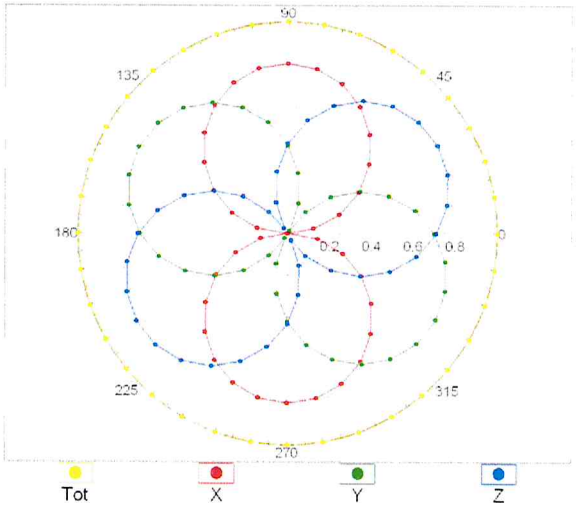
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

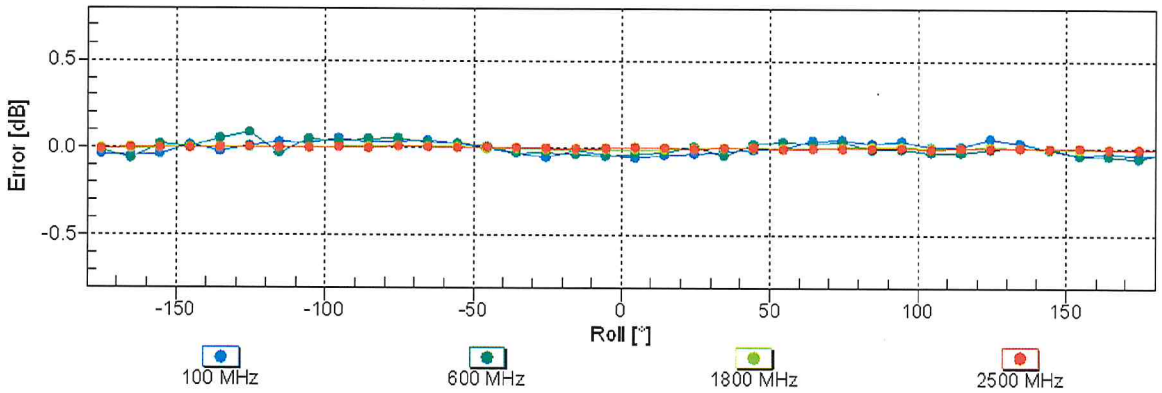
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22

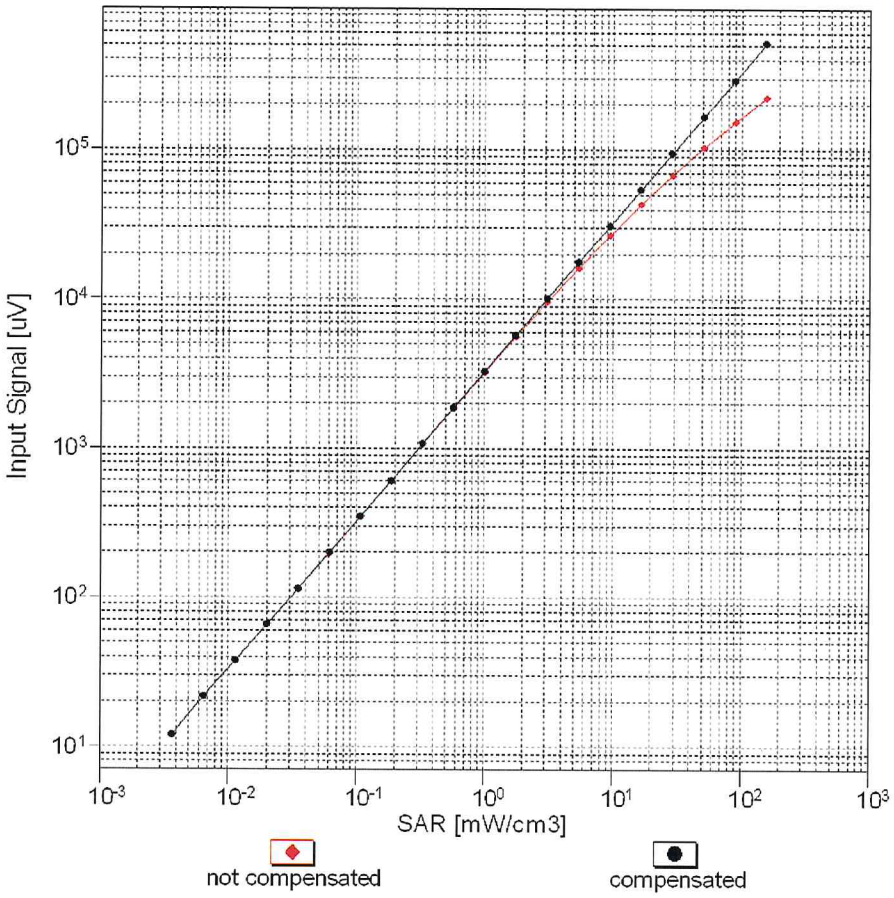


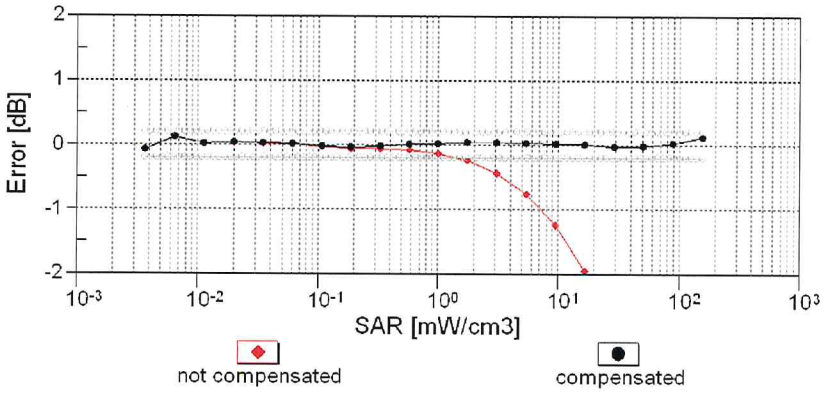


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

(TEM cell , f_{eval}= 1900 MHz)

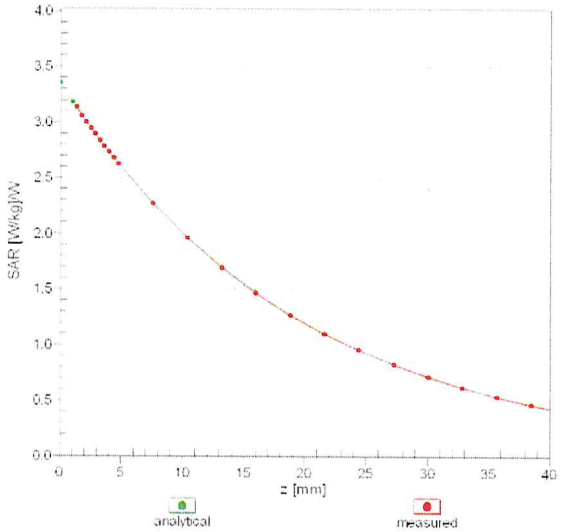




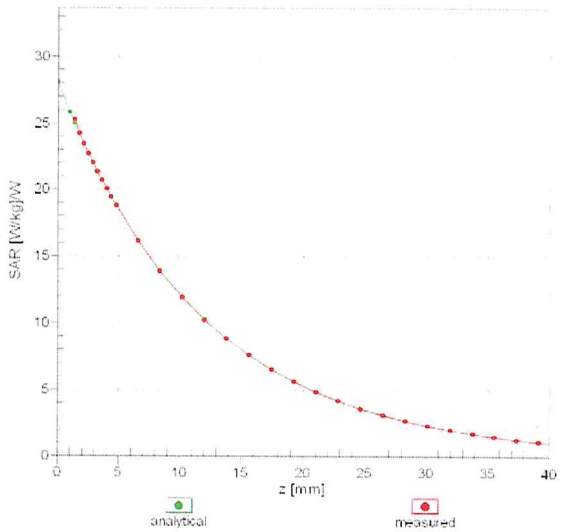
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

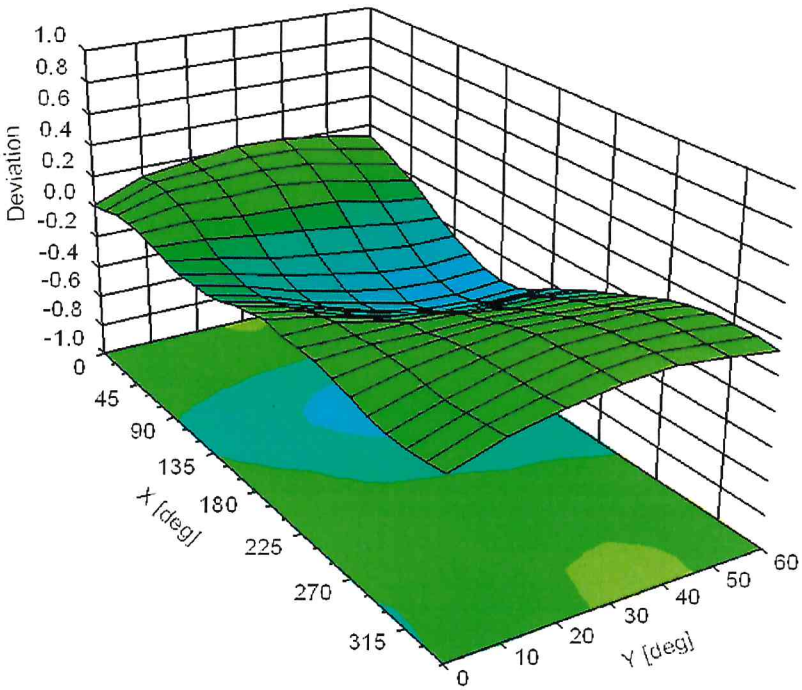


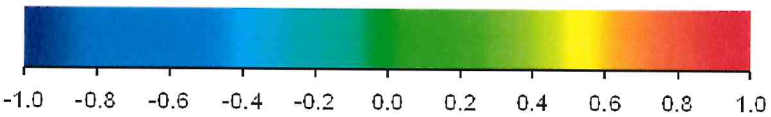
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





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

Appendix E. Conducted RF Output Power Table

The detailed power tables are shown as follows.

2.4GHz WLAN	Full Power Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	22.14	22.50	100.00
		6	2437	21.94	22.50	
		11	2462	22.03	22.50	
	802.11g 6Mbps	1	2412	21.03	21.50	97.49
		6	2437	20.62	21.50	
		11	2462	20.54	21.50	
	802.11n-HT20 MCS0	1	2412	19.75	20.50	97.31
		6	2437	19.43	20.50	
		11	2462	19.28	20.50	
	802.11n-HT40 MCS0	3	2422	20.08	20.50	92.78
		6	2437	19.87	20.50	
		9	2452	19.75	20.50	

2.4GHz WLAN	Sensor Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.38	16.00	100.00
		6	2437	15.03	16.00	
		11	2462	15.26	16.00	
	802.11g 6Mbps	1	2412	Not Required	16.00	97.49
		6	2437		16.00	
		11	2462		16.00	
	802.11n-HT20 MCS0	1	2412		16.00	97.31
		6	2437		16.00	
		11	2462		16.00	
	802.11n-HT40 MCS0	3	2422		15.00	92.78
		6	2437		15.00	
		9	2452		15.00	

5GHz WLAN	Full Power Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	16.19	17.00	97.47
		40	5200	16.10	17.00	
		44	5220	16.12	17.00	
		48	5240	16.08	17.00	
	802.11n-HT20 MCS0	36	5180	16.86	18.00	97.31
		40	5200	16.80	18.00	
		44	5220	16.51	18.00	
		48	5240	16.48	18.00	
	802.11n-HT40 MCS0	38	5190	19.45	20.50	95.13
		46	5230	19.90	20.50	
	802.11ac-VHT20 MCS0	36	5180	16.84	18.00	97.32
		40	5200	16.77	18.00	
		44	5220	16.39	18.00	
		48	5240	16.46	18.00	
	802.11ac-VHT40 MCS0	38	5190	18.71	19.00	94.77
		46	5230	18.48	19.00	
	802.11ac-VHT80 MCS0	42	5210	14.93	16.00	90.32

5GHz WLAN	Sensor Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	10.41	11.00	97.47
		40	5200	10.00	11.00	
		44	5220	10.05	11.00	
		48	5240	10.30	11.00	
	802.11n-HT20 MCS0	36	5180	Not Required	11.00	97.31
		40	5200		11.00	
		44	5220		11.00	
		48	5240		11.00	
	802.11n-HT40 MCS0	38	5190		10.00	95.13
		46	5230		10.00	
	802.11ac-VHT20 MCS0	36	5180		11.00	97.32
		40	5200		11.00	
		44	5220		11.00	
		48	5240		11.00	
	802.11ac-VHT40 MCS0	38	5190		10.00	94.77
		46	5230		10.00	
	802.11ac-VHT80 MCS0	42	5210		10.00	90.32

5GHz WLAN	Full Power Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	19.41	20.00	97.47
		56	5280	21.51	22.00	
		60	5300	19.80	21.00	
		64	5320	19.89	21.00	
	802.11n-HT20 MCS0	52	5260	19.76	21.00	97.31
		56	5280	20.25	21.00	
		60	5300	20.40	21.00	
		64	5320	20.46	21.00	
	802.11n-HT40 MCS0	54	5270	20.39	21.00	95.13
		62	5310	20.83	21.00	
	802.11ac-VHT20 MCS0	52	5260	18.34	19.50	97.32
		56	5280	18.73	19.50	
		60	5300	18.64	19.50	
		64	5320	18.82	19.50	
	802.11ac-VHT40 MCS0	54	5270	18.94	19.50	94.77
		62	5310	19.17	19.50	
	802.11ac-VHT80 MCS0	58	5290	17.84	18.50	90.32

5GHz WLAN	Sensor Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	10.49	11.00	97.47
		56	5280	10.31	11.00	
		60	5300	10.39	11.00	
		64	5320	10.32	11.00	
	802.11n-HT20 MCS0	52	5260	Not Required	11.00	97.31
		56	5280		11.00	
		60	5300		11.00	
		64	5320		11.00	
	802.11n-HT40 MCS0	54	5270		10.00	95.13
		62	5310		10.00	
	802.11ac-VHT20 MCS0	52	5260		11.00	97.32
		56	5280		11.00	
		60	5300		11.00	
		64	5320		11.00	
	802.11ac-VHT40 MCS0	54	5270		10.00	94.77
		62	5310		10.00	
	802.11ac-VHT80 MCS0	58	5290		10.00	90.32

5GHz WLAN	Full Power Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	19.97	21.00	97.47
		116	5580	20.36	21.50	
		132	5660	21.04	21.50	
		140	5700	20.62	21.50	
	802.11n-HT20 MCS0	100	5500	19.60	20.50	97.31
		116	5580	19.90	20.50	
		132	5660	19.92	20.50	
		140	5700	19.23	20.50	
	802.11n-HT40 MCS0	102	5510	20.00	20.50	95.13
		110	5550	20.31	20.50	
		134	5670	19.73	20.50	
	802.11ac-VHT20 MCS0	100	5500	18.20	19.00	97.32
		116	5580	18.21	19.00	
		132	5660	18.15	19.00	
		140	5700	17.75	19.00	
	802.11ac-VHT40 MCS0	102	5510	18.48	19.00	94.77
		110	5550	18.85	19.00	
		134	5670	18.47	19.00	
	802.11ac-VHT80 MCS0	106	5530	17.33	18.00	90.32

5GHz WLAN	Sensor Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	11.52	12.00	97.47
		116	5580	11.59	12.00	
		132	5660	11.51	12.00	
		140	5700	11.27	12.00	
	802.11n-HT20 MCS0	100	5500	Not Required	12.00	97.31
		116	5580		12.00	
		132	5660		12.00	
		140	5700		12.00	
	802.11n-HT40 MCS0	102	5510		11.00	95.13
		110	5550		11.00	
		134	5670		11.00	
	802.11ac-VHT20 MCS0	100	5500		12.00	97.32
		116	5580		12.00	
		132	5660		12.00	
		140	5700		12.00	
	802.11ac-VHT40 MCS0	102	5510		11.00	94.77
		110	5550		11.00	
		134	5670		11.00	
	802.11ac-VHT80 MCS0	106	5530		11.00	90.32

5GHz WLAN	Full Power Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	20.87	21.50	97.47
		157	5785	20.52	21.50	
		165	5825	20.44	21.50	
	802.11n-HT20 MCS0	149	5745	19.57	20.50	97.31
		157	5785	19.44	20.50	
		165	5825	19.23	20.50	
	802.11n-HT40 MCS0	151	5755	19.84	20.50	95.13
		159	5795	19.71	20.50	
	802.11ac-VHT20 MCS0	149	5745	18.07	19.00	97.32
		157	5785	18.02	19.00	
		165	5825	17.78	19.00	
	802.11ac-VHT40 MCS0	151	5755	18.37	19.00	94.77
		159	5795	18.42	19.00	
	802.11ac-VHT80 MCS0	155	5775	16.73	18.00	90.32

5GHz WLAN	Sensor Ant 1+2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	11.80	12.50	97.47
		157	5785	10.03	10.50	
		165	5825	10.15	10.50	
	802.11n-HT20 MCS0	149	5745	Not Required	10.50	97.31
		157	5785		10.50	
		165	5825		10.50	
	802.11n-HT40 MCS0	151	5755		10.50	95.13
		159	5795		10.50	
	802.11ac-VHT20 MCS0	149	5745		10.50	97.32
		157	5785		10.50	
		165	5825		10.50	
	802.11ac-VHT40 MCS0	151	5755		10.50	94.77
		159	5795		10.50	
	802.11ac-VHT80 MCS0	155	5775		10.50	90.32

5GHz WLAN	Full Power Ant 1					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
WLAN	802.11ac-VHT80 MCS0	42+106	5210+5530	10.23	11.00	86.02
		42+155	5210+5775	10.07	11.00	
		58+106	5290+5530	10.46	11.00	
		58+155	5290+5775	10.45	11.00	
		106+155	5530+5775	10.93	11.00	

5GHz WLAN	Full Power Ant 2					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
WLAN	802.11ac-VHT80 MCS0	42+106	5210+5530	10.10	10.50	86.95
		42+155	5210+5775	8.93	10.50	
		58+106	5290+5530	10.15	10.50	
		58+155	5290+5775	8.78	10.50	
		106+155	5530+5775	8.82	10.50	

BR / EDR

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	11.69	9.01	9.24
	CH 39	2441	11.29	8.87	8.30
	CH 78	2480	11.81	9.52	9.57
Tune-up Limit			12	10	10

LE 4.0

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	7.33
	CH 19	2440	6.42
	CH 39	2480	7.74
Tune-up Limit			8

LE 5.0

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	7.46	
	CH 19	2440	6.50	
	CH 39	2480	7.88	
Tune-up Limit			8	