

8. MEASUREMENT UNCERTAINTY

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
Measurement System									
Probe Calibration	E1.1	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	E1.2	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	E1.2	9.6	R	$\sqrt{3}$	0.7	0.7	3.9	3.9	∞
Boundary Effect	E1.3	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
					1	1	2.7	2.7	∞
System Detection Limits	E1.5	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Readout Electronics	E1.6	1.0	N	1	1	1	1.0	1.0	∞
Response Time	E1.7	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
Integration Time	E1.8	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Conditions	E5.1	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E5.2	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
Probe Positioning	E5.3	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Max. SAR Evaluation	E4.2	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E3.2.1	2.9	N	1	1	1	2.9	2.9	145
Device Holder Uncertainty	E3.1.1	3.6	N	1	1	1	3.6	3.6	5
Output Power Variation – SAR drift measurement	E6.2	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E2.1	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Liquid Conductivity – deviation from target values	E2.2	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid Conductivity – measurement uncertainty	E2.2	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid Permittivity – deviation from target values	E2.2	5.0	R	$\sqrt{3}$	0.6	0.5	1.7	1.4	∞
Liquid Permittivity – measurement uncertainty	E2.2	2.5	N	1	0.6	0.5	1.5	1.2	∞
Combined Standard Uncertainty (k=1)			RSS				10.3	10.0	
Expanded Uncertainty (k=2) (95% CONFIDENCE LEVEL)							20.6	20.1	

Table 8.1 Worst-Case uncertainty budget for DASY4 assessed according to IEEE 1528 - 2003.
The budget is valid for the frequency range 300MHz-3GHz and represents a worst-case analysis.