



Prepared (also subject responsible if other) SEM/CV/PF/P Gerard Hayes and Rodney Dixon	No. REP 2006 001 Z525A 01
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## Appendix 4

### Probe Calibration Certificates



REPORT

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ET3DV6 SN:1586

May 26, 2005

**DASY - Parameters of Probe: ET3DV6 SN:1586**

Sensitivity in Free Space<sup>A</sup>

Diode Compression<sup>B</sup>

NormX	1.90 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP X	94 mV
NormY	1.84 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Y	94 mV
NormZ	1.89 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Z	94 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL                    900 MHz    Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>90</sub> [%]	Without Correction Algorithm	8.4	4.3
SAR <sub>90</sub> [%]	With Correction Algorithm	0.1	0.2

TSL                    1750 MHz    Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>90</sub> [%]	Without Correction Algorithm	12.2	8.2
SAR <sub>90</sub> [%]	With Correction Algorithm	0.8	0.1

Sensor Offset

Probe Tip to Sensor Center                    2.7 mm

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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

<sup>B</sup> Numerical linearization parameter; uncertainty not required.

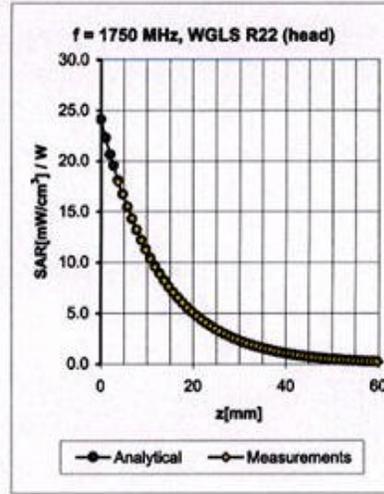
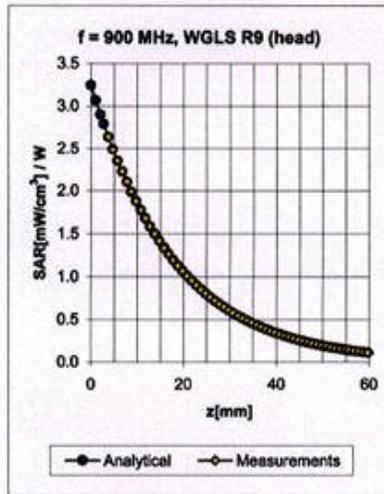


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May 26, 2005

### Conversion Factor Assessment



f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.62	1.76	6.58 ± 11.0% (k=2)	
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.61	1.78	6.46 ± 11.0% (k=2)	
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.59	2.26	5.29 ± 11.0% (k=2)	
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.56	2.50	5.10 ± 11.0% (k=2)	
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.66	2.22	4.58 ± 11.8% (k=2)	
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.54	1.96	6.51 ± 11.0% (k=2)	
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.52	2.05	6.21 ± 11.0% (k=2)	
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.55	2.76	4.71 ± 11.0% (k=2)	
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.56	2.76	4.61 ± 11.0% (k=2)	
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.68	2.13	4.26 ± 11.8% (k=2)	

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.



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**DASY - Parameters of Probe: ET3DV6 SN:1587**

Sensitivity in Free Space<sup>A</sup>

Diode Compression<sup>B</sup>

NormX	2.05 ± 10.1%	$\mu V/(V/m)^2$	DCP X	95 mV
NormY	1.92 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	95 mV
NormZ	1.79 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	95 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL                    900 MHz    Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without Correction Algorithm	8.1	4.4
SAR <sub>be</sub> [%]	With Correction Algorithm	0.1	0.2

TSL                    1750 MHz    Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without Correction Algorithm	12.4	8.5
SAR <sub>be</sub> [%]	With Correction Algorithm	0.5	0.1

Sensor Offset

Probe Tip to Sensor Center                    2.7 mm

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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

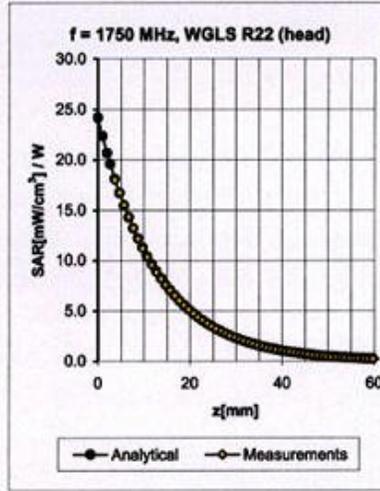
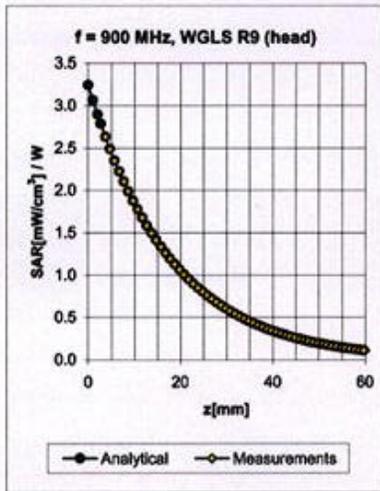


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May 26, 2005

### Conversion Factor Assessment



f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.60	1.76	6.78 ± 11.0%	(k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.55	1.85	6.50 ± 11.0%	(k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.50	2.53	5.45 ± 11.0%	(k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.47	2.71	5.05 ± 11.0%	(k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.58	2.40	4.55 ± 11.8%	(k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.51	1.97	6.65 ± 11.0%	(k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.51	2.03	6.37 ± 11.0%	(k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.48	2.94	4.74 ± 11.0%	(k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.50	3.13	4.57 ± 11.0%	(k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.53	2.51	4.16 ± 11.8%	(k=2)

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.



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ET3DV6 SN:1539

November 22, 2005

**DASY - Parameters of Probe: ET3DV6 SN:1539**

Sensitivity in Free Space<sup>A</sup>

Diode Compression<sup>B</sup>

NormX	1.36 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP X	89 mV
NormY	1.27 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Y	89 mV
NormZ	1.39 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Z	89 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL                    900 MHz    Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>iso</sub> [%]	Without Correction Algorithm	8.8	4.7
SAR <sub>iso</sub> [%]	With Correction Algorithm	0.1	0.3

TSL                    1750 MHz    Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>iso</sub> [%]	Without Correction Algorithm	13.0	8.4
SAR <sub>iso</sub> [%]	With Correction Algorithm	0.8	0.0

Sensor Offset

Probe Tip to Sensor Center                    2.7 mm

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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

<sup>B</sup> Numerical linearization parameter; uncertainty not required.

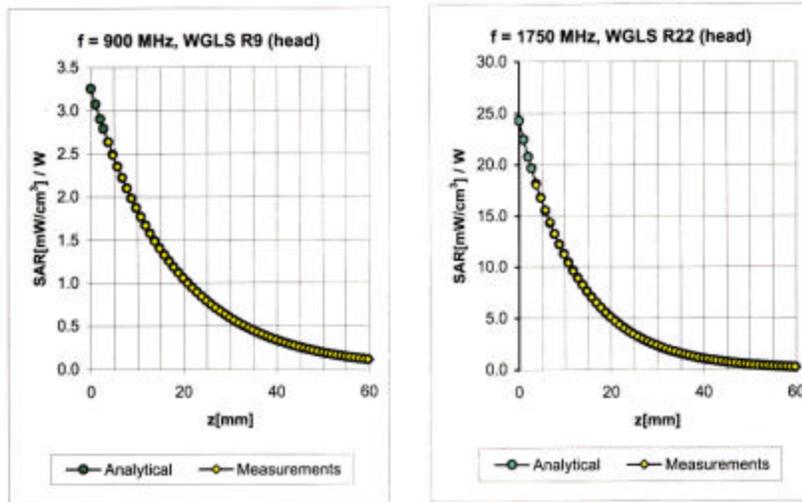


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ET3DV6 SN:1539

November 22, 2005

### Conversion Factor Assessment



f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.63	1.80	5.99 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.54	1.93	5.86 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.66	2.19	4.76 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.64	2.43	4.55 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.81	2.04	4.06 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.56	1.99	5.88 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.53	2.08	5.63 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.65	2.48	4.21 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.66	2.48	4.12 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	1.18	1.35	4.06 ± 11.8% (k=2)

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.



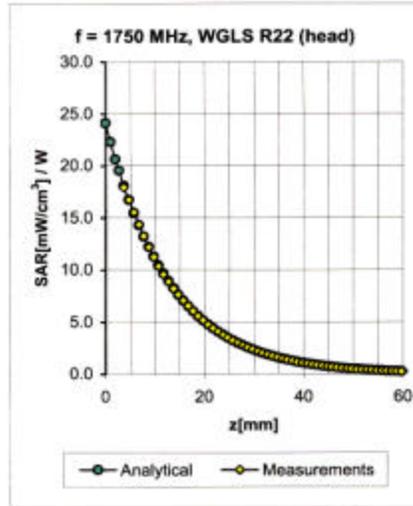
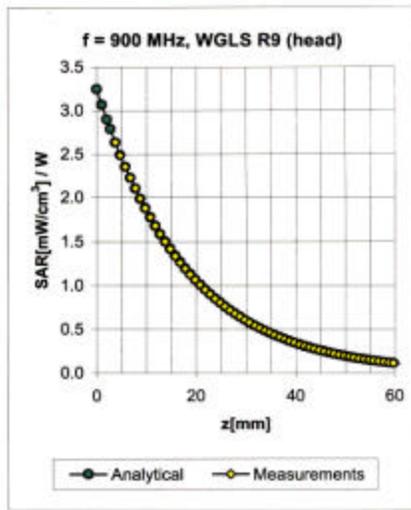


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ET3DV6 SN:1586

May 26, 2005

### Conversion Factor Assessment



f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.62	1.76	6.58 ± 11.0%	(k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.61	1.78	6.46 ± 11.0%	(k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.59	2.26	5.29 ± 11.0%	(k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.56	2.50	5.10 ± 11.0%	(k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.66	2.22	4.58 ± 11.8%	(k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.54	1.96	6.51 ± 11.0%	(k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.52	2.05	6.21 ± 11.0%	(k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.55	2.76	4.71 ± 11.0%	(k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.56	2.76	4.61 ± 11.0%	(k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.68	2.13	4.26 ± 11.8%	(k=2)

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.



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## Appendix 5

### Measurement Uncertainty Budget



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**Table 1a. Uncertainty Budget for System Performance Check (Dipole & flat phantom) DASY3 System**

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	$e = f(d, k)$	<i>f</i>	<i>g</i>	$h = c \times f / e$	$i = c \times g / e$	<i>k</i>
Uncertainty Component	Sec.	Tol. (± %)	Prob. Dist.	Div.	$c_i$ (1-g)	$c_i$ (10-g)	1-g $u_i$ (±%)	10-g $u_i$ (±%)	$v_i$
<b>Measurement System</b>									
Probe Calibration ( $k=1$ )	E.2.1	4.8	N	1	1	1	4.8	4.8	$\infty$
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	$\infty$
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	$\infty$
Boundary Effect	E.2.3	8.3	R	1.73	1	1	4.8	4.8	$\infty$
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	$\infty$
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	$\infty$
Readout Electronics	E.2.6	1.0	N	1	1	1	1.0	1.0	$\infty$
Response Time	E.2.7	0.0	R	1.73	1	1	0.0	0.0	$\infty$
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	$\infty$
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	$\infty$
Probe Positioner Mechanical Tolerance (corresponds to the mechanical constraints of the robot)	E.6.2	0.4	R	1.73	1	1	0.2	0.2	$\infty$
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	$\infty$
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	$\infty$
<b>Dipole</b>									
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	$\infty$
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	$\infty$
<b>Phantom and Tissue Parameters</b>									
Phantom Uncertainty - shell thickness tolerance	E.3.1	4.0	R	1.73	1	1	2.3	2.3	$\infty$
Liquid Conductivity - deviation from target values (5)	E.3.2	4.3	R	1.73	0.64	0.43	1.59	1.07	$\infty$



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Liquid Conductivity - measurement uncertainty (6)	E.3.3	6.20	R	1.73	0.64	0.43	2.29	1.54	∞
Liquid Permittivity - deviation from target values (5)	E.3.2	3.7	R	1.73	0.6	0.49	1.28	1.05	∞
Liquid Permittivity - measurement uncertainty (6)	E.3.3	6.08	R	1.73	0.6	0.49	2.11	1.72	∞
<b>Combined Standard Uncertainty</b>			RSS				10.61	10.31	
<b>Expanded Uncertainty (95% C.L.)</b>							21.22	20.62	



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**Table 1b. Uncertainty Budget for System Performance Check (Dipole & flat phantom) DASY4 System**

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>	<i>k</i>
Uncertainty Component	Sec.	Tol. (± %)	Prob. Dist.	Div.	<i>c<sub>i</sub></i> (1-g)	<i>c<sub>i</sub></i> (10-g)	1-g <i>u<sub>i</sub></i> (±%)	10-g <i>u<sub>i</sub></i> (±%)	<i>v<sub>i</sub></i>
<b>Measurement System</b>									
Probe Calibration ( <i>k=1</i> )	E.2.1	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Axial Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Hemispherical Isotropy	E.2.2	1.0	R	1.73	1	1	0.6	0.6	∞
Boundary Effect	E.2.3	4.7	R	1.73	1	1	2.7	2.7	∞
Linearity	E.2.4	1.0	R	1.73	1	1	0.6	0.6	∞
System Detection Limits	E.2.5	1.0	N	1	1	1	1.0	1.0	∞
Readout Electronics	E.2.6	0.8	R	1.73	1	1	0.5	0.5	∞
Response Time	E.2.7	2.6	R	1.73	1	1	1.5	1.5	∞
Integration Time	E.2.8	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance (corresponds to the mechanical constraints of the robot)	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1	1	0.6	0.6	∞
<b>Dipole</b>									
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
<b>Phantom and Tissue Parameters</b>									
Phantom Uncertainty - shell thickness tolerance	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values (5)	E.3.2	4.3	R	1.73	0.64	0.43	1.59	1.07	∞



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Liquid Conductivity - measurement uncertainty (6)	E.3.3	6.20	R	1.73	0.64	0.43	2.29	1.54	∞
Liquid Permittivity - deviation from target values (5)	E.3.2	3.7	R	1.73	0.6	0.49	1.28	1.05	∞
Liquid Permittivity - measurement uncertainty (6)	E.3.3	6.08	R	1.73	0.6	0.49	2.11	1.72	∞
<b>Combined Standard Uncertainty</b>			RSS				9.37	9.03	
<b>Expanded Uncertainty (95% C.L.)</b>							18.74	18.05	



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**Table 2a: Uncertainty Budget for the Device Under Test with DASY3 System**

a	b	c	d	$e = f(d,k)$	f	g	$h = c \times f / e$	$i = c \times g / e$	k
Uncertainty Component	Sec.	Tol. ( $\pm$ %)	Prob. Dist.	Div.	$c_i$ (1-g)	$c_i$ (10-g)	1-g $u_i$ ( $\pm$ %)	10-g $u_i$ ( $\pm$ %)	$v_i$
<b>Measurement System</b>									
Probe Calibration ( $k=1$ )	E.2.1	4.8	N	1	1	1	4.8	4.8	$\infty$
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	$\infty$
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	$\infty$
Boundary Effect	E.2.3	8.3	R	1.73	1	1	4.8	4.8	$\infty$
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	$\infty$
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	$\infty$
Readout Electronics	E.2.6	1.0	N	1	1	1	1.0	1.0	$\infty$
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	$\infty$
Integration Time	E.2.8	1.4	R	1.73	1	1	0.8	0.8	$\infty$
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	$\infty$
Probe Positioner Mechanical Tolerance (corresponds to the mechanical constraints of the robot)	E.6.2	0.4	R	1.73	1	1	0.2	0.2	$\infty$
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	$\infty$
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	$\infty$
<b>Test sample Related</b>									
Test Sample Positioning	E.4.2	1.3	N	1	1	1	1.3	1.3	4
Device Holder Uncertainty	E.4.1	1.9	R	1.73	1	1	1.1	1.1	4
Output Power Variation - SAR drift measurement (4)	6.6.2	5.0	R	1.73	1	1	2.9	2.9	$\infty$
Phantom and Tissue Parameters									



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Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values (5)	E.3.2	4.3	R	1.73	0.64	0.43	1.6	1.1	∞
Liquid Conductivity - measurement uncertainty (6)	E.3.3	6.20	R	1.73	0.64	0.43	2.3	1.5	∞
Liquid Permittivity - deviation from target values (5)	E.3.2	3.7	R	1.73	0.6	0.49	1.3	1.0	∞
Liquid Permittivity - measurement uncertainty (6)	E.3.3	6.08	R	1.73	0.6	0.49	2.1	1.7	∞
<b>Combined Standard Uncertainty</b>			RSS				10.77	10.46	
<b>Expanded Uncertainty</b> (95% CONFIDENCE LEVEL)			K=2				21.55	20.93	



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**Table 2b: Uncertainty Budget for the Device Under Test with DASY4 System**

a	b	c	d	$e = f(d,k)$	f	g	$h = c \times f / e$	$i = c \times g / e$	k
Uncertainty Component	Sec.	Tol. ( $\pm$ %)	Prob. Dist.	Div.	$c_i$ (1-g)	$c_i$ (10-g)	1-g $u_i$ ( $\pm$ %)	10-g $u_i$ ( $\pm$ %)	$v_i$
<b>Measurement System</b>									
Probe Calibration ( $k=1$ )	E.2.1	4.8	N	1	1	1	4.8	4.8	$\infty$
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	$\infty$
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	$\infty$
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	$\infty$
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	$\infty$
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	$\infty$
Readout Electronics	E.2.6	1.0	N	1	1	1	1.0	1.0	$\infty$
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	$\infty$
Integration Time	E.2.8	2.6	R	1.73	1	1	1.5	1.5	$\infty$
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	$\infty$
Probe Positioner Mechanical Tolerance (corresponds to the mechanical constraints of the robot)	E.6.2	0.4	R	1.73	1	1	0.2	0.2	$\infty$
Probe Positioning with respect to Phantom Shell	E.6.3	2.9	R	1.73	1	1	1.7	1.7	$\infty$
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1	1	0.6	0.6	$\infty$
<b>Test sample Related</b>									
Test Sample Positioning	E.4.2	1.3	N	1	1	1	1.3	1.3	4
Device Holder Uncertainty	E.4.1	1.9	R	1.73	1	1	1.1	1.1	4
Output Power Variation - SAR drift measurement (4)	6.6.2	5.0	R	1.73	1	1	2.9	2.9	$\infty$
Phantom and Tissue Parameters									



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Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values (5)	E.3.2	4.3	R	1.73	0.64	0.43	1.6	1.1	∞
Liquid Conductivity - measurement uncertainty (6)	E.3.3	6.20	R	1.73	0.64	0.43	2.3	1.5	∞
Liquid Permittivity - deviation from target values (5)	E.3.2	3.7	R	1.73	0.6	0.49	1.3	1.0	∞
Liquid Permittivity - measurement uncertainty (6)	E.3.3	6.08	R	1.73	0.6	0.49	2.1	1.7	∞
<b>Combined Standard Uncertainty</b>			RSS				<b>9.49</b>	<b>9.14</b>	
<b>Expanded Uncertainty (95% CONFIDENCE LEVEL)</b>			K=2				<b>18.98</b>	<b>18.28</b>	



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**Table 3a. Values for e'**

Uncertainty Component	Tolerance (±%)	Probability Distribution	Divisor	c <sub>i</sub>	Standard Uncertainty (±%)	v <sub>i</sub> or v <sub>eff</sub>
Repeatability (n repeats)	0.97	N	1	1	0.97	4
Network analyzer uncertainty sources	8.38	R	1.73	1	4.83	∞
Dielectric Error Sources	5.93	R	1.73	1	3.42	∞
<b>Combined standard uncertainty</b>					<b>6.08</b>	

**Table 3b. Values for s**

Uncertainty Component	Tolerance (±%)	Probability Distribution	Divisor	c <sub>i</sub>	Standard Uncertainty (±%)	v <sub>i</sub> or v <sub>eff</sub>
Repeatability (n repeats)	1.85	N	1	1	1.85	4
Network analyzer uncertainty sources	8.38	R	1.73	1	4.83	∞
Dielectric Error Sources	5.93	R	1.73	1	3.42	∞
<b>Combined standard uncertainty</b>					<b>6.20</b>	



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## Appendix 6

### Photographs of the Device Under Test



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a. Front



b. Back



c. Side

**View of Device (Closed)**



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a. Front  
b.



c. Back



c. Side

**View of Device (Open)**



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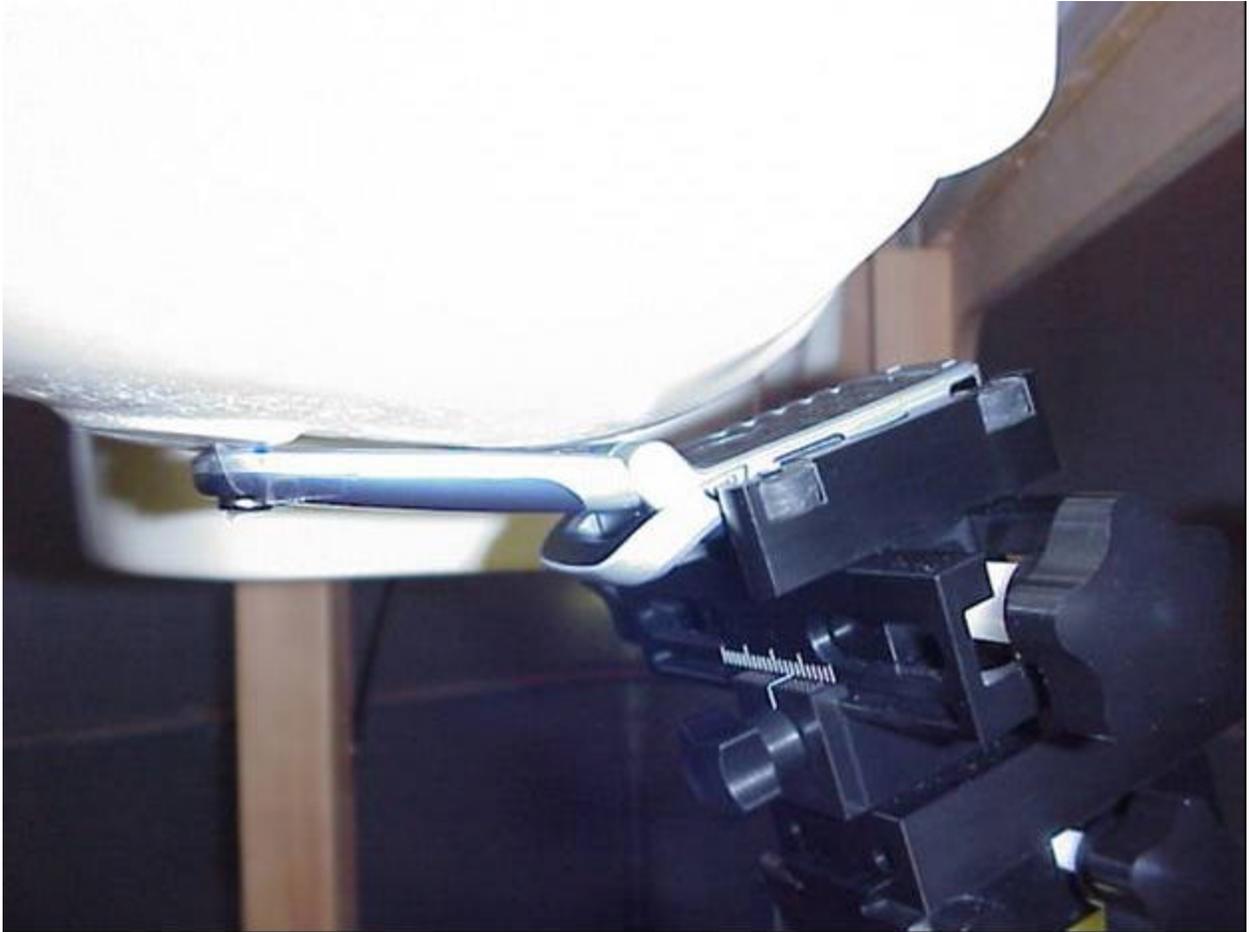


**View of Hands-free Accessory**



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**Position of device against head phantom using the “cheek” position**



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**Position of device against head phantom using the “tilt” position**



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**Position with front of device against flat phantom using a 20MM SPACER with hands free accessory.**



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**Position with back of device against flat phantom using a 20MM SPACER with hands free accessory.**



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**Position with front of device against flat phantom closed using a 25MM SPACER for PTT.**



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**Position with front of device against flat phantom open using a 25MM SPACER for PTT.**