

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3819

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	10.00	10.00	10.00	0.42	1.05	± 12.0 %
835	41.5	0.90	9.57	9.57	9.57	0.55	0.89	± 12.0 %
900	41.5	0.97	9.43	9.43	9.43	0.41	1.05	± 12.0 %
1450	40.5	1.20	8.68	8.68	8.68	0.29	0.80	± 12.0 %
1750	40.1	1.37	8.54	8.54	8.54	0.40	0.89	± 12.0 %
1900	40.0	1.40	8.27	8.27	8.27	0.23	0.99	± 12.0 %
2000	40.0	1.40	8.20	8.20	8.20	0.35	0.86	± 12.0 %
2300	39.5	1.67	7.64	7.64	7.64	0.37	0.86	± 12.0 %
2450	39.2	1.80	7.21	7.21	7.21	0.34	0.92	± 12.0 %
2600	39.0	1.96	7.06	7.06	7.06	0.38	0.89	± 12.0 %
3300	38.2	2.71	6.91	6.91	6.91	0.29	1.20	± 14.0 %
3500	37.9	2.91	6.89	6.89	6.89	0.25	1.20	± 14.0 %
3700	37.7	3.12	6.67	6.67	6.67	0.25	1.25	± 14.0 %
5250	35.9	4.71	5.07	5.07	5.07	0.40	1.80	± 14.0 %
5600	35.5	5.07	4.70	4.70	4.70	0.40	1.80	± 14.0 %
5750	35.4	5.22	4.77	4.77	4.77	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 below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. 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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3819

Calibration Parameter Determined in Body Tissue Simulating Media

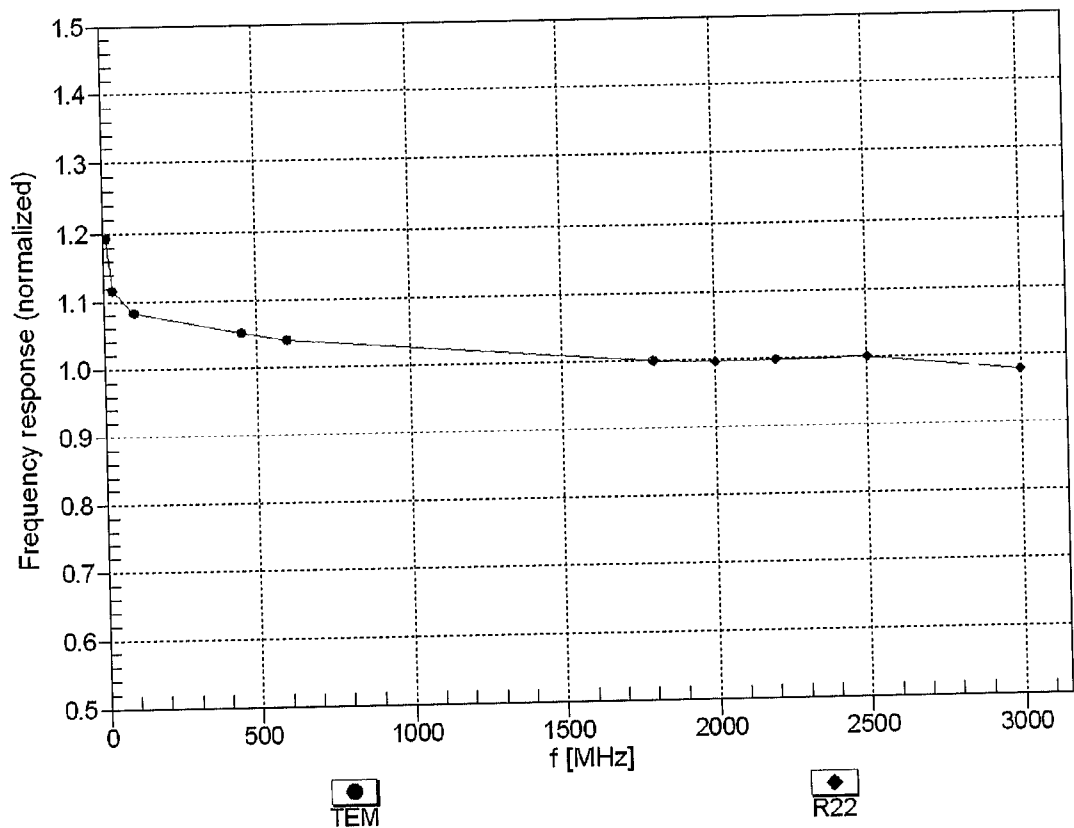
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	55.5	0.96	9.68	9.68	9.68	0.69	0.80	± 12.0 %
835	55.2	0.97	9.40	9.40	9.40	0.49	0.97	± 12.0 %
900	55.0	1.05	9.36	9.36	9.36	0.50	0.92	± 12.0 %
1750	53.4	1.49	8.06	8.06	8.06	0.33	0.85	± 12.0 %
1900	53.3	1.52	7.66	7.66	7.66	0.25	1.11	± 12.0 %
2300	52.9	1.81	7.49	7.49	7.49	0.32	0.96	± 12.0 %
2450	52.7	1.95	7.32	7.32	7.32	0.37	0.89	± 12.0 %
2600	52.5	2.16	7.04	7.04	7.04	0.34	0.95	± 12.0 %
3300	51.6	3.08	6.60	6.60	6.60	0.28	1.20	± 14.0 %
3500	51.3	3.31	6.57	6.57	6.57	0.25	1.20	± 14.0 %
3700	51.0	3.55	6.37	6.37	6.37	0.30	1.25	± 14.0 %
5250	48.9	5.36	4.46	4.46	4.46	0.50	1.90	± 14.0 %
5600	48.5	5.77	3.92	3.92	3.92	0.50	1.90	± 14.0 %
5750	48.3	5.94	4.07	4.07	4.07	0.50	1.90	± 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 below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. 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.

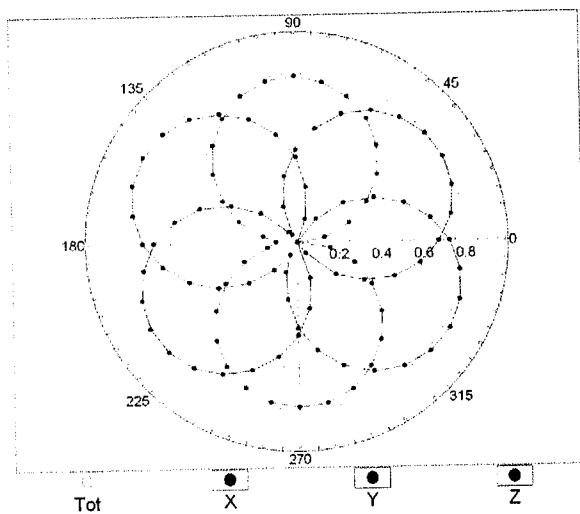
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



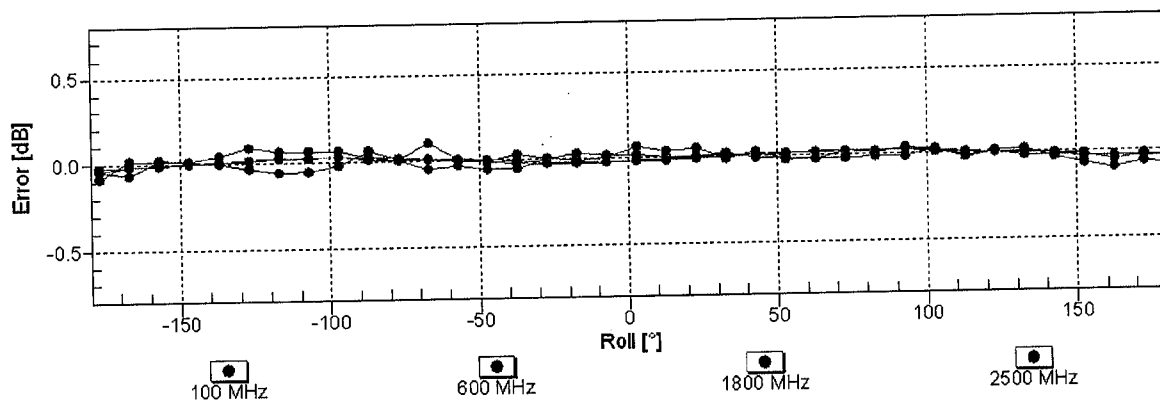
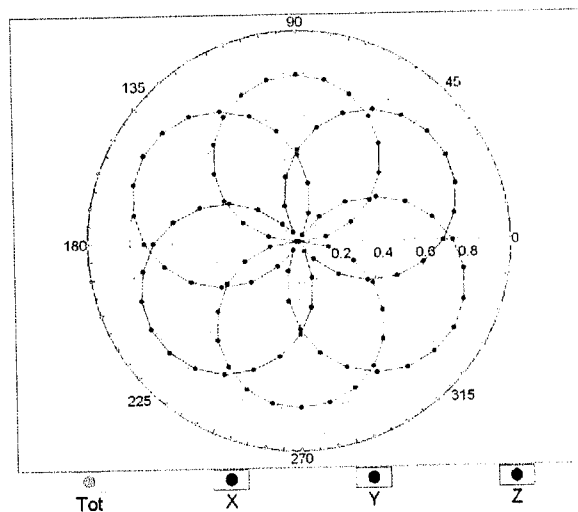
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

f=600 MHz,TEM

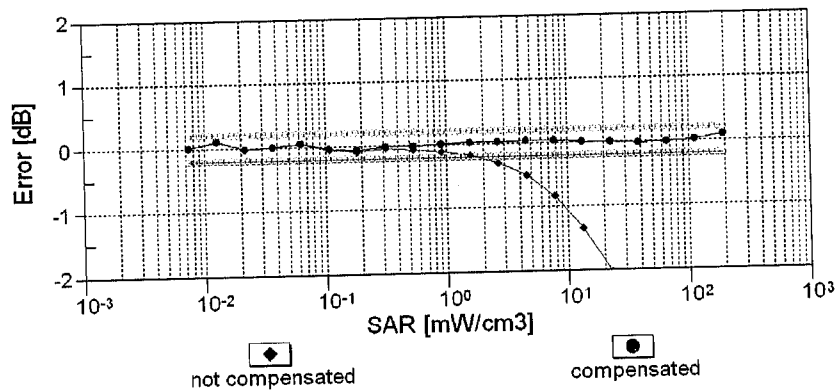
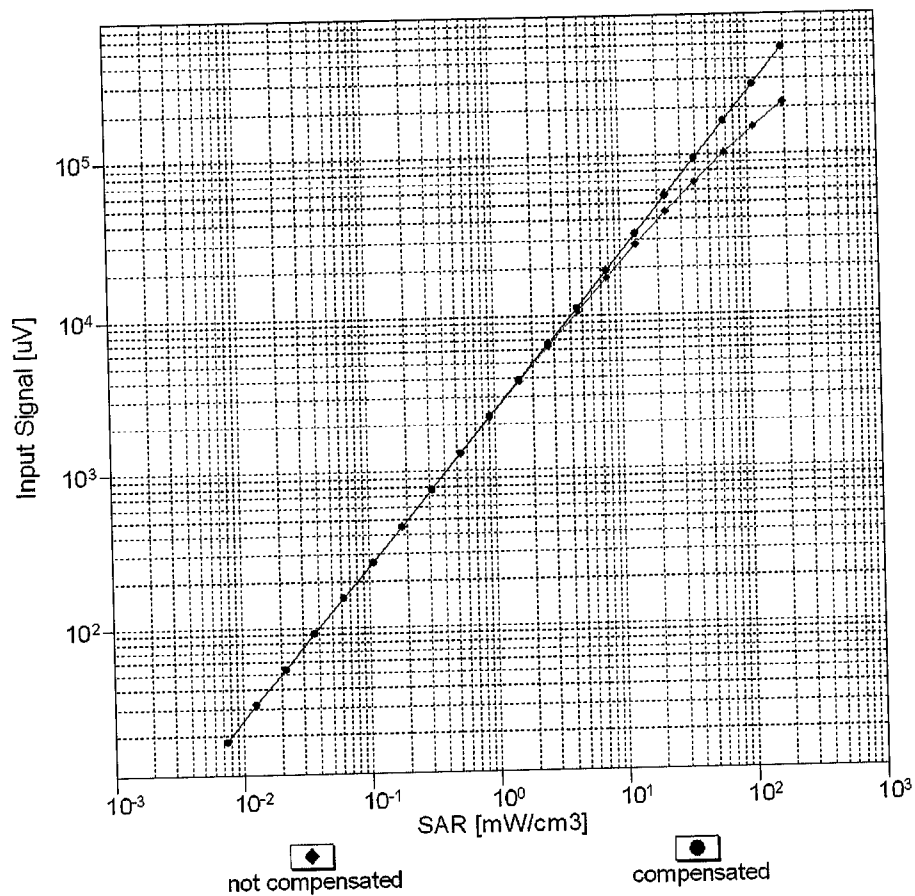


f=1800 MHz,R22



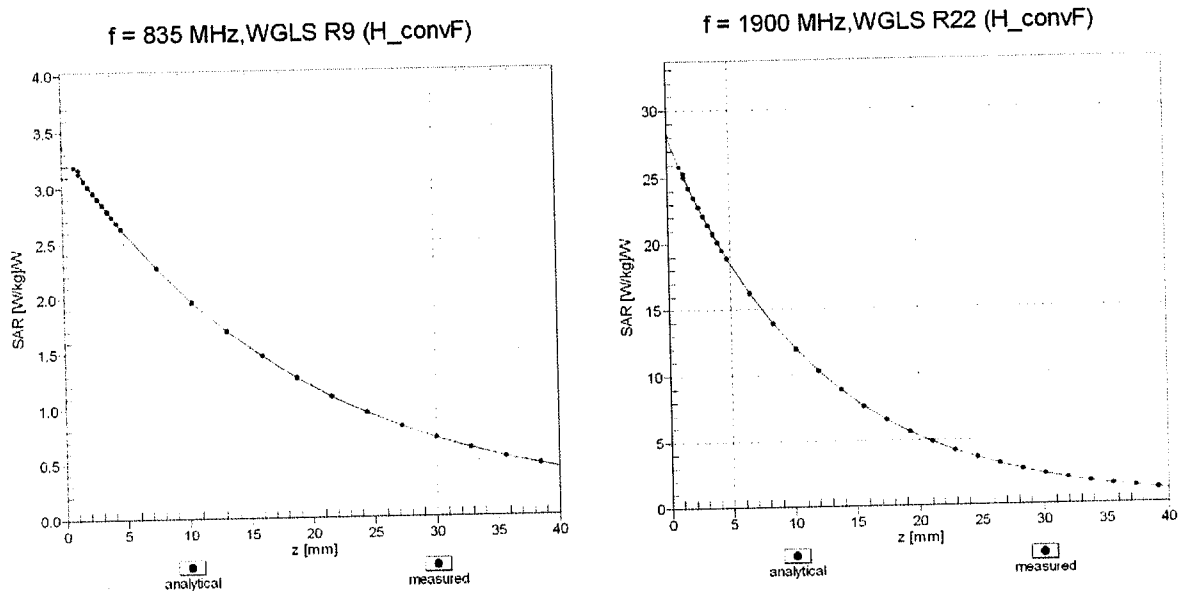
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$
(TEM cell , $f_{\text{eval}} = 1900 \text{ MHz}$)

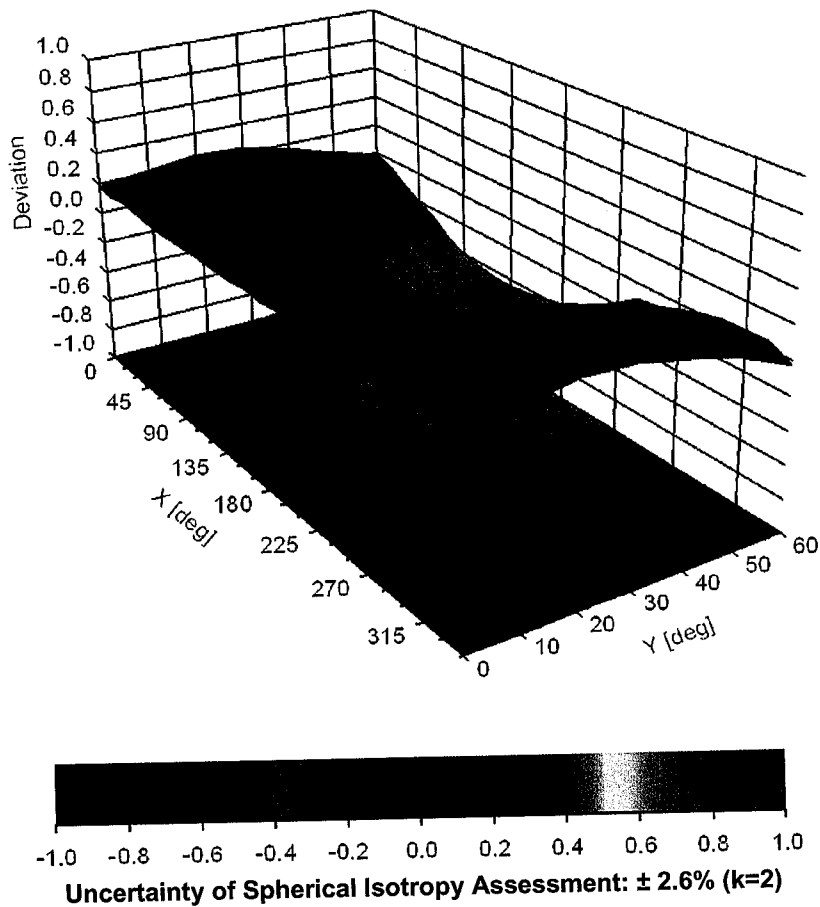


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, θ), f = 900 MHz





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Multilateral Agreement for the recognition of calibration certificates

Client **Sporton**

Certificate No: **EX3-3935_Nov18**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3935**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes**

Calibration date: **November 26, 2018**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
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-18)	In house check: Oct-19

Calibrated by:	Name	Function	Signature
	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
			Issued: November 27, 2018
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			



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Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ 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:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,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.
- DCP_{x,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
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,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 $f \leq 800$ 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 NORM_{x,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 NORM_x (no uncertainty required).

Probe EX3DV4

SN:3935

Manufactured: July 24, 2013
Calibrated: November 26, 2018

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.48	0.52	0.47	$\pm 10.1 \%$
DCP (mV) ^B	107.8	103.4	108.1	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	184.3	$\pm 3.0 \%$
		Y	0.0	0.0	1.0		192.9	
		Z	0.0	0.0	1.0		188.3	

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 Pages 5 and 6).

^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

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	10.83	10.83	10.83	0.54	0.80	± 12.0 %
835	41.5	0.90	10.48	10.48	10.48	0.50	0.80	± 12.0 %
900	41.5	0.97	10.38	10.38	10.38	0.50	0.85	± 12.0 %
1750	40.1	1.37	8.91	8.91	8.91	0.39	0.85	± 12.0 %
1900	40.0	1.40	8.50	8.50	8.50	0.28	0.85	± 12.0 %
2000	40.0	1.40	8.33	8.33	8.33	0.32	0.84	± 12.0 %
2300	39.5	1.67	7.99	7.99	7.99	0.26	0.96	± 12.0 %
2450	39.2	1.80	7.69	7.69	7.69	0.39	0.82	± 12.0 %
2600	39.0	1.96	7.38	7.38	7.38	0.32	0.98	± 12.0 %

^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. Above 5 GHz frequency validity can be extended to ± 110 MHz.

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^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.

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

Calibration Parameter Determined in Body 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	55.5	0.96	10.72	10.72	10.72	0.53	0.81	± 12.0 %
835	55.2	0.97	10.41	10.41	10.41	0.49	0.80	± 12.0 %
1750	53.4	1.49	8.45	8.45	8.45	0.41	0.80	± 12.0 %
1900	53.3	1.52	8.07	8.07	8.07	0.41	0.81	± 12.0 %
2300	52.9	1.81	7.86	7.86	7.86	0.35	0.86	± 12.0 %
2450	52.7	1.95	7.68	7.68	7.68	0.35	0.89	± 12.0 %
2600	52.5	2.16	7.52	7.52	7.52	0.29	0.99	± 12.0 %

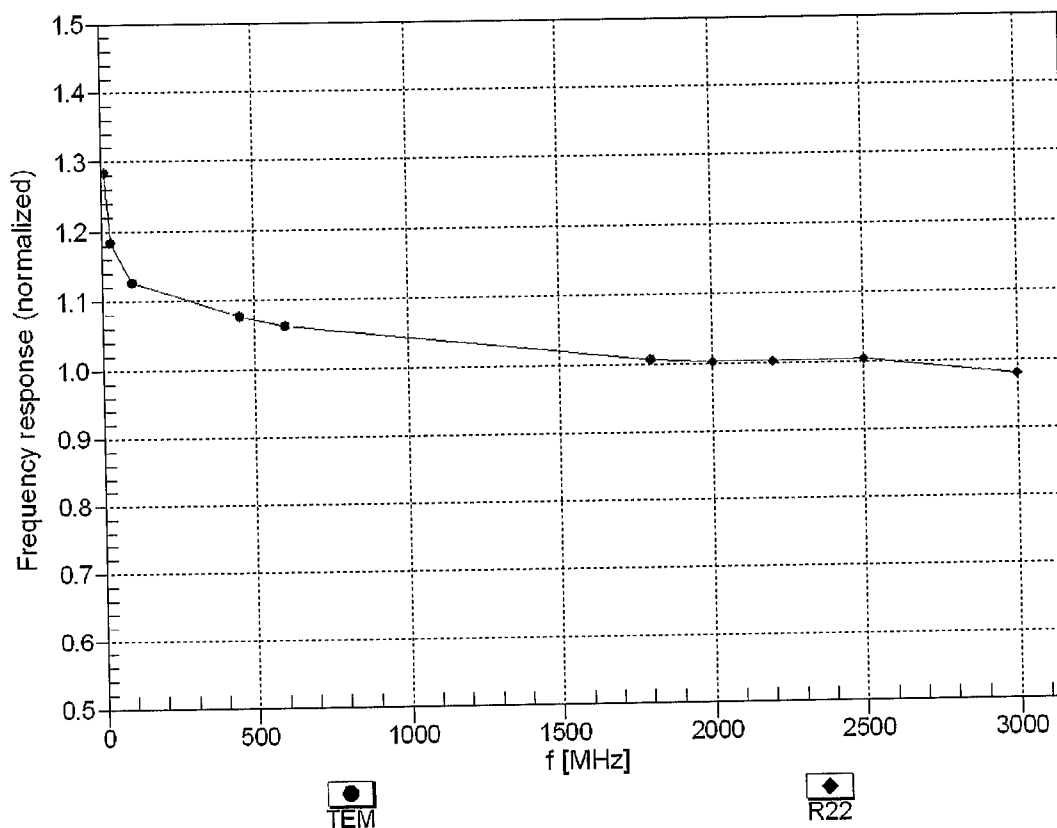
^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

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Frequency Response of E-Field

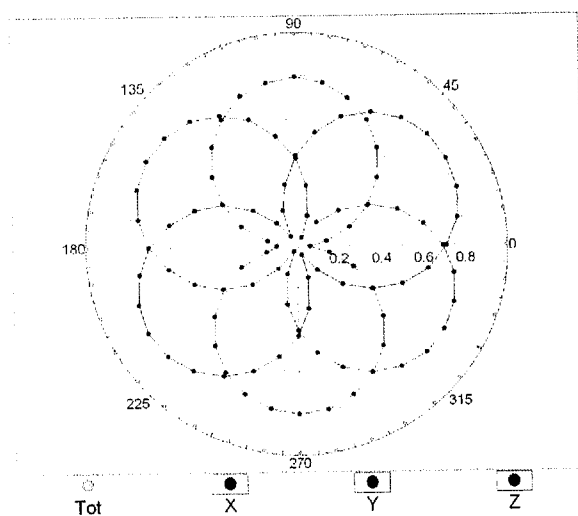
(TEM-Cell:ifi110 EXX, Waveguide: R22)



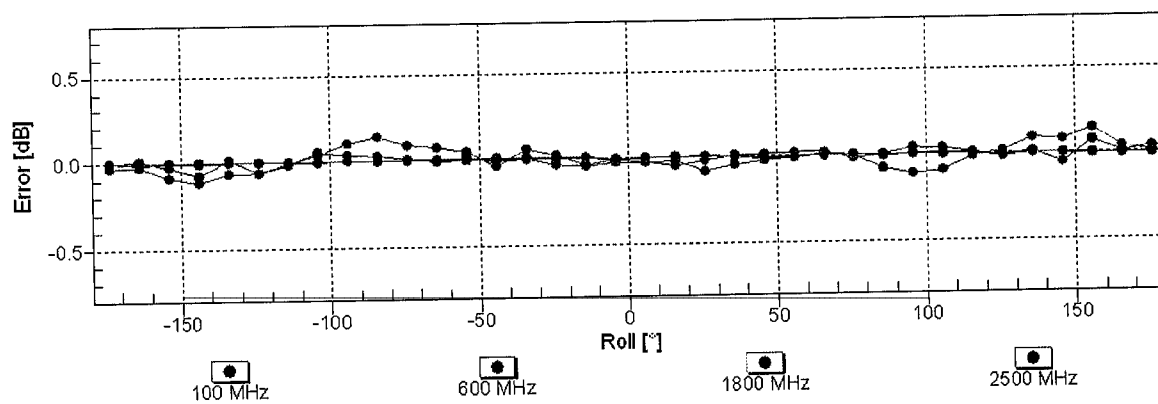
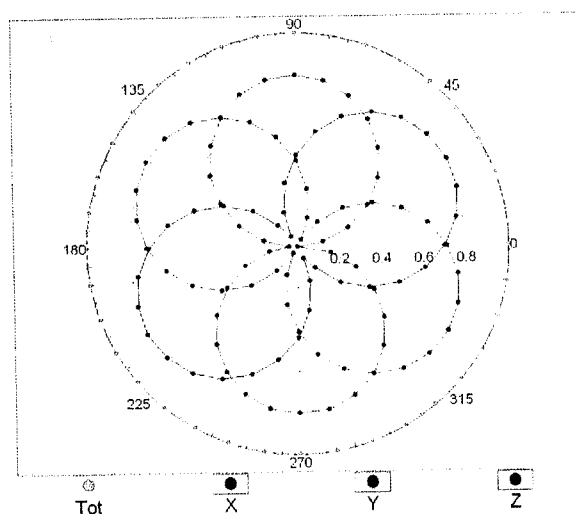
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\theta = 0^\circ$

f=600 MHz,TEM

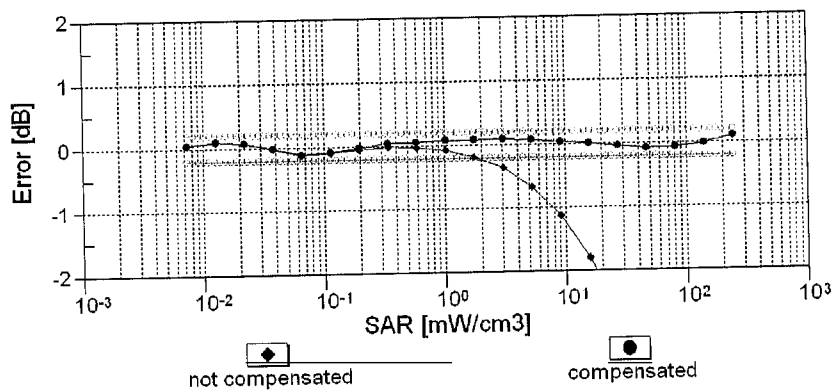
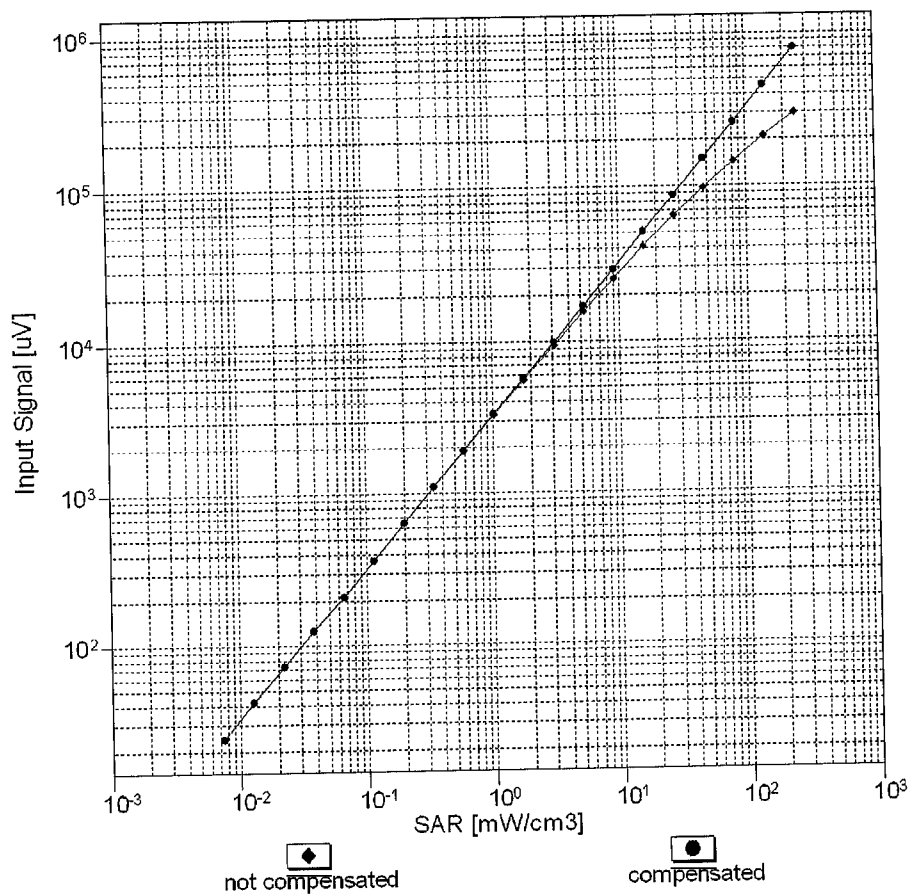


f=1800 MHz,R22



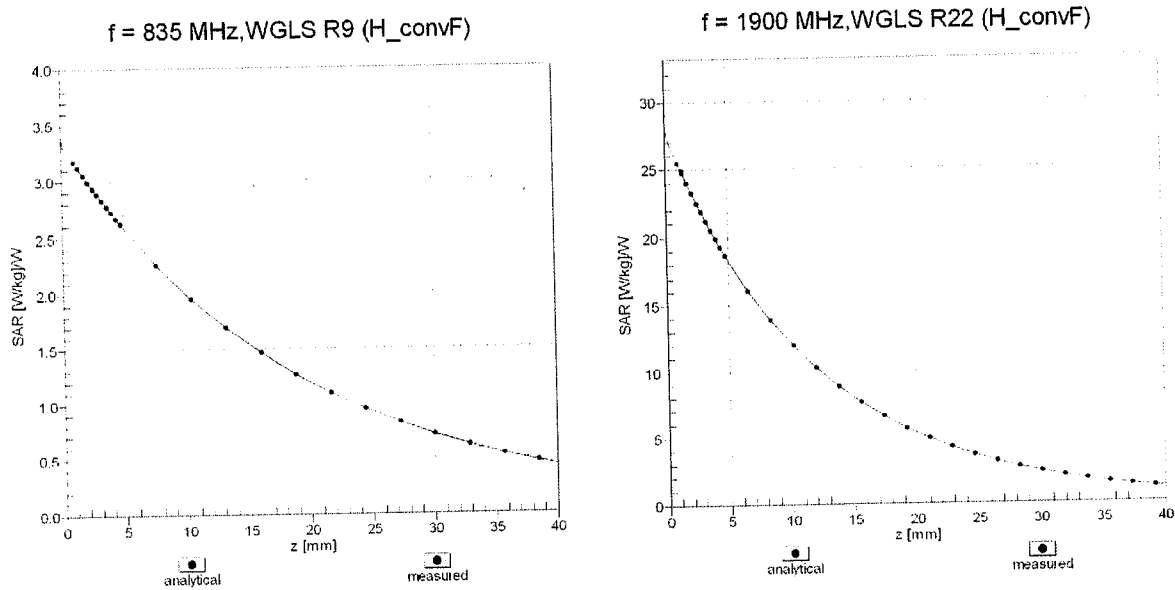
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell , $f_{\text{eval}} = 1900 \text{ MHz}$)

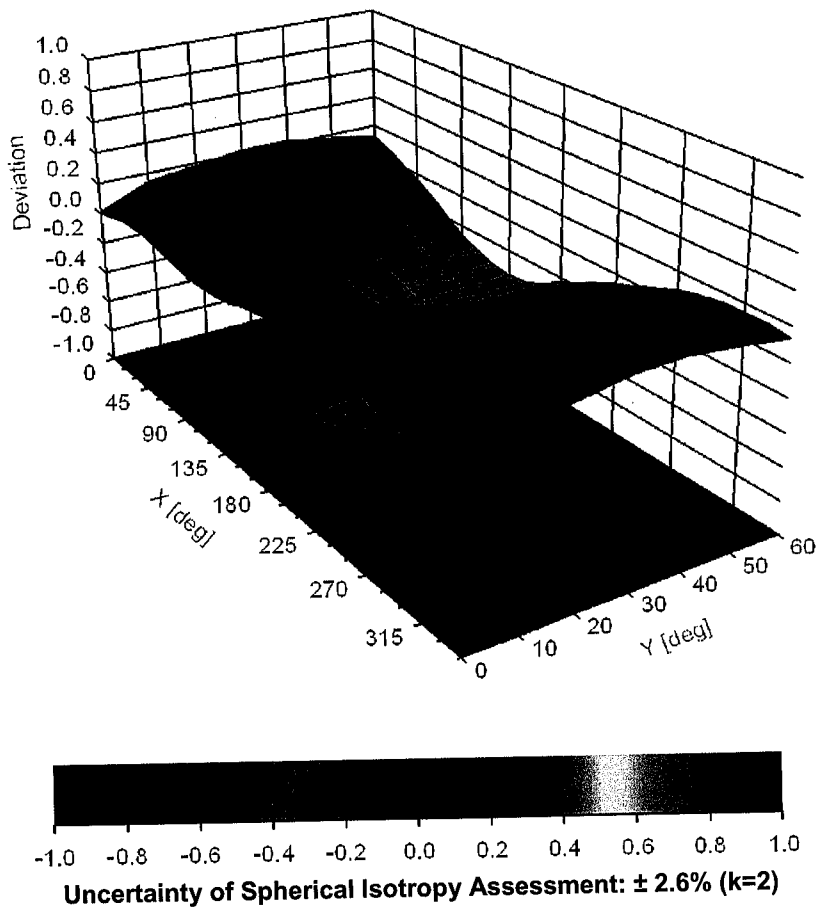


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, ϑ), $f = 900 \text{ MHz}$



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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	45.8
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



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Accreditation No.: **SCS 0108**

Client **Sporton**

Certificate No: **ES3-3191 Jan19**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3191**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v7
 Calibration procedure for dosimetric E-field probes**

Calibration date: **January 29, 2019**

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	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
DAE4	SN: 660	19-Dec-18 (No. DAE4-660_Dec18)	Dec-19
Reference Probe ES3DV2	SN: 3013	31-Dec-18 (No. ES3-3013_Dec18)	Dec-19
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-18)	In house check: Oct-19

Calibrated by:	Name	Function	Signature
	Michael Weber	Laboratory Technician	
Approved by:	Name	Function	Signature
	Katja Pokovic	Technical Manager	

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Issued: February 1, 2019



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Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ 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:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,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
- A_{x,y,z}, B_{x,y,z}, C_{x,y,z}, D_{x,y,z}, VR_{x,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 $f \leq 800$ 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 NORM_{x,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 NORM_x (no uncertainty required).

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3191

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.27	1.25	1.32	$\pm 10.1 \%$
DCP (mV) ^B	93.6	100.1	97.4	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	200.0	$\pm 3.8 \%$	$\pm 4.7 \%$
		Y	0.0	0.0	1.0		212.2		
		Y	0.0	0.0	1.0		211.9		

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 Pages 5 and 6).

^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: ES3DV3 - SN:3191

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-5.1
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3191

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	6.59	6.59	6.59	0.80	1.16	± 12.0 %
835	41.5	0.90	6.38	6.38	6.38	0.52	1.40	± 12.0 %
1750	40.1	1.37	5.51	5.51	5.51	0.53	1.38	± 12.0 %
1900	40.0	1.40	5.28	5.28	5.28	0.77	1.20	± 12.0 %
2000	40.0	1.40	5.21	5.21	5.21	0.79	1.18	± 12.0 %
2300	39.5	1.67	4.85	4.85	4.85	0.53	1.51	± 12.0 %
2450	39.2	1.80	4.69	4.69	4.69	0.80	1.25	± 12.0 %
2600	39.0	1.96	4.47	4.47	4.47	0.73	1.32	± 12.0 %

^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 below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. 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.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3191

Calibration Parameter Determined in Body Tissue Simulating Media

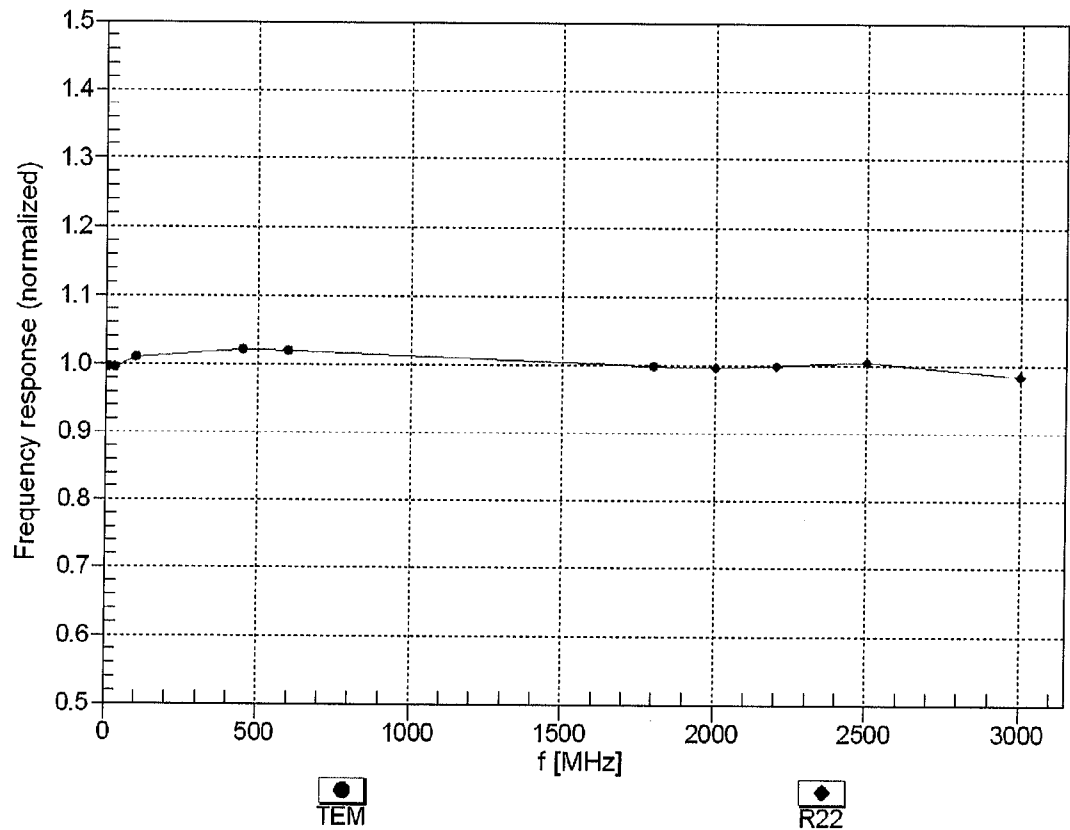
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	55.5	0.96	6.38	6.38	6.38	0.80	1.19	± 12.0 %
835	55.2	0.97	6.17	6.17	6.17	0.65	1.31	± 12.0 %
1750	53.4	1.49	5.20	5.20	5.20	0.49	1.61	± 12.0 %
1900	53.3	1.52	4.94	4.94	4.94	0.59	1.52	± 12.0 %
2300	52.9	1.81	4.72	4.72	4.72	0.71	1.34	± 12.0 %
2450	52.7	1.95	4.56	4.56	4.56	0.74	1.23	± 12.0 %
2600	52.5	2.16	4.38	4.38	4.38	0.80	1.20	± 12.0 %

^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 below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. 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:ifi1110 EXX, Waveguide: R22)

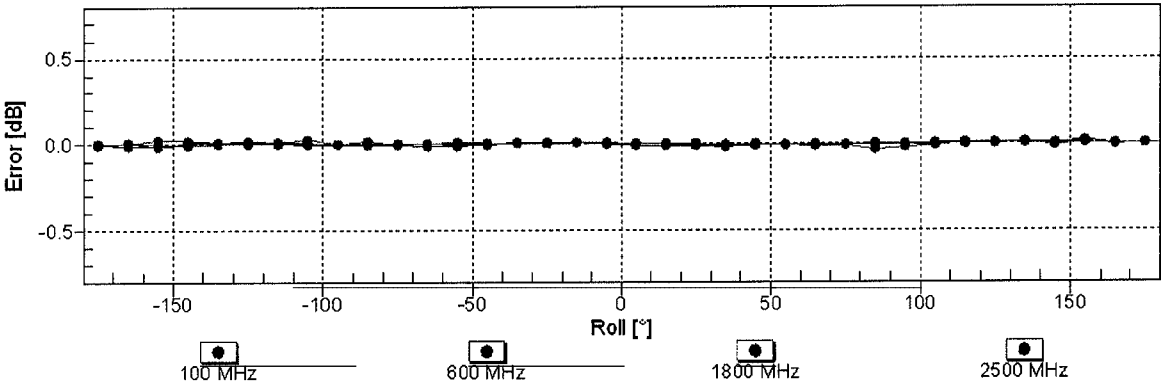
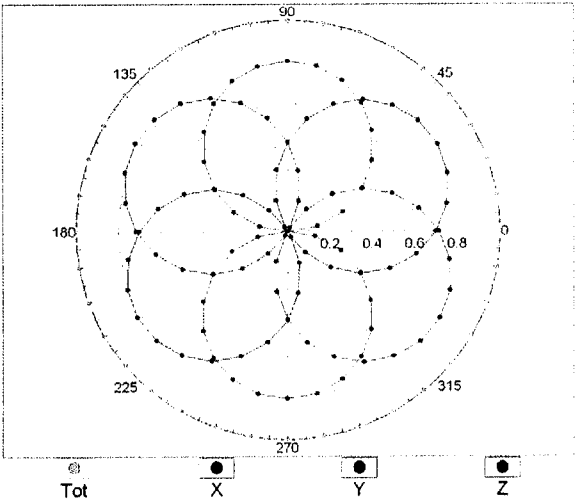
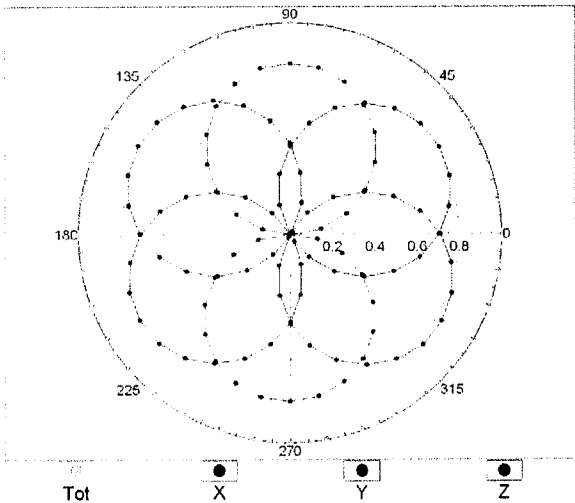


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\theta = 0^\circ$

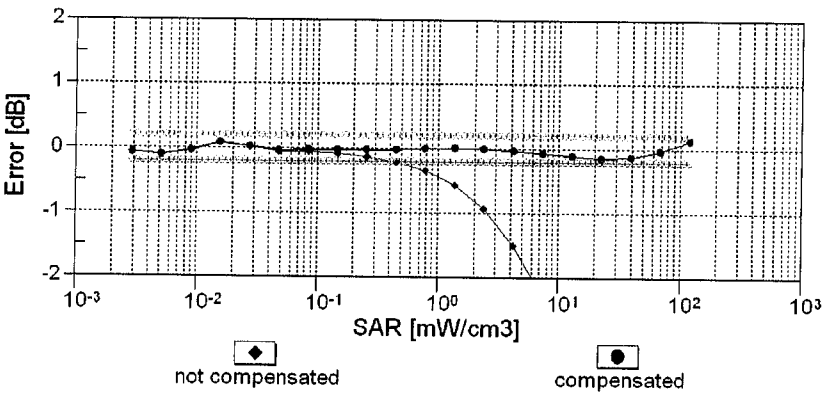
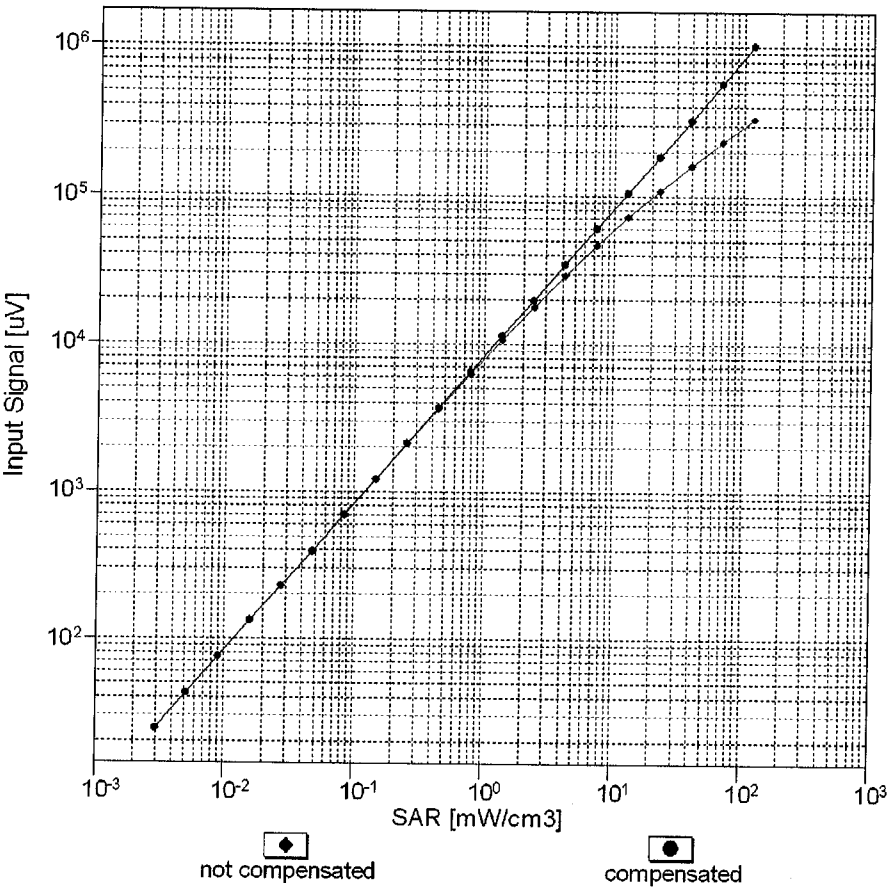
f=600 MHz,TEM

f=1800 MHz,R22



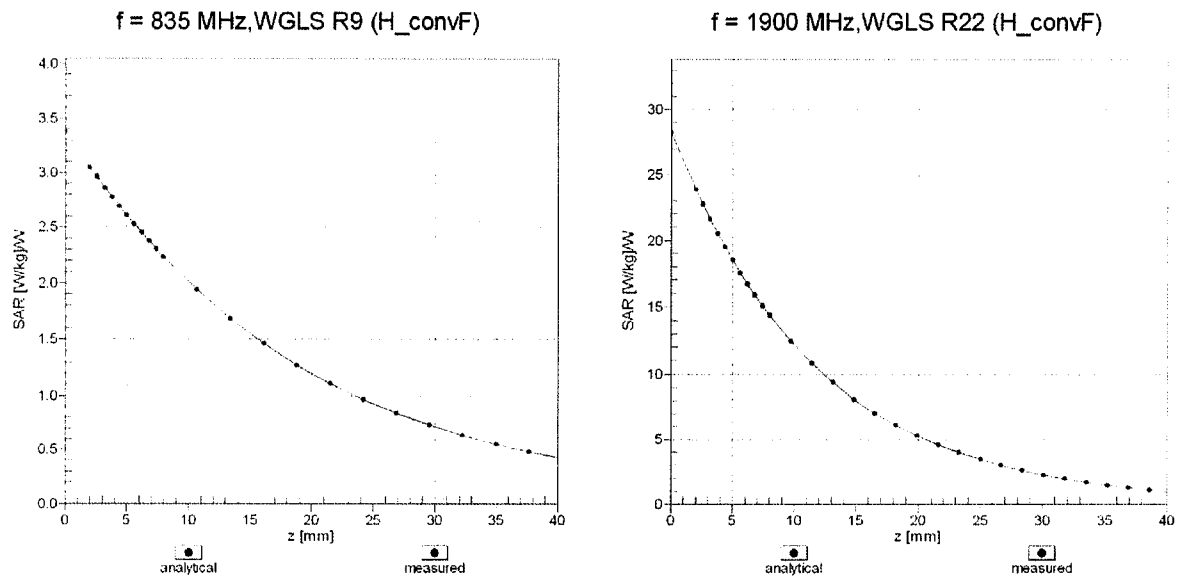
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f_{eval}= 1900 MHz)



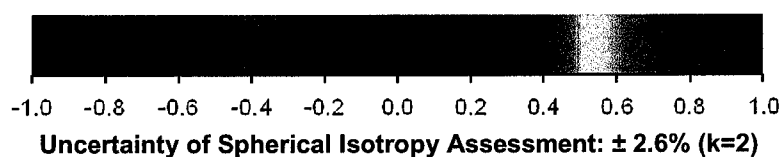
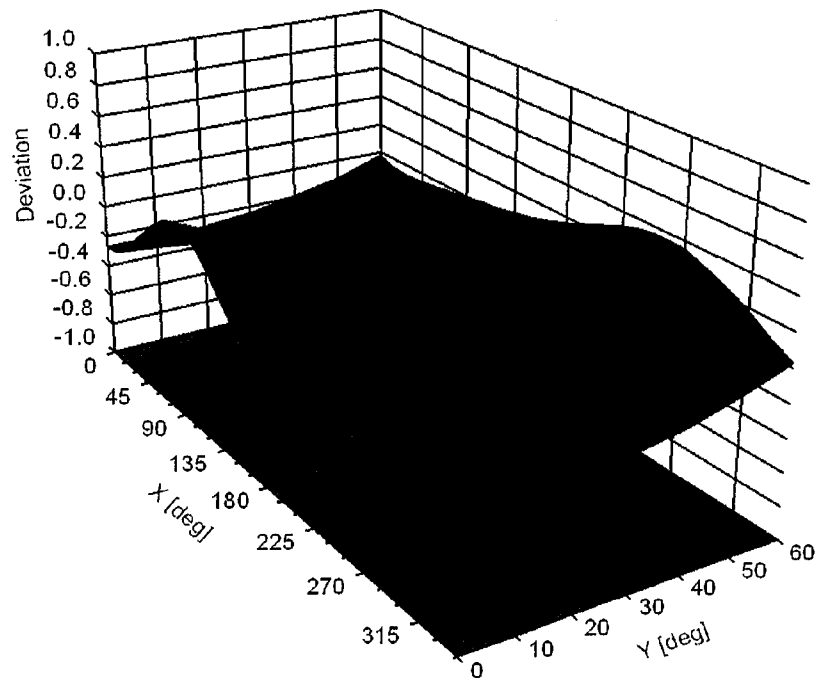
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), $f = 900 \text{ MHz}$



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)



Appendix D. Dynamic Tuning Supplement Head & Body SAR Result

Dynamic Tuning Supplemental Head & Body SAR Results are shown as follows.

Head (Antenna 3, Slave ID=D)																						
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										0	9	18	27	36	45	54	63	72	81	90	99	108
GSM850	Reducd Power 1	GPRS(4 Tx slot)	251	848.8	N/A	N/A	Left Cheek	0 mm	0.581	0.58	0.336	0.313	0.052	0.015	0.42	0.158	0.068	0.009	0.537	0.255	0.15	0.279
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										1	10	19	28	37	46	55	64	73	82	91	100	109
WCDMA V	Reducd Power 1	RMC 12.2Kbps	4182	836.4	N/A	N/A	Left Cheek	0 mm	0.64	0.011	0.598	0.315	0.173	0.008	0.492	0.452	0.084	0.059	0.573	0.438	0.24	0.131
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										2	11	20	29	38	47	56	65	74	83	92	101	110
CDMA BC0	Reducd Power 1	RC3+SO55	1013	824.7	N/A	N/A	Left Cheek	0 mm	0.71	0.045	0.661	0.446	0.289	0.043	0.658	0.663	0.166	0.123	0.708	0.696	0.107	0.028
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										3	12	21	30	39	48	57	66	75	84	93	102	111
CDMA BC10	Reducd Power 1	RC3+SO55	580	820.5	N/A	N/A	Left Cheek	0 mm	0.737	0.063	0.013	0.719	0.396	0.067	0.062	0.728	0.269	0.181	0.012	0.44	0.058	0.057
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										4	13	22	31	40	49	58	67	76	85	94	103	
LTE Band 5	Reducd Power 1	10M_QPSK	20525	836.5	25RB	0Offset	Left Cheek	0 mm	0.501	0.076	0.009	0.476	0.275	0.075	0.053	0.492	0.35	0.148	0.041	0.326	0.075	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										5	14	23	32	41	50	59	68	77	86	95	104	
LTE Band 12	Reducd Power 1	10M_QPSK	23095	707.5	25RB	0Offset	Left Cheek	0 mm	0.442	0.041	0.011	0.152	0.309	0.209	0.009	0.136	0.159	0.015	0.023	0.022	0.217	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										6	15	24	33	42	51	60	69	78	87	96	105	
LTE Band 13	Reducd Power 1	10M_QPSK	23230	782	25RB	0Offset	Left Cheek	0 mm	0.735	0.113	0.089	0.124	0.7	0.286	0.33	0.042	0.267	0.29	0.016	0.645	0.229	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										7	16	25	34	43	52	61	70	79	88	97	106	
LTE Band 26	Reducd Power 1	15M_QPSK	26965	841.5	36RB	0Offset	Left Cheek	0 mm	0.545	0.216	0.057	0.047	0.501	0.326	0.143	0.035	0.373	0.345	0.062	0.255	0.028	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										8	17	26	35	44	53	62	71	80	89	98	107	
LTE Band 71	Reducd Power 1	20M_QPSK	133322	683	1RB	0Offset	Left Cheek	0 mm	0.721	0.087	0.023	0.029	0.154	0.162	0.046	0.044	0.015	0.039	0.021	0.261	0.405	

Body (Antenna 3, Slave ID=D)																						
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										0	9	18	27	36	45	54	63	72	81	90	99	108
GSM850	Hotspot On	GPRS(3 Tx slots)	251	848.8	N/A	N/A	Left Side	10mm	0.478	0.469	0.404	0.287	0.089	0.076	0.228	0.222	0.073	0.051	0.25	0.184	0.196	0.28
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										1	10	19	28	37	46	55	64	73	82	91	100	109
WCDMA V	Hotspot On	RMC 12.2Kbps	4132	826.4	N/A	N/A	Left Side	10mm	0.641	0.13	0.575	0.29	0.17	0.11	0.416	0.429	0.084	0.049	0.464	0.399	0.281	0.168
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										2	11	20	29	38	47	56	65	74	83	92	101	110
CDMA BC0	Hotspot On	RTAP 153.6Kbps	384	836.52	N/A	N/A	Left Side	10mm	0.747	0.056	0.629	0.558	0.246	0.086	0.416	0.545	0.139	0.068	0.47	0.612	0.376	0.174
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										3	12	21	30	39	48	57	66	75	84	93	102	111
CDMA BC10	Hotspot On	RTAP 153.6Kbps	580	820.5	N/A	N/A	Left Side	10mm	0.695	0.063	0.058	0.544	0.336	0.056	0.046	0.627	0.232	0.111	0.092	0.308	0.065	0.061
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										4	13	22	31	40	49	58	67	76	85	94	103	
LTE Band 5	Hotspot On	10M_QPSK	20525	836.5	25RB	0Offset	Back	10mm	0.74	0.099	0.088	0.487	0.423	0.087	0.056	0.559	0.406	0.138	0.033	0.289	0.094	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										5	14	23	32	41	50	59	68	77	86	95	104	
LTE Band 12	Hotspot On	10M_QPSK	23095	707.5	25RB	0Offset	Left Side	10mm	0.499	0.085	0.079	0.106	0.208	0.141	0.032	0.093	0.107	0.095	0.046	0.085	0.141	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										6	15	24	33	42	51	60	69	78	87	96	105	
LTE Band 13	Hotspot On	10M_QPSK	23230	782	25RB	0Offset	Left Side	10mm	0.593	0.119	0.099	0.101	0.559	0.286	0.266	0.078	0.276	0.308	0.032	0.58	0.229	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										7	16	25	34	43	52	61	70	79	88	97	106	
LTE Band 26	Hotspot On	15M_QPSK	26865	831.5	1RB	0Offset	Left Side	10mm	0.673	0.193	0.055	0.051	0.498	0.3	0.147	0.046	0.349	0.327	0.064	0.289	0.054	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)												
										8	17	26	35	44	53	62	71	80	89	98	107	
LTE Band 71	Hotspot On	20M_QPSK	133322	683	50RB	0Offset	Left Side	10mm	0.793	0.075	0.033	0.029	0.116	0.124	0.043	0.038	0.044	0.029	0.032	0.17	0.29	

Head (Antenna 2, Slave ID=D)																	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)								
										1	3	5	7	9	11	13	15
LTE Band 7	Reducd Power 1	20M_QPSK	20850	2510	50RB	0Offset	Right Cheek	0 mm	0.645	0.635	0.637	0.635	0.634	0.633	0.635	0.636	0.634
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)								
										2	4	6	8	10	12	14	16
LTE Band 41	Reducd Power 1	20M_QPSK	41490	2680	50RB	24Offset	Right Cheek	0 mm	0.64	0.592	0.593	0.594	0.593	0.595	0.596	0.595	0.594

Head (Antenna 2, Slave ID=D)																	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)								
										1	3	5	7	9	11	13	15
LTE Band 7	Hotspot on	20M_QPSK	21100	2535	1RB	0Offset	Top Side	10 mm	0.773	0.699	0.668	0.669	0.702	0.674	0.666	0.673	0.668
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)								
										2	4	6	8	10	12	14	16
LTE Band 41	Hotspot on	20M_QPSK	41055	2636.5	50RB	24Offset	Top Side	10 mm	0.727	0.418	0.465	0.424	0.439	0.435	0.423	0.424	0.422

Head (Antenna 1, Slave ID=D)																				
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										0	9	18	27	36	45	54	63	72	81	90
GSM1900	Full Power	GPRS(3 Tx slots)	512	1850.2	N/A	N/A	Left Cheek	0 mm	0.076	0.045	0.049	0.041	0.072	0.071	0	0.055	0.066	0.045	0	0.062
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										1	10	19	28	37	46	55	64	73	82	91
WCDMA IV	Full Power	RMC 12.2Kbps	1312	1712.4	N/A	N/A	Right Cheek	0 mm	0.24	0.23	0.101	0.112	0.115	0.118	0.055	0.075	0.114	0.07	0.045	0.074
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										2	11	20	29	38	47	56	65	74	83	92
WCDMA II	Full Power	RMC 12.2Kbps	9538	1907.6	N/A	N/A	Left Cheek	0 mm	0.182	0.068	0.089	0.076	0.115	0.118	0.083	0.091	0.097	0.125	0.088	0.093
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										3	12	21	30	39	48	57	66	75	84	93
CDMA2000 BC1	Full Power	RC3+SO55	600	1880	N/A	N/A	Left Cheek	0 mm	0.161	0.105	0.068	0.075	0.128	0.154	0.159	0.102	0.116	0.141	0.105	0.16
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										4	13	22	31	40	49	58	67	76	85	94
LTE Band 66	Full Power	20M_QPSK	132322	1745	1RB	0Offset	Right Cheek	0 mm	0.229	0.107	0.095	0.089	0.092	0.126	0.125	0.062	0.007	0.074	0.098	0.11
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										5	14	23	32	41	50	59	68	77	86	95
LTE Band 7	Full Power	20M_QPSK	21350	2560	1RB	0Offset	Left Cheek	0 mm	0.316	0.109	0.188	0.182	0.297	0.132	0.232	0.152	0.315	0.156	0.164	0.168
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										6	15	24	33	42	51	60	69	78	87	
LTE Band 25	Full Power	20M_QPSK	26590	1905	1RB	0Offset	Left Cheek	0 mm	0.165	0.109	0.153	0.163	0.159	0.125	0.155	0.132	0.159	0.14	0.138	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										7	16	25	34	43	52	61	70	79	88	
LTE Band 30	Full Power	10M_QPSK	27710	2310	1RB	25Offset	Left Cheek	0 mm	0.181	0.053	0.068	0.079	0.145	0.096	0.11	0.142	0.105	0.144	0.108	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										8	17	26	35	44	53	62	71	80	89	
LTE Band 41	Full Power	20M_QPSK	40620	2593	1RB	49Offset	Left Cheek	0 mm	0.25	0.193	0.182	0.142	0.185	0.198	0.152	0.112	0.116	0.172	0.148	

Body (Antenna 1, Slave ID=D)																				
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										0	9	18	27	36	45	54	63	72	81	90
GSM1900	Full Power	GPRS(3 Tx slots)	661	1880	N/A	N/A	Bottom Side	10 mm	0.619	0.472	0.492	0.523	0.533	0.611	0.609	0.522	0.602	0.515	0.498	0.605
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										1	10	19	28	37	46	55	64	73	82	91
WCDMA IV	Hotspot On	RMC 12.2Kbps	1513	1752.6	N/A	N/A	Bottom Side	10 mm	0.627	0.621	0.599	0.464	0.536	0.605	0.613	0.451	0.598	0.461	0.503	0.438
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										2	11	20	29	38	47	56	65	74	83	92
WCDMA II	Hotspot On	RMC 12.2Kbps	9538	1907.6	N/A	N/A	Bottom Side	10 mm	0.74	0.487	0.402	0.383	0.511	0.656	0.609	0.543	0.559	0.596	0.602	0.543
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										3	12	21	30	39	48	57	66	75	84	93
CDMA2000 BC1	Hotspot On	RTAP 153.6Kbps	1175	1908.75	N/A	N/A	Bottom Side	10 mm	0.815	0.447	0.394	0.509	0.695	0.556	0.809	0.709	0.653	0.691	0.496	0.759
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										4	13	22	31	40	49	58	67	76	85	94
LTE Band 66	Hotspot On	20M_QPSK	132322	1745	50RB	0Offset	Bottom Side	10 mm	0.671	0.588	0.607	0.522	0.458	0.559	0.662	0.655	0.534	0.503	0.389	0.628
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										5	14	23	32	41	50	59	68	77	86	95
LTE Band 7	Hotspot On	20M_QPSK	21350	2560	1RB	0Offset	Back	10 mm	0.998	0.617	0.386	0.741	0.688	0.587	0.522	0.709	0.703	0.622	0.363	0.737
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										6	15	24	33	42	51	60	69	78	87	
LTE Band 25	Hotspot On	20M_QPSK	26340	1880	50RB	0Offset	Bottom Side	10 mm	0.846	0.552	0.487	0.698	0.46	0.652	0.704	0.701	0.444	0.568	0.687	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										7	16	25	34	43	52	61	70	79	88	
LTE Band 30	Hotspot On	10M_QPSK	27710	2310	25RB	0Offset	Front	10 mm	0.642	0.302	0.182	0.284	0.378	0.28	0.297	0.168	0.276	0.385	0.298	
Mode	Power Reduction	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
										8	17	26	35	44	53	62	71	80	89	
LTE Band 41	Hotspot On	20M_QPSK	41490	2680	50RB	24Offset	Bottom Side	10 mm	0.661	0.419	0.391	0.321	0.389	0.427	0.401	0.282	0.394	0.385	0.381	