

13.2 SAR results for Standard procedure

There is zoom scan measurement to be added for the highest measured SAR in each exposure configuration/band.

	Ambient Temperature: 22.5 °C Liquid Temperature: 22.0 °C													
Frequency			Teet	Figure	Conducted	Max tune un	Measured	Reported	Measured	Reported	Power			
		Side	Test	Figure	Power		SAR(10g)	SAR(10g)	SAR(1g)	SAR(1g)(Drift			
MHz	Ch.		Position	No.	(dBm)	Power (dBm)	(W/kg)	(W/kg)	(W/kg)	W/kg)	(dB)			
848.8	251	Right	Touch	Fig.1	31.60	33.3	0.454	0.67	0.793	1.17	0.18			

Table 13.2-1: SAR Values (GSM 850 MHz Band - Head)

	Ambient Temperature: 22.5 °C Liquid Temperature: 22.0 °C													
Frequ MHz	ency Ch.	Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)			
848.8	251	GPRS (3)	Rear closed	Fig.2	28.64	29	1.02	1.11	1.42	1.54	-0.08			

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.2-3: SAR Values (GSM1900 MHz Band - Head)

				Ambient	Temperature:	22.5 °C L	iquid Tempera	ture: 22.0 °C			
Freque	ency	0.1	Test	Figure	Conducted	Max. tune-up	Measured	Reported	Measured	Reported	Power
MHz	Ch.	Side	Position	No.	Power (dBm)	Power (dBm)	SAR(10g) (W/kg)	SAR(10g) (W/kg)	SAR(1g) (W/kg)	SAR(1g)(W/kg)	Drift (dB)
1880	661	Right	Touch	Fig.3	28.85	30.3	0.215	0.30	0.343	0.48	-0.05

Table 13.2-4: SAR Values (GSM 1900 MHz Band-Body)

	Ambient Temperature: 22.5 °C						Liquid Temperature: 22.0 °C					
Frequ	Frequency Mode		Mode		Conducted	Max. tune-up	Measured	Reported	Measured	Reported	Power	
MHz	Ch.	(number of timeslots)	Position	Figure No.	Power (dBm)	Power (dBm)	SAR(10g) (W/kg)	SAR(10g) (W/kg)	SAR(1g) (W/kg)	SAR(1g) (W/kg)	Drift (dB)	
1850.2	512	GPRS (3)	Rear closed	Fig.4	25.45	26	0.581	0.66	0.975	1.11	-0.05	

Note1: The distance between the EUT and the phantom bottom is 10mm.



1850.2

512

Rear closed

14 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.

2) When the original highest measured SAR is \geq 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is \geq 1.45W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is \geq 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

			Measurenne		IOI DOUY COM	JU (19)	
Frequency		Test	Spacing	Original	First	The	Second
MHz	Ch.	Position	Spacing (mm)	SAR (W/kg)	Repeated SAR (W/kg)	Ratio	Repeated SAR (W/kg)
848.8	251	Rear closed	10	1.42	1.41	1.01	/

Table 14.1: SAR Measurement Variability for Body GSM850 (1g)

Frequency		Test	Spacing	Original	First	The	Second
MHz	Ch.	Position	(mm)	SAR (W/kg)	Repeated SAR (W/kg)	Ratio	Repeated SAR (W/kg)

0.975

0.973

10

Table 14.2: SAR Measurement Variability for Body GSM1900 (1g)

1.00

1



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	1		1	1			1			
Combined standard uncertainty	<i>u</i> _c =	$\sqrt{\sum_{i=1}^{21}c_i^2u_i^2}$					9.55	9.43	257	
nded uncertainty idence interval of	ı	$u_e = 2u_c$					19.1	18.9		
15.2 Measurement Uncertainty for Normal SAR Tests (3~6GHz)										
Error Description	Туре	Uncertainty	Probably	Div.	(Ci)	(Ci)	Std.	Std.	Degree	
		value	Distribution		1g	10g	Unc.	Unc.	of	
							(1g)	(10g)	freedo	
									m	
surement system			·							
Probe calibration	В	6.55	Ν	1	1	1	6.55	6.55	∞	
Isotropy	В	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞	
Boundary effect	В	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞	
Linearity	В	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞	
Detection limit	В	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞	
Readout electronics	В	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞	
Response time	В	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞	
Integration time	В	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞	
RF ambient conditions-noise	В	0	R	$\sqrt{3}$	1	1	0	0	8	
RF ambient conditions-reflection	В	0	R	$\sqrt{3}$	1	1	0	0	œ	
Probe positioned mech. restrictions	В	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	8	
Probe positioning with respect to phantom shell	В	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	8	
Post-processing	В	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞	
		Test	sample related	1	1					
Test sample positioning	А	3.3	Ν	1	1	1	3.3	3.3	71	
Device holder uncertainty	А	3.4	N	1	1	1	3.4	3.4	5	
Drift of output power	В	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Phantom and set-up										
Phantom uncertainty	В	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞	
Liquid conductivity (target)	В	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	8	
Liquid conductivity (meas.)	А	2.06	N	1	0.64	0.43	1.32	0.89	43	
	uncertainty nded uncertainty idence interval of) 2 Measurement U 2 Measurement U 3 measurement V 4 measurement v 8 measurement v 8 measurement v 1 sotropy 8 oundary effect 1 sotropy 8 oundary effect 1 sotropy 8 oundary effect 1 sotropy 8 oundary effect 1 sotropy 8 measurement 9 measurement 1 megration limit 8 Readout electronics 8 Response time 1 ntegration limit 8 Readout electronics 8 Response time 1 ntegration sec 8 Response time 1 ntegration sec 9 nobe positioned mech. restrictions 9 robe positioned mech. restrictions 9 robe positioned mech. restrictions 9 robe positioned mech. restrictions 9 robe positioned mech. restrictions 9 nobe positioned 9 nobe positione	Inded uncertainty idence interval of idence	uncertainty $u_c = \sqrt{\sum_{i=1}^{c} C_i^2 u_i^2}$ inded uncertainty idence interval of) $u_e = 2u_c$ 2 Measurement Uvertsity for Not Error DescriptionTypeUncertainty valueError DescriptionTypeUncertainty valueProbe calibrationB6.55IsotropyB4.7Boundary effectB2.0LinearityB4.7Detection limitB0.3Response timeB0.3Response timeB0.3Response timeB0.6RFambient conditions-noiseBRFambient conditions-reflectionBProbe positioned mech. restrictionsB0.8Probe positioning with respect to phantom shellB4.0Post-processingB4.0Device holder uncertaintyA3.3Device holder uncertaintyB5.0Phantom uncertaintyB5.0Liquid conductivity (target)A2.06	Inded uncertainty idence interval of) $u_e = 2u_c$ Image: second structure interval of $u_e = 2u_c$ 2 Measurement UDENTIAL SAR 1 Error DescriptionType $uueUncertaintyvalueProbablyDistributionSurement systemProbe calibrationB6.55NIsotropyB4.7RBoundary effectB2.0RBoundary effectB0.3RCection limitB0.3RReadout electronicsB0.3RResponse timeB0.0RRFambientconditions-noiseB0.8RProbe positionedmech. restrictionsB0.8RProbe positioningwith respect tophantom shellB0.0RTest samplepositioningB4.0RDevice holderuncertaintyA3.4NDrift of outputpowerB5.0RInductivity(target)B5.0RPatternet and set-upPhantom uncertaintyB4.0RLiquid conductivity(target)B5.0RLiquid conductivity(target)R3.2ConditionConditions-reflectionPhantom uncertaintyB4.0RConditions-reflectionPhantom uncertaintyConditions-reflectionPhantom uncertaintyConditions-reflectionPha$	Inded uncertainty idence interval of) $u_e = 2u_e$ Image: Construct of the construction of the construct	Inded uncertainty idence interval of) $u_e = 2u_e$ Image: Construction $u_e = 2u_e$ Image: Construction Probably DistributionDiv. C(Ci) $1g$ 2 Measurement Urcertainty Fror DescriptionType $ValueUncertaintyProbablyDistributionDiv.1g(Ci)1gsurement systemImage: ConstructionValueB6.55N11IsotropyB4.7R\sqrt{3}1Boundary effectB2.0R\sqrt{3}1Detection limitB1.0R\sqrt{3}1Readout electronicsB0.3R\sqrt{3}1Response timeB0.8R\sqrt{3}1Integration timeB0.6R\sqrt{3}1RFambientconditions-reflectionB0.8R\sqrt{3}1Probe positionedmech. restrictionsB0.8R\sqrt{3}1Probe positionedmech. restrictionsB0.8R\sqrt{3}1Probe positionedmech. restrictionsB0.7\sqrt{3}1Probe positionedmech. restrictionsB0.7\sqrt{3}1Probe positionedmech. restrictionsB0.0\sqrt{3}1Probe positionedmech. restrictionsB0.7\sqrt{3}1Probe positionedmech. restrictionsB0.7\sqrt{3}1Probe positioningpositioningA3.3N11$	Image <t< td=""><td>Index uncertainty index interval of) Image with $u_x = 2u_x$ Image with u_x Image with u</td><td>Image: constraint of the section of the se</td></t<>	Index uncertainty index interval of) Image with $u_x = 2u_x$ Image with u_x Image with u	Image: constraint of the section of the se	

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	Liquid permittivity									
20	(target)	В	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	8
21	Liquid permittivity (meas.)	А	1.6	Ν	1	0.6	0.49	1.0	0.8	521
(Combined standard uncertainty		$\sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					10.7	10.6	257
-	nded uncertainty fidence interval of	I	$u_e = 2u_c$					21.4	21.1	
15.	3 Measurement U	ncerta	intv for Fa	st SAR Tes	ts (30	омн	z~3G	Hz)		
No.	Error Description	Туре	Uncertainty	Probably	Div.	(Ci)	(Ci)	Std.	Std.	Degree
	1	51	value	Distribution		1g	10g	Unc.	Unc.	of
						0	0	(1g)	(10g)	freedo
								× U/	× 0,	m
Mea	surement system	1			1	1	1	1	1	
1	Probe calibration	В	6.0	Ν	1	1	1	6.0	6.0	∞
2	Isotropy	В	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	В	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	8
4	Linearity	В	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	8
5	Detection limit	В	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	8
6	Readout electronics	В	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	В	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	В	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	В	0	R	$\sqrt{3}$	1	1	0	0	8
10	RF ambient conditions-reflection	В	0	R	$\sqrt{3}$	1	1	0	0	œ
11	Probe positioned mech. Restrictions	В	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	œ
12	Probe positioning with respect to phantom shell	В	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	8
13	Post-processing	В	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	8
14	Fast SAR z-Approximation	В	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	8
			Test	sample related	1					
15	Test sample positioning	А	3.3	Ν	1	1	1	3.3	3.3	71
16	Device holder uncertainty	А	3.4	Ν	1	1	1	3.4	3.4	5
17	Drift of output power	В	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞

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Phantom and set-up										
18	Phantom uncertainty	В	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	В	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	œ
20	Liquid conductivity (meas.)	А	2.06	Ν	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	В	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	œ
22	Liquid permittivity (meas.)	А	1.6	N	1	0.6	0.49	1.0	0.8	521
0	Combined standard uncertainty	<i>u</i> _c =	$\sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$					10.4	10.3	257
(conf 95 %	•		$u_e = 2u_c$					20.8	20.6	
15.4	4 Measurement U	ncerta	inty for Fa	st SAR Tes	ts (3-	-6GH	z)			·
No.	Error Description	Туре	Uncertainty	Probably	Div.	(Ci)	(Ci)	Std.	Std.	Degree
			value	Distribution		1g	10g	Unc.	Unc.	of
								(1g)	(10g)	freedo
										m
	surement system									
1	Probe calibration	В	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	В	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	В	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	В	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	В	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	В	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	В	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	В	0	R	$\sqrt{3}$	1	1	0	0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
10	RF ambient conditions-reflection	В	0	R	$\sqrt{3}$	1	1	0	0	œ
11	Probe positioned mech. Restrictions	В	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	œ
12	Probepositioningwithrespecttophantomshell	В	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	В	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	В	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	8
Test sample related										
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15	Test sample positioning	А	3.3	Ν	1	1	1	3.3	3.3	71
16	Device holder uncertainty	А	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	В	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
			Phant	tom and set-uj	р					
18	Phantom uncertainty	В	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	В	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	А	2.06	Ν	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	В	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	А	1.6	Ν	1	0.6	0.49	1.0	0.8	521
(Combined standard uncertainty	<i>u</i> _c =	$= \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$					13.5	13.4	257
_	nded uncertainty idence interval of	ı	$u_e = 2u_c$					27.0	26.8	

16 MAIN TEST INSTRUMENTS

Table 16.1: List of Main Instruments

No.	Name	Туре	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 26, 2016	One year
02	Power meter	NRVD	102196	March 03, 2016	One year
03	Power sensor	NRV-Z5	100596	March 03, 2010	One year
04	Signal Generator	E4438C	MY49071430	February 01, 2016	One Year
05	Amplifier	60S1G4	0331848	No Calibration R	equested
06	BTS	E5515C	MY50263375	January 30, 2016	One year
07	E-field Probe	SPEAG EX3DV4	3617	August 26, 2015	One year
08	DAE	SPEAG DAE4	777	August 26, 2015	One year
09	Dipole Validation Kit	SPEAG D835V2	4d069	July 23, 2015	One year
10	Dipole Validation Kit	SPEAG D1900V2	5d101	July 23, 2015	One year
11	E-field Probe	SPEAG EX3DV4	7307	February19, 2016	One year
12	DAE	SPEAG DAE4	1331	January 21, 2016	One year
13	Dipole Validation Kit	SPEAG D835V2	4d069	July20, 2016	One year
14	Dipole Validation Kit	SPEAG D1900V2	5d101	July28, 2016	One year

END OF REPORT BODY



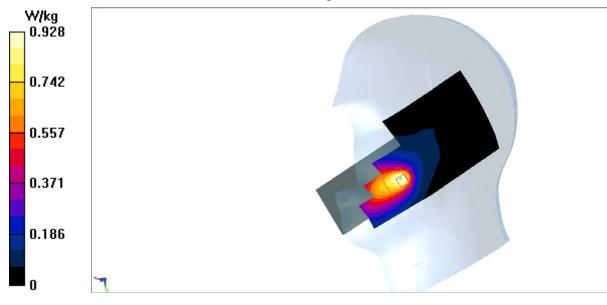
ANNEX A Graph Results

GSM850 Right Cheek High

Date: 2016-11-10 Electronics: DAE4 Sn1331 Medium: Head 850 MHz Medium parameters used (interpolated): f = 848.8 MHz; $\sigma = 0.938$ mho/m; $\epsilon r = 42.746$; $\rho = 1000 \text{ kg/m}^3$ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3 Probe: EX3DV4 – SN7307 ConvF(10.01, 10.01, 10.01)

Area Scan (61x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 1.14 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 3.536 V/m; Power Drift = 0.18 dB Peak SAR (extrapolated) = 1.93 W/kg SAR(1 g) = 0.793 W/kg; SAR(10 g) = 0.454 W/kg Maximum value of SAR (measured) = 0.928 W/kg







GSM850 Body Rear closed High

Date: 2016-7-22 Electronics: DAE4 Sn777 Medium: Body 850 MHz Medium parameters used (interpolated): f = 848.8 MHz; $\sigma = 0.932$ mho/m; $\epsilon r = 56.413$; $\rho = 1000 \text{ kg/m}^3$ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:2.67 Probe: EX3DV4 - SN3617 ConvF(9.71, 9.71, 9.71)

Area Scan (91x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 1.67 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 40.25 V/m; Power Drift = -0.08 dB Peak SAR (extrapolated) = 1.87 W/kg SAR(1 g) = 1.42 W/kg; SAR(10 g) = 1.02 W/kg Maximum value of SAR (measured) = 1.59 W/kg

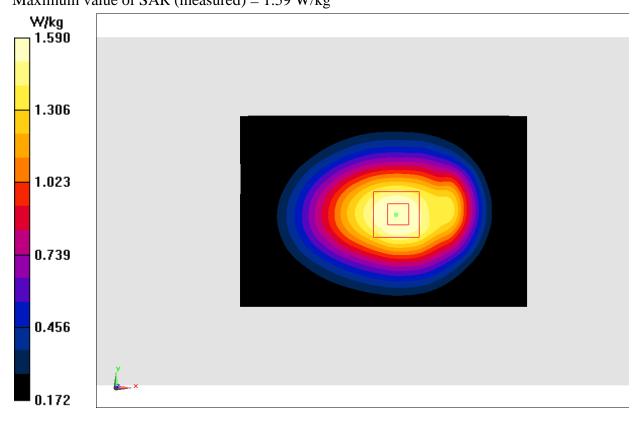


Fig.2 GSM850 MHz



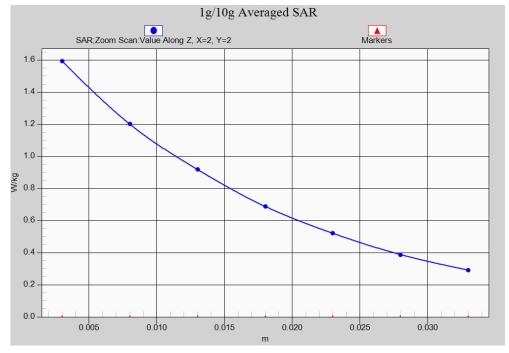


Fig. 2-1 Z-Scan at power reference point (850 MHz)



PCS1900 Right Cheek Middle

Date: 2016-7-13 Electronics: DAE4 Sn777 Medium: Head 1900 MHz Medium parameters use (interpolated): f = 1880 MHz; $\sigma = 1.417$ mho/m; $\epsilon r = 40.568$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3 Probe: EX3DV4 - SN3617 ConvF(8.07, 8.07, 8.07)

Area Scan (61x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 0.428 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 3.459 V/m; Power Drift = -0.05 dB Peak SAR (extrapolated) = 0.511 W/kg SAR(1 g) = 0.343 W/kg; SAR(10 g) = 0.215 W/kg Maximum value of SAR (measured) = 0.387 W/kg

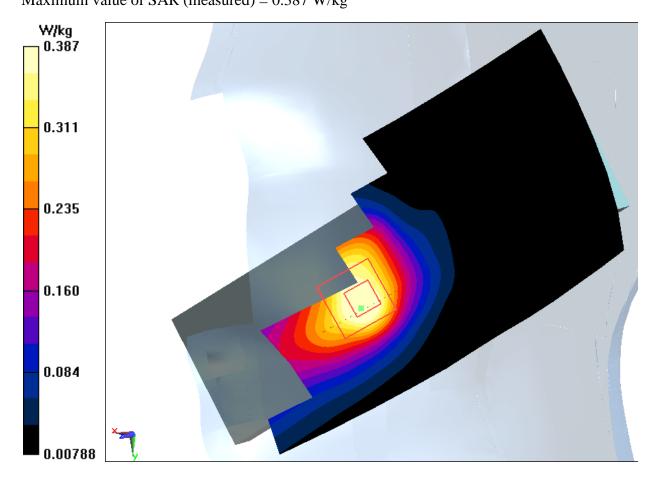


Fig.3 PCS1900 MHz



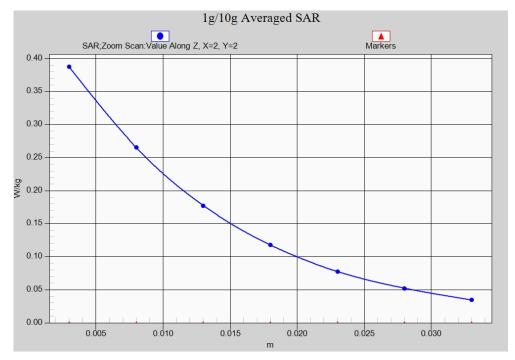


Fig. 3-1 Z-Scan at power reference point (1900 MHz)



PCS1900 Body Rear closed Low

Date: 2016-7-13 Electronics: DAE4 Sn777 Medium: Body 1900 MHz Medium parameters used (interpolated): f = 1850.2 MHz; $\sigma = 1.561$ mho/m; $\epsilon r = 52.743$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2.67 Probe: EX3DV4 - SN3617 ConvF(7.74, 7.74, 7.74)

Area Scan (91x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 1.22 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 16.42 V/m; Power Drift = -0.05 dB Peak SAR (extrapolated) = 1.55 W/kg SAR(1 g) = 0.975 W/kg; SAR(10 g) = 0.581 W/kg Maximum value of SAR (measured) = 1.17 W/kg

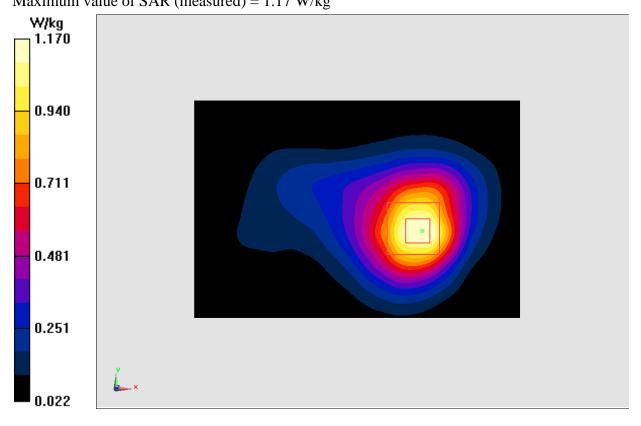


Fig.4 PCS1900 MHz



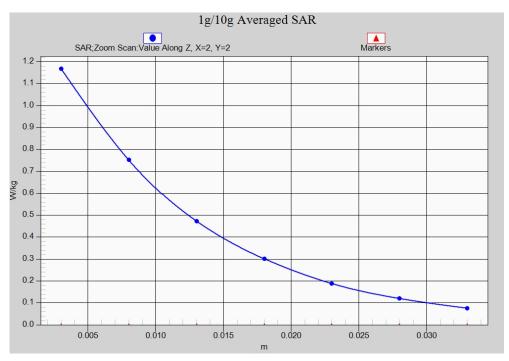


Fig.4-1 Z-Scan at power reference point (1900 MHz)



ANNEX B SystemVerification Results

835MHz

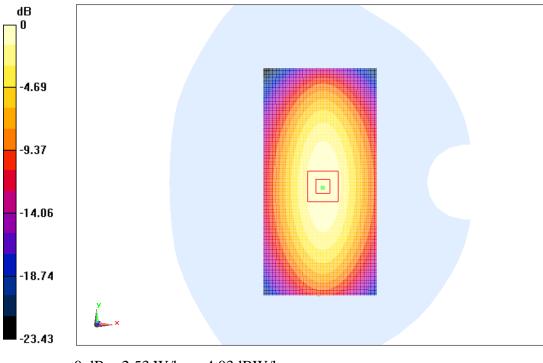
Date: 2016-07-22 Electronics: DAE4 Sn777 Medium: Head 850 MHz Medium parameters used: f = 835 MHz; $\sigma = 0.924$ S/m; $\epsilon_r = 41.23$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN3617 ConvF(9.56, 9.56, 9.56)

System Validation /Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 51.281 V/m; Power Drift = 0.07 dB Fast SAR: SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.47 W/kg Maximum value of SAR (interpolated) = 2.50 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.281 V/m; Power Drift = 0.07 dB Peak SAR (extrapolated) = 3.58 W/kg SAR(1 g) = 2.27 W/kg; SAR(10 g) = 1.49 W/kg

Maximum value of SAR (measured) = 2.53 W/kg



0 dB = 2.53 W/kg = 4.03 dBW/kg

Fig.B.1 validation 835MHz 250mW

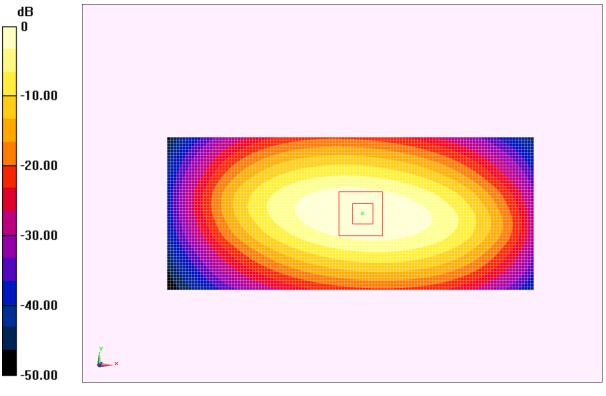


Date: 2016-07-22 Electronics: DAE4 Sn777 Medium: Body 850 MHz Medium parameters used: f = 835 MHz; $\sigma = 0.947$ S/m; $\epsilon_r = 56.37$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN3617 ConvF(9.71, 9.71, 9.71)

System Validation /Area Scan (81x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 51.697 V/m; Power Drift = 0.05 dB Fast SAR: SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.53 W/kg Maximum value of SAR (interpolated) = 2.51 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 51.697 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 3.52 W/kg SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.54 W/kg Maximum value of SAR (measured) = 2.53 W/kg



0 dB = 2.53 W/kg = 4.03 dBW/kg

Fig.B.2 validation 835MHz 250mW



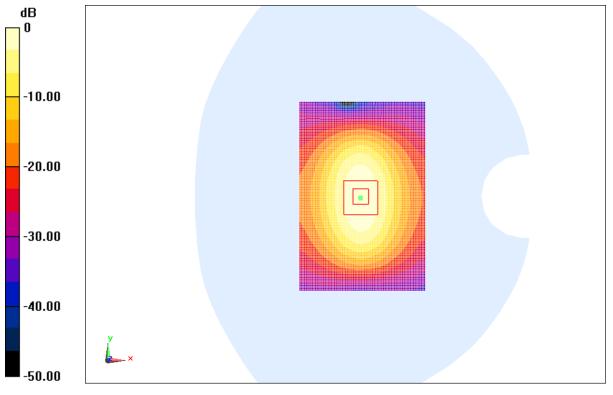
Date: 2016-07-13 Electronics: DAE4 Sn777 Medium: Head 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.409$ S/m; $\varepsilon_r = 40.69$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1 Probe: EX3DV4 - SN3617 ConvF(8.07, 8.07, 8.07)

System Validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 91.803 V/m; Power Drift = -0.05 dB Fast SAR: SAR(1 g) = 10.7 W/kg; SAR(10 g) = 5.67 W/kg Maximum value of SAR (interpolated) = 12.1 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 91.803 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 19.11 W/kgSAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.52 W/kg

Maximum value of SAR (measured) = 11.9 W/kg



0 dB = 11.9 W/kg = 10.76 dBW/kg

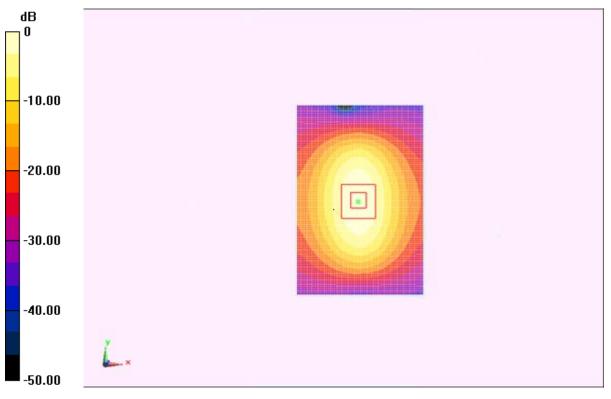
Fig.B.3 validation 1900MHz 250mW



Date: 2016-07-13 Electronics: DAE4 Sn777 Medium: Body 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.575$ S/m; $\epsilon_r = 52.62$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN3617 ConvF(7.74, 7.74, 7.74)

System validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 60.572 V/m; Power Drift = 0.05 dB Fast SAR: SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.66 W/kg Maximum value of SAR (interpolated) = 12.6 W/kg

System validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 60.572 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 19.26 W/kg SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.49 W/kg Maximum value of SAR (measured) = 12.4 W/kg



0 dB = 12.4 W/kg = 10.93 dBW/kg

Fig.B.4 validation 1900MHz 250mW

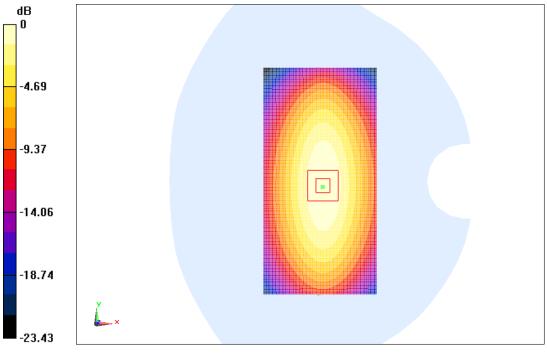


Date: 2016-11-10 Electronics: DAE4 Sn1331 Medium: Head 850 MHz Medium parameters used: f = 835 MHz; $\sigma = 0.925$ S/m; $\epsilon_r = 42.93$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN7307 ConvF(10.01, 10.01, 10.01)

System Validation /Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 51.522 V/m; Power Drift = -0.09 dB Fast SAR: SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.47 W/kg Maximum value of SAR (interpolated) = 2.52 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 51.522 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 3.6 W/kg SAR(1 g) = 2.29 W/kg; SAR(10 g) = 1.5 W/kg

Maximum value of SAR (measured) = 2.55 W/kg



0 dB = 2.55 W/kg = 4.07 dBW/kg



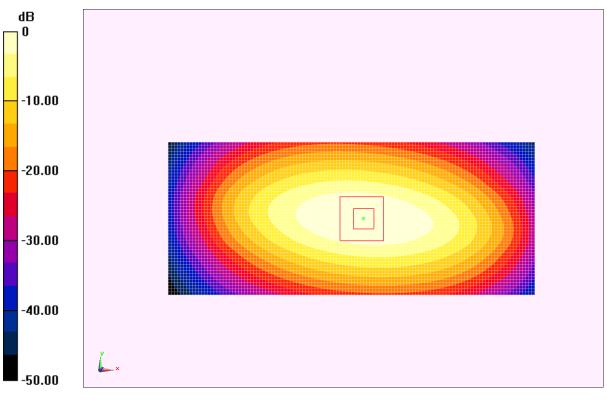


Date: 2016-11-10 Electronics: DAE4 Sn1331 Medium: Body 850 MHz Medium parameters used: f = 835 MHz; $\sigma = 0.953$ S/m; $\epsilon_r = 56.61$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN7307 ConvF(9.83, 9.83, 9.83)

System Validation /Area Scan (81x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 51.907 V/m; Power Drift = 0.07 dB Fast SAR: SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.54 W/kg Maximum value of SAR (interpolated) = 2.52 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 51.907 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 3.54 W/kgSAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.56 W/kgMaximum value of SAR (measured) = 2.54 W/kg



0 dB = 2.54 W/kg = 4.05 dBW/kg

Fig.B.6 validation 835MHz 250mW

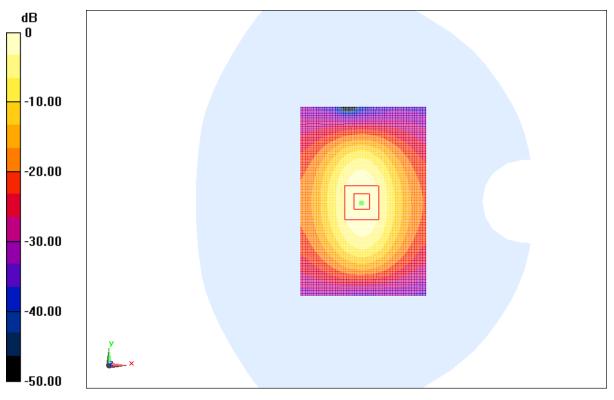


Date: 2016-11-11 Electronics: DAE4 Sn1331 Medium: Head 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.427$ S/m; $\varepsilon_r = 40.37$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN7307 ConvF(8.10, 8.10, 8.10)

System Validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 90.624 V/m; Power Drift = -0.03 dB Fast SAR: SAR(1 g) = 10.6 W/kg; SAR(10 g) = 5.53 W/kg Maximum value of SAR (interpolated) = 12.0 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 90.624 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 18.95 W/kg SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.38 W/kg Maximum value of SAR (measured) = 11.8 W/kg



0 dB = 11.8 W/kg = 10.72 dBW/kg

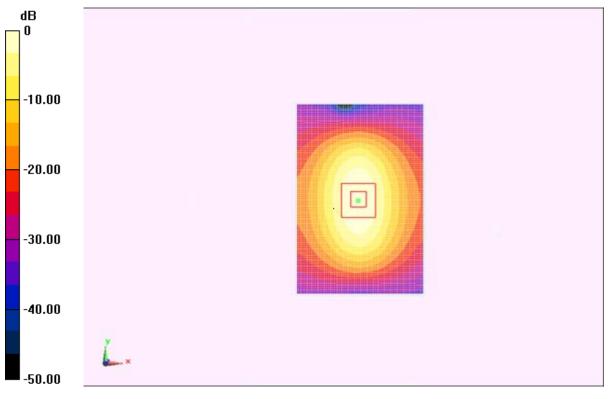
Fig.B.7 validation 1900MHz 250mW



Date: 2016-11-11 Electronics: DAE4 Sn1331 Medium: Body 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.545$ S/m; $\epsilon_r = 54.27$; $\rho = 1000$ kg/m³ Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1 Probe: EX3DV4 – SN7307 ConvF(7.67, 7.67, 7.67)

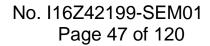
System validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Reference Value = 60.246 V/m; Power Drift = 0.06 dB Fast SAR: SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.62 W/kg Maximum value of SAR (interpolated) = 12.6 W/kg

System validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 60.246 V/m; Power Drift = 0.06 dB Peak SAR (extrapolated) = 19.23 W/kg SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.45 W/kg Maximum value of SAR (measured) = 12.4 W/kg



0 dB = 12.4 W/kg = 10.93 dBW/kg

Fig.B.8 validation 1900MHz 250mW





The SAR system verification must be required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR.

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2016-07-22	835	Head	2.25	2.27	-0.88
	835	Body	2.34	2.37	-1.27
2016-07-13	1900	Head	10.7	10.5	1.90
	1900	Body	10.5	10.3	1.94
2016-11-10	835	Head	2.25	2.29	-1.75
	835	Body	2.35	2.38	-1.26
2016-11-11	1900	Head	10.6	10.4	1.92
	1900	Body	10.5	10.3	1.94

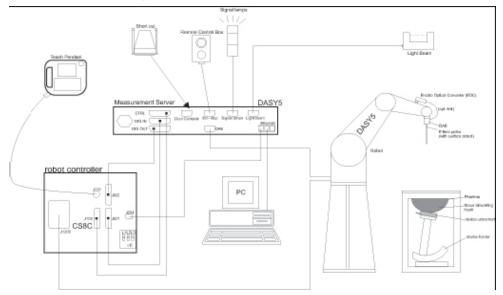
Table B.1 Comparison between area scan and zoom scan for system verification



ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

The Dasy4 or DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (StäubliTX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY4 or DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.