

Page: 1 of 319

## SAR TEST REPORT

The following samples were submitted and identified on behalf of the client as:

**Equipment Under Test** Mobile Phone

Brand Name Sony

**Type No.** PM-0852-BV

Company Name Sony Mobile Communications AB

Company Address Nya Vattentornet 22188 Lund/SWEDEN

**Standards** IEEE /ANSI C95.1, C95.3, IEEE 1528, KDB447498D01v05r02,

KDB248227D01v01r02,KDB941225D01v03,

KDB941225D05v02r03,KDB941225D06v02,KDB865664D01v

01r03, KDB865664D02v01r01, KDB648474D04v01r02.

FCC ID PY7-PM0852

Date of Receipt Nov. 11, 2014

**Date of Test(s)** Nov. 16, 2014 ~ Dec. 01, 2014

Date of Issue Jan. 19, 2015

In the configuration tested, the EUT complied with the standards specified above.

#### Remarks:

This report details the results of the testing carried out on three samples, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Electronic & Communication Laboratory or testing done by SGS Taiwan Electronic & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronic & Communication Laboratory in writing.

Signed on behalf of SGS				
Sr. Engineer	Supervisor			
Kevin Li	Ricky Huang			
Date: Jan. 19, 2015	Date: Jan. 19, 2015			

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Page: 2 of 319

## Version

Report Number	Revision	Description	Issue Date
E5/2014/B0017	00	Initial Version	Jan. 08, 2015
E5/2014/B0017	01	1 <sup>st</sup> modification	Jan. 16, 2015
E5/2014/B0017	02	2 <sup>nd</sup> modification	Jan. 19, 2015

This test report contains a reference to the previous version test report that it replaces.

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Page: 3 of 319

# **Contents**

1. General Information	4
1.1 Testing Laboratory	4
1.2 Details of Applicant	4
1.3 Description of EUT	5
1.4 Test Environment	52
1.5 Operation Description	52
1.6 Positioning Procedure	57
1.7 Evaluation Procedures	58
1.8 Probe Calibration Procedures	60
1.9 The SAR Measurement System	63
1.10 System Components	65
1.11 SAR System Verification	67
1.12 Tissue Simulant Fluid for the Frequency Band	69
1.13 Test Standards and Limits	74
2. Summary of Results	76
3. Simultaneous Transmission Analysis	97
4. Instruments List	118
5. Measurements	120
6. System Verification	166
7. DAE & Probe Calibration Certificate	193
8. Uncertainty Budget	255
9. Phantom Description	256
10. System Validation from Original Equipment Supplier	257

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Page: 4 of 319

### 1. General Information

#### 1.1 Testing Laboratory

SGS Taiwan Ltd. El	SGS Taiwan Ltd. Electronics & Communication Laboratory		
No.134, Wu Kung F	No.134, Wu Kung Road, New Taipei Industrial Park		
Wuku District, New	Wuku District, New Taipei City, Taiwan		
Tel	+886-2-2299-3279		
Fax +886-2-2298-0488			
Internet	http://www.tw.sgs.com/		

#### 1.2 Details of Applicant

Company Name	Sony Mobile Communications AB
Company Address	Nya Vattentornet 22188 Lund/SWEDEN

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Page: 5 of 319

### 1.3 Description of EUT

escription of	LUI				
EUT Name	Mobile Phone				
Brand Name	Sony				
Type No.	PM-0852-BV				
HW Version	A				
SW Version	25.0.A.0.33				
	2G/3G: ZH8005X8BA				
Serial No.	LTE: ZH8005X8BJ				
	WLAN: ZH8005X1CM				
	2G/3G: 004402453551875				
IMEI Code	LTE: 004402453551685				
	WLAN: 004402453551651				
FCC ID	PY7-PM0852				
Mode of	$\square$ GSM $\square$ GPRS $\square$ EDGE	<b>—</b>			
Operation	HSUPA HSPA+ LTE I				
	WLAN802.11 a/b/g/n (20M/40M)	⊠Bluetooth			
	GSM	1/8.3			
	GPRS	1/2 (1Dn4UP)			
	(support multi class 12 max)	1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP)			
	(Support muiti class 12 max)	1/8.3 (1Dn1UP)			
		1/2 (1Dn4UP)			
Durter Carolo	EDGE	1/2.76 (1Dn3UP)			
Duty Cycle	(support multi class 12 max)	1/4.1 (1Dn2UP)			
	,	1/8.3 (1Dn1UP)			
	WCDMA	1			
	LTE	1			
	WLAN 802.11 a/b/g/n(20M/40M)	1			
	Bluetooth	1			

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Page: 6 of 319

	GSM850	824.2		848.8
	GSM1900	1850.2		1909.8
	WCDMA Band II	1852.4	_	1907.6
	WCDMA Band IV	1712.4	_	1752.6
	WCDMA Band V	826.4		846.6
	LTE FDD Band II	1850		1910
	LTE FDD Band IV	1710	_	1755
	LTE FDD Band V	824	_	849
	LTE FDD Band VII	2500		2570
	LTE FDD Band XII	699		716
TX Frequency	LTE FDD Band XIII	777		787
Range	LTE FDD Band XVII	704	_	716
(MHz)	WLAN 802.11 b/g/n(20M)	2412	_	2462
	WLAN 802.11 n(40M)	2422		2452
	WLAN802.11 a/n(20M) 5.2G	5180		5240
	WLAN802.11 a/n(20M) 5.3G	5260	_	5320
	WLAN802.11 a/n(20M) 5.5G	5500		5700
	WLAN802.11 a/n(20M) 5.8G	5745		5825
	WLAN802.11 n(40M) 5.2G	5190	_	5230
	WLAN802.11 n(40M) 5.3G	5270		5310
	WLAN802.11 n(40M) 5.5G	5510		5670
	WLAN802.11 n(40M) 5.8G	5755		5795
	Bluetooth	2402		2480

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Page: 7 of 319

	GSM850	128		251
	GSM1900	512		810
	WCDMA Band II	9262		9538
	WCDMA Band IV	1312		1513
	WCDMA Band V	4132		4233
	LTE FDD Band II	18607		19193
	LTE FDD Band IV	19957		20393
	LTE FDD Band V	20407	_	20643
	LTE FDD Band VII	20775	_	21425
	LTE FDD Band XII	23007		23173
Channel	LTE FDD Band XIII	23205		23255
Number	LTE FDD Band XVII	23755		23825
(ARFCN)	WLAN 802.11 b/g/n(20M)	1		11
	WLAN 802.11 n(40M)	3		9
	WLAN802.11 a/n(20M) 5.2G	36		48
	WLAN802.11 a/n(20M) 5.3G	52	_	64
	WLAN802.11 a/n(20M)5.6G	100	_	140
	WLAN802.11 a/n(20M)5.8G	149	_	165
	WLAN802.11 n(40M) 5.2G	38	_	46
	WLAN802.11 n(40M) 5.3G	54		62
	WLAN802.11 n(40M) 5.6G	102		134
	WLAN802.11 n(40M) 5.8G	151		159
	Bluetooth	0		78

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Page: 8 of 319

Max. SAR (1 g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GSM 850	0.602	0.66		
	GSM 1900	0.194	0.213	☐Left ☐Right ☐Cheek ☐Tilt 810 Channel	
	WCDMA Band II	0.352	0.36	☐Left ☐Right ☐Cheek ☐Tilt ☐9538 Channel	
	WCDMA Band IV	0.43	0.437	☐Left ☐Right ☐Cheek ☐Tilt ☐1412 Channel	
	WCDMA Band V	0.552	0.605		
Head	LTE FDD Band II	0.453	0.469	<pre></pre>	
	LTE FDD Band IV	0.615	0.616	<pre></pre>	
	LTE FDD Band V	0.581	0.597	<pre></pre>	
	LTE FDD Band VII	0.183	0.189	☐Left ☐Right ☐Cheek ☐Tilt ☐ 20850 Channel	
	LTE FDD Band XII	0.042	0.048		
	LTE FDD Band XIII	0.274	0.288	<pre></pre>	

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Page: 9 of 319

Max. SAR (1 g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	LTE FDD Band XVII	0.038	0.041	<ul><li>☐Left ☐ Right</li><li>☐Cheek ☐ Tilt</li><li>23790 Channel</li></ul>	
	WLAN802.11 b	0.587	0.612	☐Left ☐Right ☐Cheek ☐Tilt ☐Channel	
	WLAN802.11a 5.2G	0.249	0.25	☐Left ☐Right ☐Cheek ☐Tilt ☐36 Channel	
Head	WLAN802.11a 5.3G	0.218	0.219	☐Left ☐Right ☐Cheek ☐Tilt <u>64</u> Channel	
	WLAN802.11a 5.6G	0.48	0.482	☐Left ☐Right ☐Cheek ☐Tilt ☐ 132 Channel	
	WLAN802.11a 5.8G	0.493	0.512	□Left ⊠Right □Cheek □Tilt □161 Channel	

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Page: 10 of 319

Max. SAR (1 g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GSM 850	0.399	0.418	☐Front ☐Back 251 Channel	
	GSM 1900	0.314	0.369	☐Front ☐Back 512 Channel	
	WCDMA Band II	0.563	0.576	Front Back 9538 Channel	
	WCDMA Band IV	0.59	0.6	Front Back 1412 Channel	
	WCDMA Band V	0.429	0.47	Front Back 4233 Channel	
	LTE FDD Band II	0.743	0.769	☐Front ☐Back 19100 Channel	
	LTE FDD Band IV	0.679	0.681	Front Back 20050 Channel	
Body worn	LTE FDD Band V	0.506	0.521	Front Back 20600 Channel	
(speech mode)	LTE FDD Band VII	0.559	0.563	Front Back 21350 Channel	
	LTE FDD Band XII	0.073	0.083	Front Back 23090 Channel	
	LTE FDD Band XIII	0.442	0.464	Front Back 23230 Channel	
	LTE FDD Band XVII	0.059	0.065	Front Back 23780 Channel	
	WLAN802.11a 5.2G	0.341	0.342	☐Front ☐Back 36Channel	
	WLAN802.11a 5.3G	0.319	0.32	Front Back 64 Channel	
	WLAN802.11a 5.6G	0.382	0.384	☐Front ☐Back 132 Channel	
	WLAN802.11a 5.8G	0.298	0.311	☐Front ☐Back 165_Channel	

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Page: 11 of 319

Max. SAR (1 g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GPRS 850 (1Dn1UP)	0.702	0.77	☐Front ☐Back ☐Bottom ☐Right ☐Left190Channel	
	GPRS 1900 (1Dn1UP)	0.662	0.726	☐Front ☐Back ☐Bottom ☐Right ☐Left810Channel	
	WCDMA Band II	1.34	1.371	☐Front ☐Back ☐Bottom ☐Right ☐Left9538 _Channel	
Hotspot	WCDMA Band IV	1.35	1.397	☐Front ☐Back ☐Bottom ☐Right ☐Left1513Channel -repeat with worse case	
mode	WCDMA Band V	0.925	1.014	☐Front ☐Back ☐Bottom ☐Right ☐Left	
	LTE FDD Band II	1.33	1.432	☐Front ☐Back ☐Bottom ☐Right ☐Left	
	LTE FDD Band IV	1.08	1.212	<pre> Front</pre>	
	LTE FDD Band V	0.832	0.863	☐Front ☐Back ☐Bottom ☐Right ☐Left	

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Page: 12 of 319

	Max. SAR	(1 g) (Uni	t: W/Kg)	
Mode	Band	Measured	Reported	Position / Channel
	LTE FDD Band VII	1.13	1.138	☐Front ☐Back ☐Bottom ☐Right ☐Left21350 _Channel
Hotspot mode	LTE FDD Band XII	0.111	0.127	☐Front ☐Back ☐Bottom ☐Right ☐Left
	LTE FDD Band XIII	0.594	0.623	☐Front ☐Back ☐Bottom ☐Right ☐Left
	LTE FDD Band XVII	0.084 0.092		☐Front ☐Back ☐Bottom ☐Right ☐Left23780 Channel
	WLAN802.11b	0.638	0.665	☐Front ☐Back ☐Bottom ☐Right ☐Left11Channel

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Page: 13 of 319

#### #. Conducted power table:

#### **GSM/GPRS/EDGE** conducted power table:

EUT mode	Frequency	011	~	Burst average power	Source-based time average power			
	(MHz)	СН	Power + Max. Tolerance (dBm)	Avg.(dBm)	Avg.(dBm)			
GSM 850	824.2	128	33.5	33.00	23.97			
(GMSK)	836.6	190	33.5	33.10	24.07			
(GIVISK)	848.8	251	33.5	33.30	24.27			
	The div	ision f	actor compared to	the number of TX time slot				
	Divisio	n facto	or	1 TX time slot				
	טואוט	iii iacto	וע	-9.03				

			Burst avera	age power		
	ted Avg. Powe olerance (dBr		33.5	30.5	28.5	27.5
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz) CH		Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 850	824.2	128	33.00	29.50	27.70	26.50
(GMSK)	836.6	190	33.10	29.50	27.70	26.60
(GIVISK)	848.8	251	33.30	29.50	27.70	26.90
		S	ource-based tim	e average powe	r	
GPRS 850	824.2	128	23.97	23.48	23.44	23.49
(GMSK)	836.6	190	24.07	23.48	23.44	23.59
(GIVISK)	848.8	251	24.27	23.48	23.44	23.89
	The div	ision fa	actor compared	to the number of	of TX time slot	
Division factor			1 TX time slot 2 TX time slot -9.03 -6.02		3 TX time slot -4.26	4 TX time slot -3.01

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Page: 14 of 319

			D 1						
			Burst avera	age power					
	ted Avg. Powe olerance (dBr		28	25.5	25	25			
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP			
EUT mode	Frequency CH (MHz)		Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)			
EDGE 850	824.2	128	27.70	25.00	24.90	24.70			
(MCS 5)	836.6	190	27.60	25.00	24.90	24.70			
(IVICS 5)	848.8 251		27.80	25.00	25.00	24.90			
		S	ource-based tim	urce-based time average power					
EDGE 850	824.2	128	18.67	18.98	20.64	21.69			
(MCS 5)	836.6	190	18.57	18.98	20.64	21.69			
(IVICS 5)	848.8	251	18.77	18.98	20.74	21.89			
	The div	ision fa	actor compared	to the number o	of TX time slot				
Div	ision factor		1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot			
DIV	rision ractor		-9.03	-6.02	-4.26	-3.01			

	Burst average power											
Max. Rated Avg. Power + Max. Tolerance (dBm)			30.5	28.5	27.5							
		1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP							
equency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)							
824.2	128	33.00	29.50	27.70	26.50							
836.6	190	33.10	29.50	27.70	26.60							
848.8 251		33.20	29.50	27.70	26.80							
	Ç	Source-based tir	ne average pow	er								
824.2	128	23.97	23.48	23.44	23.49							
836.6	190	24.07	23.48	23.44	23.59							
848.8	251	24.17	23.48	23.44	23.79							
The div	vision f	factor compared	to the number	of TX time slot								
Division factor				3 TX time slot	4 TX time slot -3.01							
	quency MHz) 324.2 336.6 348.8 324.2 336.6 348.8 The di	quency CH MHz) 224.2 128 336.6 190 348.8 251 336.6 190 348.8 251 The division to	1Dn1UP   Avg.   (dBm)   33.5	1Dn1UP   1Dn2UP   Avg.   Avg.   (dBm)   (dBm	1Dn1UP   1Dn2UP   1Dn3UP   1							

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Page: 15 of 319

			Burst avera	age power					
	ted Avg. Powe olerance (dBr		28	25.5	25	25			
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP			
EUT mode	Frequency CH (MHz)		Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)			
EDGE 850	824.2	128	27.70	25.00	24.90	24.70			
(MCS 9)	836.6	190	27.60	25.00	24.90	24.70			
(10103 9)	848.8	251	27.70	25.00	25.00	24.90			
		S	ource-based tim	ırce-based time average power					
EDGE 850	824.2	128	18.67	18.98	20.64	21.69			
(MCS 9)	836.6	190	18.57	18.98	20.64	21.69			
(10103 9)	848.8	251	18.67	18.98	20.74	21.89			
	The div	ision fa	actor compared	to the number of	of TX time slot				
Div	ision factor		1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot			
DIV	יוטווי ומכנטו		-9.03	-6.02	-4.26	-3.01			

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Page: 16 of 319

EUT mode	Frequency	CII	Max. Rated Avg. Power + Max.	Burst average power	Source-based time average power		
EUT Mode	(MHz)	СН	Tolerance (dBm)	Avg.(dBm)	Avg.(dBm)		
GSM 1900	1850.2	512	30.5	29.80	20.77		
(GMSK)	1880	661	30.5	29.90	20.87		
(GIVISK)	1909.8	810	30.5	30.10	21.07		
	The divi	ision fa	ctor compared to	the number of TX time	e slot		
	Division	factor		1 TX time slot			
	DIVISION	Tactor		-9.	03		

			Burst avera	age power					
		ed Avg. Power + blerance (dBm)		27	25	24.5			
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP			
EUT mode	Frequency CH		Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)			
GPRS	1850.2	512	29.80	26.50	24.70	23.70			
1900	1880	661	29.90	26.50	24.70	23.80			
(GMSK)	1909.8	810	30.10	26.50	24.70	24.00			
		S	ource-based tim	rce-based time average power					
GPRS	1850.2	512	20.77	20.48	20.44	20.69			
1900	1880	661	20.87	20.48	20.44	20.79			
(GMSK)	1909.8	810	21.07	20.48	20.44	20.99			
	The div	ision fa	actor compared	to the number o	of TX time slot				
Division factor				TX time slot 2 TX time slot 3 TX time s					
			-9.03	-6.02	-4.26	-3.01			

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Page: 17 of 319

			Burst avera	age power				
	ted Avg. Powe olerance (dBm		27.5 24.5 23.5		23.5	22.5		
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP		
EUT mode	Frequency CH (MHz)		Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)		
EDGE	1850.2	512	27.10	24.20	23.20	22.10		
1900	1900 1880 661		26.80	24.00	22.90	21.90		
(MCS 5)	1909.8	810	27.00	24.20	24.20 23.10			
			Source-based tim	e average power				
EDGE	1850.2	512	18.07	18.18	18.94	19.09		
1900	1880	661	17.77	17.98	18.64	18.89		
(MCS 5) 1909.8 8 <sup>-2</sup>		810	17.97	18.18	18.84	19.09		
	The d	ivision 1	factor compared	to the number of	TX time slot			
Div	Division factor			TX time slot 2 TX time slot 3 TX time slo		4 TX time slot		
			-9.03	-6.02	-4.26	-3.01		

			Burst aver	age power		
	ed Avg. Powe olerance (dBr		30.5 27		25	24.5
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)		Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
EDGE	1850.2	512	29.80	26.50	24.70	23.70
1900	1880	661	29.90	26.50	24.70	23.80
(MCS 4)	1909.8	810	30.00	26.50	24.70	23.90
		S	ource-based tim	ne average powe	er	
EDGE	1850.2	512	20.77	20.48	20.44	20.69
1900	1880	661	20.87	20.48	20.44	20.79
(MCS 4)	1909.8	810	20.97	20.48	20.44	20.89
	The div	ision fa	actor compared	to the number of	of TX time slot	
Div	Division factor			2 TX time slot	3 TX time slot	4 TX time slot
Div	ision ractor		-9.03	-6.02	-4.26	-3.01

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Page: 18 of 319

			Burst avera	age power						
	ted Avg. Powe olerance (dBm		27.5	27.5 24.5 23.5		22.5				
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP				
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)				
EDGE	1850.2	512 27.10		24.20	23.20	22.10				
1900	1880	661	26.80	24.00	22.90	21.90				
(MCS 9)	1909.8 81		27.00	24.20	24.20 23.10					
		Ç	Source-based tim	ource-based time average power						
EDGE	1850.2	512	18.07	18.18	18.94	19.09				
1900	1880	661	17.77	17.98	18.64	18.89				
(MCS 9)	1909.8	810	17.97	18.18	18.84	19.09				
	The d	ivision 1	factor compared	to the number of	TX time slot					
Div	vision factor	•	1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot				
	VISIOII IACIOI		-9.03	-6.02	-4.26	-3.01				

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Page: 19 of 319

#### WCDMA Band II / Band IV / Band V - HSDPA / HSUPA conducted power table:

Band CH	Max. Rated Avg. Power +	Rated Rel99		HSDPA mode AV(dBm)				HSUPA	HSUPA mode AV(dBm)				HSPA+ mode AV(dBm)				
	СН	Max. Tolerance (dBm)	AV (dBm)	SUB-1	SUB-2	SUB-3	SUB-4	SUB-1	SUB-2	SUB-3	SUB-4	SUB-5	SUB-1	SUB-2	SUB-3	SUB-4	SUB-5
WCDMA	9262	24.5	24.25	23.27	23.13	22.79	22.86	24.17	22.22	23.13	22.35	23.22	24.18	22.16	23.15	22.27	23.98
Band II	9400	24.5	24.17	23.21	23.03	22.76	22.77	24.15	22.22	23.07	22.27	23.15	24.14	22.18	23.13	22.22	23.99
Dallu II	9538	24.5	24.40	23.39	23.25	22.86	22.98	24.34	22.38	23.32	22.42	23.38	24.35	22.34	23.36	22.38	24.21
WCDMA	1312	24.5	24.40	23.35	23.28	22.87	22.94	24.32	22.37	23.18	22.5	23.23	24.22	22.27	23.18	22.4	23.13
Band IV	1412	24.5	24.43	23.34	23.29	22.89	22.9	24.41	22.48	23.33	22.53	23.36	24.30	22.38	23.23	22.43	23.26
Dallu IV	1513	24.5	24.35	23.24	23.20	22.71	22.83	24.29	22.33	23.27	22.37	23.30	24.19	22.23	23.17	22.27	23.20
WCDMA	4132	24.5	24.37	23.31	23.30	22.85	22.9	24.33	22.39	23.27	22.44	23.27	24.34	22.37	23.32	22.40	24.15
Band V	4183	24.5	24.27	23.21	23.16	22.73	22.77	24.20	22.28	23.16	22.34	23.21	24.19	22.21	23.19	22.27	23.96
Dailu V	4233	24.5	24.10	22.99	23.10	22.5	22.56	24.02	22.06	23	22.14	23.01	24.01	21.98	23.00	22.04	23.83

#### **HSDPA**

SUB-TEST	$eta_{c}$	$eta_{\sf d}$	β <sub>d</sub> (SF)	$\beta_{c}/\beta_{d}$	β <sub>HS</sub> (Note1, Note 2)	CM (dB) <i>(Note 3)</i>	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15	15/15	64	12/15	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

#### **HSUPA**

113017													
SUB-TEST	$eta_{c}$	$eta_{ extsf{d}}$	β <sub>d</sub> (SF)	β <sub>c</sub> /β <sub>d</sub>	β <sub>HS</sub> (Note1)	$eta_{ec}$	β <sub>ed</sub> (Note 5) (Note 6)	β <sub>ed</sub> (SF)	β <sub>ed</sub> (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β <sub>ed</sub> 1: 47/15 β <sub>ed</sub> 2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	15/15	64	15/15	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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Page: 20 of 319

### LTE FDD Band II/ Band IV/ Band V/ Band VII/ Band XII/ Band XIII/ Band XVII power table:

	аые.		ſ	FDD Band 2	2			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1860	18700	24.03	24.5	0
			0	1880	18900	24.06	24.5	0
				1900	19100	24.14	24.5	0
				1860	18700	24.07	24.5	0
		1 RB	50	1880	18900	24.09	24.5	0
	QPSK			1900	19100	24.21	24.5	0
				1860	18700	24.08	24.5	0
			99	1880	18900	24.18	24.5	0
				1900	19100	24.35	24.5	0
				1860	18700	23.10	24	0-1
			0	1880	18900	23.16	24	0-1
				1900	19100	23.25	24	0-1
		50.00		1860	18700	23.11	24	0-1
		50 RB	25	1880	18900	23.15	24	0-1
				1900	19100	23.35	24	0-1
				1860	18700	23.15	24	0-1
			50	1880	18900	23.21	24	0-1
				1900	19100	23.46	24	0-1
				1860	18700	23.14	24	0-1
		100	ORB	1880	18900	23.16	24	0-1
20				1900	19100	23.36	24	0-1
20			0	1860	18700	23.50	24	0-1
				1880	18900	23.18	24	0-1
				1900	19100	23.46	24	0-1
				1860	18700	23.23	24	0-1
		1 RB	50	1880	18900	23.41	24	0-1
				1900	19100	23.24	24	0-1
				1860	18700	23.21	24	0-1
			99	1880	18900	23.16	24	0-1
				1900	19100	23.35	24	0-1
				1860	18700	22.15	23	0-2
	16-QAM		0	1880	18900	22.18	23	0-2
				1900	19100	22.25	23	0-2
				1860	18700	22.16	23	0-2
		50 RB	25	1880	18900	22.24	23	0-2
				1900	19100	22.37	23	0-2
				1860	18700	22.21	23	0-2
			50	1880	18900	22.21	23	0-2
				1900	19100	22.41	23	0-2
				1860	18700	22.17	23	0-2
		100	ORB	1880	18900	22.15	23	0-2
				1900	19100	22.35	23	0-2

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Page: 21 of 319

			F	DD Band 2	)			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1857.5	18675	24.05	24.5	0
			0	1880	18900	24.05	24.5	0
				1902.5	19125	24.20	24.5	0
				1857.5	18675	24.05	24.5	0
		1 RB	36	1880	18900	24.11	24.5	0
				1902.5	19125	24.30	24.5	0
				1857.5	18675	24.05	24.5	0
			74	1880	18900	24.19	24.5	0
				1902.5	19125	24.29	24.5	0
				1857.5	18675	23.15	24	0-1
	QPSK		0	1880	18900	23.14	24	0-1
				1902.5	19125	23.28	24	0-1
			1857.5	18675	23.13	24	0-1	
		36 RB	18	1880	18900	23.13	24	0-1
				1902.5	19125	23.38	24	0-1
				1857.5	18675	23.13	24	0-1
			37	1880	18900	23.20	24	0-1
				1902.5	19125	23.46	24	0-1
				1857.5	18675	23.16	24	0-1
		75	RB	1880	18900	23.13	24	0-1
15			ı	1902.5	19125	23.34	24	0-1
				1857.5	18675	23.31	24	0-1
			0	1880	18900	23.35	24	0-1
				1902.5	19125	23.33	24	0-1
				1857.5	18675	23.30	24	0-1
		1 RB	36	1880	18900	23.48	24	0-1
				1902.5	19125	23.50	24	0-1
				1857.5	18675	23.35	24	0-1
			74	1880	18900	23.30	24	0-1
				1902.5	19125	23.56	24	0-1
	1/ 0 4 5 4			1857.5	18675	22.20	23	0-2
	16-QAM		0	1880	18900	22.19	23	0-2
				1902.5	19125	22.37	23	0-2
		27 DD	10	1857.5	18675	22.18	23	0-2
		36 RB	18	1880	18900	22.20	23	0-2
				1902.5	19125	22.43	23	0-2
			27	1857.5	18675	22.20	23	0-2
			37	1880	18900	22.23	23	0-2
				1902.5	19125	22.48	23	0-2
		7.	DD	1857.5	18675	22.26	23	0-2
		/5	RB	1880	18900	22.21	23	0-2
	731		1902.5	19125	22.40	23	0-2	

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Page: 22 of 319

			·	DD Band 2	2			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1855	18650	24.12	24.5	0
			0	1880	18900	24.03	24.5	0
				1905	19150	24.15	24.5	0
				1855	18650	24.12	24.5	0
		1 RB	25	1880	18900	24.07	24.5	0
				1905	19150	24.22	24.5	0
				1855	18650	24.05	24.5	0
			49	1880	18900	24.12	24.5	0
				1905	19150	24.34	24.5	0
	ODCK			1855	18650	23.12	24	0-1
	QPSK		0	1880	18900	23.14	24	0-1
				1905	19150	23.31	24	0-1
				1855	18650	23.09	24	0-1
		25 RB	12	1880	18900	23.09	24	0-1
				1905	19150	23.34	24	0-1
				1855	18650	23.11	24	0-1
			25	1880	18900	23.12	24	0-1
				1905	19150	23.34	24	0-1
				1855	18650	23.15	24	0-1
		50	RB	1880	18900	23.16	24	0-1
10				1905	19150	23.33	24	0-1
10			0	1855	18650	23.01	24	0-1
				1880	18900	23.00	24	0-1
				1905	19150	23.14	24	0-1
				1855	18650	22.98	24	0-1
		1 RB	25	1880	18900	23.01	24	0-1
				1905	19150	23.22	24	0-1
				1855	18650	23.01	24	0-1
			49	1880	18900	23.04	24	0-1
				1905	19150	23.08	24	0-1
	44 0444			1855	18650	22.19	23	0-2
	16-QAM		0	1880	18900	22.13	23	0-2
				1905	19150	22.37	23	0-2
		0F DD	10	1855	18650	22.14	23	0-2
		25 RB	12	1880	18900	22.15	23	0-2
				1905	19150	22.39	23	0-2
			25	1855	18650	22.18	23	0-2
			25	1880	18900	22.17	23	0-2
				1905	19150	22.38	23	0-2
			DD	1855	18650	22.19	23	0-2
		50	RB	1880	18900	22.19	23	0-2
				1905	19150	22.43	23	0-2

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Page: 23 of 319

			F	DD Band 2	)			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1852.5	18625	23.99	24.5	0
			0	1880	18900	24.05	24.5	0
				1907.5	19175	24.13	24.5	0
				1852.5	18625	23.99	24.5	0
		1 RB	12	1880	18900	24.13	24.5	0
				1907.5	19175	24.27	24.5	0
				1852.5	18625	23.96	24.5	0
			24	1880	18900	24.00	24.5	0
	ļ			1907.5	19175	24.27	24.5	0
				1852.5	18625	23.14	24	0-1
	QPSK		0	1880	18900	23.12	24	0-1
				1907.5	19175	23.32	24	0-1
		12.00		1852.5	18625	23.10	24	0-1
		12 RB	6	1880	18900	23.12	24	0-1
				1907.5	19175	23.32	24	0-1
				1852.5	18625	23.12	24	0-1
			13	1880	18900	23.14	24	0-1
				1907.5	19175	23.30	24	0-1
				1852.5	18625	23.13	24	0-1
		25	RB	1880	18900	23.09	24	0-1
5				1907.5	19175	23.35	24	0-1
				1852.5	18625	23.48	24	0-1
			0	1880	18900	23.28	24	0-1
				1907.5	19175	23.68	24	0-1
		4.00	40	1852.5	18625	23.45	24	0-1
		1 RB	12	1880	18900	23.61	24	0-1
				1907.5	19175	23.49	24	0-1
			24	1852.5	18625	23.25	24	0-1
			24	1880	18900	23.34	24	0-1
	ŀ			1907.5	19175	23.50	24	0-1
	16-QAM		0	1852.5	18625	22.18	23	0-2
	TO-QAIVI		U	1880	18900	22.21	23	0-2
				1907.5 1852.5	19175 18625	22.36 22.22	23 23	0-2 0-2
		12 RB	6	1880	18900	22.22	23	0-2
	1	IZ ND	U	1907.5	19175	22.12	23	0-2
				1907.5	18625	22.35	23	0-2
			13	1880	18900	22.11	23	0-2
			13	1907.5	19175	22.10	23	0-2
				1907.5	18625	22.27	23	0-2
		25	RR	1880	18900	22.10	23	0-2
	25R		1907.5	19175	22.35	23	0-2	

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Page: 24 of 319

FDD Band 2											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)			
				1851.5	18615	24.01	24.5	0			
			0	1880	18900	23.99	24.5	0			
				1908.5	19185	24.22	24.5	0			
				1851.5	18615	24.05	24.5	0			
		1 RB	7	1880	18900	24.11	24.5	0			
				1908.5	19185	24.25	24.5	0			
				1851.5	18615	24.02	24.5	0			
			14	1880	18900	24.05	24.5	0			
				1908.5	19185	24.18	24.5	0			
				1851.5	18615	23.07	24	0-1			
	QPSK		0	1880	18900	23.09	24	0-1			
				1908.5	19185	23.32	24	0-1			
				1851.5	18615	23.05	24	0-1			
		8 RB	4	1880	18900	23.10	24	0-1			
				1908.5	19185	23.34	24	0-1			
				1851.5	18615	23.04	24	0-1			
			7	1880	18900	23.14	24	0-1			
				1908.5	19185	23.31	24	0-1			
				1851.5	18615	23.03	24	0-1			
		15	RB	1880	18900	23.15	24	0-1			
3			ı	1908.5	19185	23.35	24	0-1			
			0	1851.5	18615	23.46	24	0-1			
				1880	18900	23.11	24	0-1			
				1908.5	19185	23.61	24	0-1			
		1 DD	_	1851.5	18615	23.36	24	0-1			
		1 RB	7	1880	18900	23.48	24	0-1			
				1908.5	19185	23.39	24	0-1			
			14	1851.5	18615	23.29	24	0-1			
			14	1880	18900	23.37	24 24	0-1 0-1			
				1908.5 1851.5	19185 18615	23.42 22.16	23	0-1			
	16-QAM		0	1880	18900	22.10	23	0-2			
	10-QAIVI			1908.5	19185	22.40	23	0-2			
				1851.5	18615	22.40	23	0-2			
		8 RB	4	1880	18900	22.13	23	0-2			
		ט אט	<b>_</b>	1908.5	19185	22.23	23	0-2			
				1851.5	18615	22.37	23	0-2			
			7	1880	18900	22.17	23	0-2			
			·	1908.5	19185	22.38	23	0-2			
			1	1851.5	18615	22.01	23	0-2			
		15	RB	1880	18900	22.15	23	0-2			
		15R		1908.5	19185	22.39	23	0-2			

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Page: 25 of 319

			F	DD Band 2	2			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1850.7	18607	23.97	24.5	0
			0	1880	18900	23.94	24.5	0
				1909.3	19193	24.23	24.5	0
				1850.7	18607	24.05	24.5	0
		1 RB	2	1880	18900	24.10	24.5	0
				1909.3	19193	24.25	24.5	0
				1850.7	18607	23.94	24.5	0
			5	1880	18900	23.96	24.5	0
				1909.3	19193	24.19	24.5	0
				1850.7	18607	23.11	24	0-1
	QPSK		0	1880	18900	23.12	24	0-1
				1909.3	19193	23.31	24	0-1
				1850.7	18607	23.05	24	0-1
		3 RB	2	1880	18900	23.05	24	0-1
				1909.3	19193	23.28	24	0-1
				1850.7	18607	23.12	24	0-1
			3	1880	18900	23.12	24	0-1
				1909.3	19193	23.31	24	0-1
				1850.7	18607	23.10	24	0-1
		61	RB	1880	18900	23.16	24	0-1
1.4				1909.3	19193	23.27	24	0-1
				1850.7	18607	23.00	24	0-1
			0	1880	18900	23.03	24	0-1
				1909.3	19193	23.22	24	0-1
				1850.7	18607	23.11	24	0-1
		1 RB	2	1880	18900	23.27	24	0-1
				1909.3	19193	23.53	24	0-1
				1850.7	18607	23.04	24	0-1
			5	1880	18900	23.02	24	0-1
				1909.3	19193	23.13	24	0-1
				1850.7	18607	22.05	23	0-2
	16-QAM		0	1880	18900	22.14	23	0-2
				1909.3	19193	22.23	23	0-2
			_	1850.7	18607	22.09	23	0-2
		3 RB	2	1880	18900	22.15	23	0-2
				1909.3	19193	22.20	23	0-2
				1850.7	18607	22.04	23	0-2
			3	1880	18900	22.17	23	0-2
				1909.3	19193	22.16	23	0-2
			2.0	1850.7	18607	22.13	23	0-2
		61	RB	1880	18900	22.28	23	0-2
	Oi		1909.3	19193	22.47	23	0-2	

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SGS Taiwan Ltd.



Page: 26 of 319

			F	DD Band 4	1			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1720	20050	24.49	24.5	0
			0	1732.5	20175	24.47	24.5	0
				1745	20300	24.48	24.5	0
				1720	20050	24.36	24.5	0
		1 RB	50	1732.5	20175	24.43	24.5	0
				1745	20300	24.37	24.5	0
				1720	20050	24.35	24.5	0
			99	1732.5	20175	24.46	24.5	0
				1745	20300	24.29	24.5	0
				1720	20050	23.65	24	0-1
	QPSK		0	1732.5	20175	23.53	24	0-1
				1745	20300	23.55	24	0-1
				1720	20050	23.59	24	0-1
		50 RB	25	1732.5	20175	23.54	24	0-1
				1745	20300	23.48	24	0-1
				1720	20050	23.56	24	0-1
			50	1732.5	20175	23.50	24	0-1
				1745	20300	23.48	24	0-1
				1720	20050	23.58	24	0-1
		100	ORB	1732.5	20175	23.51	24	0-1
20			ı	1745	20300	23.50	24	0-1
			0	1720	20050	23.82	24	0-1
			0	1732.5	20175	23.96	24	0-1
				1745	20300	23.38	24	0-1
		1 RB	50	1720 1732.5	20050 20175	23.76 23.56	24 24	0-1 0-1
		I KD	30	1732.5	20175	23.60	24	0-1
				1745	20050	23.85	24	0-1
			99	1732.5	20030	23.59	24	0-1
			,,	1732.3	20173	23.64	24	0-1
				1740	20050	22.68	23	0-2
	16-QAM		0	1732.5	20175	22.57	23	0-2
				1745	20300	22.63	23	0-2
				1740	20050	22.53	23	0-2
		50 RB	25	1732.5	20175	22.57	23	0-2
				1745	20300	22.41	23	0-2
				1720	20050	22.50	23	0-2
			50	1732.5	20175	22.46	23	0-2
				1745	20300	22.48	23	0-2
			•	1720	20050	22.59	23	0-2
		100	ORB	1732.5	20175	22.48	23	0-2
				1745	20300	22.39	23	0-2

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www.tw.sgs.com



Page: 27 of 319

	FDD Band 4											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				1717.5	20025	24.47	24.5	0				
			0	1732.5	20175	24.38	24.5	0				
				1747.5	20325	24.46	24.5	0				
				1717.5	20025	24.41	24.5	0				
		1 RB	36	1732.5	20175	24.39	24.5	0				
				1747.5	20325	24.39	24.5	0				
				1717.5	20025	24.37	24.5	0				
			74	1732.5	20175	24.41	24.5	0				
				1747.5	20325	24.30	24.5	0				
				1717.5	20025	23.56	24	0-1				
	QPSK		0	1732.5	20175	23.52	24	0-1				
				1747.5	20325	23.49	24	0-1				
				1717.5	20025	23.47	24	0-1				
		36 RB	18	1732.5	20175	23.49	24	0-1				
				1747.5	20325	23.46	24	0-1				
				1717.5	20025	23.45	24	0-1				
			37	1732.5	20175	23.50	24	0-1				
				1747.5	20325	23.44	24	0-1				
				1717.5	20025	23.49	24	0-1				
		75	RB	1732.5	20175	23.46	24	0-1				
15				1747.5	20325	23.38	24	0-1				
15				1717.5	20025	23.70	24	0-1				
			0	1732.5	20175	23.72	24	0-1				
				1747.5	20325	23.82	24	0-1				
				1717.5	20025	23.70	24	0-1				
		1 RB	36	1732.5	20175	23.76	24	0-1				
				1747.5	20325	23.69	24	0-1				
				1717.5	20025	23.67	24	0-1				
			74	1732.5	20175	23.82	24	0-1				
				1747.5	20325	23.80	24	0-1				
				1717.5	20025	22.56	23	0-2				
	16-QAM		0	1732.5	20175	22.51	23	0-2				
				1747.5	20325	22.53	23	0-2				
				1717.5	20025	22.50	23	0-2				
		36 RB	18	1732.5	20175	22.53	23	0-2				
				1747.5	20325	22.45	23	0-2				
				1717.5	20025	22.50	23	0-2				
			37	1732.5	20175	22.52	23	0-2				
				1747.5	20325	22.46	23	0-2				
				1717.5	20025	22.49	23	0-2				
		75	RB	1732.5	20175	22.50	23	0-2				
		7586		1747.5	20325	22.44	23	0-2				

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SGS Taiwan Ltd.



Page: 28 of 319

			F	FDD Band 4	1			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				1715	20000	24.41	24.5	0
			0	1732.5	20175	24.36	24.5	0
				1750	20350	24.39	24.5	0
				1715	20000	24.36	24.5	0
		1 RB	25	1732.5	20175	24.32	24.5	0
				1750	20350	24.36	24.5	0
				1715	20000	24.27	24.5	0
			49	1732.5	20175	24.37	24.5	0
				1750	20350	24.29	24.5	0
				1715	20000	23.53	24	0-1
	QPSK		0	1732.5	20175	23.46	24	0-1
				1750	20350	23.36	24	0-1
				1715	20000	23.53	24	0-1
		25 RB	12	1732.5	20175	23.41	24	0-1
				1750	20350	23.37	24	0-1
				1715	20000	23.48	24	0-1
			25	1732.5	20175	23.42	24	0-1
				1750	20350	23.35	24	0-1
			_	1715	20000	23.54	24	0-1
		50	RB	1732.5	20175	23.48	24	0-1
10				1750	20350	23.39	24	0-1
10			0	1715	20000	23.90	24	0-1
				1732.5	20175	23.84	24	0-1
				1750	20350	23.46	24	0-1
				1715	20000	23.80	24	0-1
		1 RB	25	1732.5	20175	23.68	24	0-1
				1750	20350	23.69	24	0-1
				1715	20000	23.71	24	0-1
			49	1732.5	20175	23.73	24	0-1
				1750	20350	23.71	24	0-1
				1715	20000	22.56	23	0-2
	16-QAM		0	1732.5	20175	22.51	23	0-2
				1750	20350	22.46	23	0-2
				1715	20000	22.50	23	0-2
		25 RB	12	1732.5	20175	22.44	23	0-2
				1750	20350	22.43	23	0-2
				1715	20000	22.46	23	0-2
			25	1732.5	20175	22.48	23	0-2
				1750	20350	22.37	23	0-2
				1715	20000	22.48	23	0-2
	50RI	RB	1732.5	20175	22.54	23	0-2	
	501		1750	20350	22.46	23	0-2	

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Page: 29 of 319

	FDD Band 4											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				1712.5	19975	24.28	24.5	0				
			0	1732.5	20175	24.41	24.5	0				
				1752.5	20375	24.40	24.5	0				
				1712.5	19975	24.29	24.5	0				
		1 RB	12	1732.5	20175	24.26	24.5	0				
				1752.5	20375	24.39	24.5	0				
				1712.5	19975	24.20	24.5	0				
			24	1732.5	20175	24.20	24.5	0				
				1752.5	20375	24.28	24.5	0				
				1712.5	19975	23.49	24	0-1				
	QPSK		0	1732.5	20175	23.45	24	0-1				
				1752.5	20375	23.43	24	0-1				
				1712.5	19975	23.48	24	0-1				
		12 RB	6	1732.5	20175	23.45	24	0-1				
				1752.5	20375	23.38	24	0-1				
				1712.5	19975	23.46	24	0-1				
			13	1732.5	20175	23.43	24	0-1				
				1752.5	20375	23.36	24	0-1				
			•	1712.5	19975	23.46	24	0-1				
		25	RB	1732.5	20175	23.41	24	0-1				
5				1752.5	20375	23.36	24	0-1				
5				1712.5	19975	23.64	24	0-1				
			0	1732.5	20175	23.68	24	0-1				
				1752.5	20375	23.70	24	0-1				
				1712.5	19975	23.57	24	0-1				
		1 RB	12	1732.5	20175	23.57	24	0-1				
				1752.5	20375	23.71	24	0-1				
				1712.5	19975	23.51	24	0-1				
			24	1732.5	20175	23.67	24	0-1				
				1752.5	20375	23.56	24	0-1				
				1712.5	19975	22.47	23	0-2				
	16-QAM		0	1732.5	20175	22.44	23	0-2				
				1752.5	20375	22.42	23	0-2				
				1712.5	19975	22.42	23	0-2				
		12 RB	6	1732.5	20175	22.40	23	0-2				
				1752.5	20375	22.40	23	0-2				
				1712.5	19975	22.44	23	0-2				
			13	1732.5	20175	22.42	23	0-2				
				1752.5	20375	22.37	23	0-2				
				1712.5	19975	22.45	23	0-2				
		25	RB	1732.5	20175	22.43	23	0-2				
1		25RE		1752.5	20375	22.32	23	0-2				

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Page: 30 of 319

	FDD Band 4											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				1711.5	19965	24.34	24.5	0				
			0	1732.5	20175	24.28	24.5	0				
				1753.5	20385	24.34	24.5	0				
				1711.5	19965	24.35	24.5	0				
		1 RB	7	1732.5	20175	24.31	24.5	0				
				1753.5	20385	24.33	24.5	0				
				1711.5	19965	24.29	24.5	0				
			14	1732.5	20175	24.25	24.5	0				
				1753.5	20385	24.25	24.5	0				
				1711.5	19965	23.48	24	0-1				
	QPSK		0	1732.5	20175	23.42	24	0-1				
				1753.5	20385	23.37	24	0-1				
		8 RB	4	1711.5	19965	23.45	24	0-1				
				1732.5	20175	23.41	24	0-1				
				1753.5	20385	23.34	24	0-1				
			7	1711.5	19965	23.44	24	0-1				
				1732.5	20175	23.45	24	0-1				
				1753.5	20385	23.35	24	0-1				
		15RB		1711.5	19965	23.45	24	0-1				
				1732.5	20175	23.50	24	0-1				
3				1753.5	20385	23.30	24	0-1				
J		1 RB 7	1711.5	19965	23.82	24	0-1					
			1732.5	20175	23.79	24	0-1					
				1753.5	20385	23.38	24	0-1				
			7	1711.5	19965	23.84	24	0-1				
				1732.5	20175	23.78	24	0-1				
				1753.5	20385	23.40	24	0-1				
				1711.5	19965	23.77	24	0-1				
			14	1732.5	20175	23.17	24	0-1				
				1753.5	20385	23.29	24	0-1				
			_	1711.5	19965	22.54	23	0-2				
	16-QAM		0	1732.5	20175	22.58	23	0-2				
				1753.5	20385	22.52	23	0-2				
		0.55		1711.5	19965	22.61	23	0-2				
		8 RB	4	1732.5	20175	22.59	23	0-2				
				1753.5	20385	22.51	23	0-2				
			_	1711.5	19965	22.60	23	0-2				
			7	1732.5	20175	22.56	23	0-2				
				1753.5	20385	22.49	23	0-2				
		1-	DD	1711.5	19965	22.49	23	0-2				
		15	RB	1732.5	20175	22.53	23	0-2				
				1753.5	20385	22.47	23	0-2				

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Page: 31 of 319

	FDD Band 4										
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)			
				1710.7	19957	24.29	24.5	0			
			0	1732.5	20175	24.27	24.5	0			
				1754.3	20393	24.31	24.5	0			
				1710.7	19957	24.34	24.5	0			
		1 RB	2	1732.5	20175	24.34	24.5	0			
				1754.3	20393	24.35	24.5	0			
				1710.7	19957	24.30	24.5	0			
			5	1732.5	20175	24.26	24.5	0			
				1754.3	20393	24.32	24.5	0			
				1710.7	19957	23.39	24	0-1			
	QPSK		0	1732.5	20175	23.40	24	0-1			
				1754.3	20393	23.38	24	0-1			
		3 RB	2	1710.7	19957	23.38	24	0-1			
				1732.5	20175	23.32	24	0-1			
				1754.3	20393	23.31	24	0-1			
			3	1710.7	19957	23.38	24	0-1			
				1732.5	20175	23.39	24	0-1			
				1754.3	20393	23.34	24	0-1			
		6RB		1710.7	19957	23.37	24	0-1			
				1732.5	20175	23.36	24	0-1			
1.4				1754.3	20393	23.36	24	0-1			
		1 RB 2	1710.7	19957	23.58	24	0-1				
			0	1732.5	20175	23.45	24	0-1			
				1754.3	20393	23.49	24	0-1			
			2	1710.7	19957	23.58	24	0-1			
				1732.5	20175	23.51	24	0-1			
				1754.3	20393	23.52	24	0-1			
				1710.7	19957	23.51	24	0-1			
			5	1732.5	20175	23.46	24	0-1			
				1754.3	20393	23.45	24	0-1			
	4/ 044			1710.7	19957	22.43	23	0-2			
	16-QAM		0	1732.5	20175	22.38	23	0-2			
				1754.3	20393	22.34	23	0-2			
		0.00	_	1710.7	19957	22.41	23	0-2			
		3 RB	2	1732.5	20175	22.39	23	0-2			
				1754.3	20393	22.29	23	0-2			
			2	1710.7	19957	22.42	23	0-2			
			3	1732.5	20175	22.39	23	0-2			
				1754.3	20393	22.27	23	0-2			
		/,	מכ	1710.7	19957	22.48	23	0-2			
		61	RB	1732.5	20175	22.43	23	0-2			
				1754.3	20393	22.47	23	0-2			

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SGS Taiwan Ltd.



Page: 32 of 319

			ı	DD Band !	<u> </u>			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				829	20450	24.34	24.5	0
			0	836.5	20525	24.24	24.5	0
				844	20600	24.32	24.5	0
				829	20450	24.23	24.5	0
		1 RB	25	836.5	20525	24.33	24.5	0
				844	20600	24.37	24.5	0
				829	20450	24.24	24.5	0
			49	836.5	20525	24.38	24.5	0
				844	20600	24.18	24.5	0
				829	20450	23.32	24	0-1
	QPSK		0	836.5	20525	23.33	24	0-1
				844	20600	23.34	24	0-1
		25 RB	12	829	20450	23.35	24	0-1
				836.5	20525	23.37	24	0-1
				844	20600	23.34	24	0-1
			25	829	20450	23.36	24	0-1
				836.5	20525	23.35	24	0-1
				844	20600	23.38	24	0-1
		50RB		829	20450	23.37	24	0-1
				836.5	20525	23.40	24	0-1
10				844	20600	23.35	24	0-1
				829	20450	23.41	24	0-1
		1 RB 25	0	836.5	20525	23.82	24	0-1
				844	20600	23.64	24	0-1
			25	829	20450	23.53	24	0-1
				836.5	20525	23.49	24	0-1
			<u> </u>	844	20600	23.99	24	0-1
			40	829	20450	23.48	24	0-1
			49	836.5	20525 20600	23.68 23.83	24 24	0-1 0-1
				844				1
	16-QAM		0	829 836 5	20450	22.31	23	0-2 0-2
	10-QAIVI			836.5 844	20525 20600	22.40	23 23	0-2
				829	20450	22.39 22.32	23	0-2
		25 RB	12	836.5	20450	22.32	23	0-2
		20 10	'-	844	20600	22.47	23	0-2
				829	20450	22.31	23	0-2
			25	836.5	20525	22.48	23	0-2
				844	20600	22.40	23	0-2
				829	20450	22.43	23	0-2
		50	RB	836.5	20525	22.46	23	0-2
				844	20600	22.37	23	0-2

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SGS Taiwan Ltd.



Page: 33 of 319

			F	DD Band 5	5			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				826.5	20425	24.32	24.5	0
			0	836.5	20525	24.16	24.5	0
				846.5	20625	24.24	24.5	0
				826.5	20425	24.27	24.5	0
		1 RB	12	836.5	20525	24.26	24.5	0
				846.5	20625	24.18	24.5	0
				826.5	20425	24.17	24.5	0
			24	836.5	20525	24.20	24.5	0
				846.5	20625	24.17	24.5	0
			_	826.5	20425	23.37	24	0-1
	QPSK		0	836.5	20525	23.34	24	0-1
				846.5	20625	23.40	24	0-1
		12 RB	6	826.5	20425	23.38	24	0-1
				836.5	20525	23.36	24	0-1
				846.5	20625	23.37	24	0-1
			13	826.5	20425	23.35	24	0-1
				836.5	20525	23.37	24	0-1
				846.5	20625	23.38	24	0-1
		25RB		826.5	20425	23.32	24	0-1
				836.5	20525	23.30	24	0-1
5			ı	846.5	20625	23.35	24	0-1
				826.5	20425	23.53	24	0-1
		1 RB 12	U	836.5	20525	23.43	24	0-1
				846.5	20625	23.87	24	0-1
			12	826.5	20425	23.51	24	0-1
				836.5 846.5	20525 20625	23.50 23.78	24 24	0-1 0-1
				826.5	20025	23.76	24	0-1
			24	836.5	20525	23.44	24	0-1
			2.7	846.5	20625	23.70	24	0-1
				826.5	20425	22.42	23	0-1
	16-QAM		0	836.5	20525	22.42	23	0-2
	10 27111		Ŭ	846.5	20625	22.49	23	0-2
				826.5	20425	22.37	23	0-2
		12 RB	6	836.5	20525	22.38	23	0-2
				846.5	20625	22.47	23	0-2
				826.5	20425	22.47	23	0-2
			13	836.5	20525	22.47	23	0-2
				846.5	20625	22.46	23	0-2
			<u> </u>	826.5	20425	22.35	23	0-2
		25	RB	836.5	20525	22.34	23	0-2
				846.5	20625	22.37	23	0-2

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Page: 34 of 319

	FDD Band 5										
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)			
				825.5	20415	24.06	24.5	0			
			0	836.5	20525	24.04	24.5	0			
				847.5	20635	24.25	24.5	0			
				825.5	20415	24.05	24.5	0			
		1 RB	7	836.5	20525	24.10	24.5	0			
				847.5	20635	24.31	24.5	0			
				825.5	20415	24.07	24.5	0			
			14	836.5	20525	24.05	24.5	0			
				847.5	20635	24.26	24.5	0			
				825.5	20415	23.26	24	0-1			
	QPSK		0	836.5	20525	23.28	24	0-1			
				847.5	20635	23.38	24	0-1			
			4	825.5	20415	23.27	24	0-1			
		8 RB		836.5	20525	23.26	24	0-1			
				847.5	20635	23.36	24	0-1			
			7	825.5	20415	23.30	24	0-1			
				836.5	20525	23.31	24	0-1			
				847.5	20635	23.38	24	0-1			
		15RB		825.5	20415	23.36	24	0-1			
				836.5	20525	23.25	24	0-1			
3				847.5	20635	23.30	24	0-1			
		0 1 RB 7	825.5	20415	23.51	24	0-1				
			0	836.5	20525	23.56	24	0-1			
				847.5	20635	23.65	24	0-1			
			7	825.5	20415	23.52	24	0-1			
				836.5	20525	23.65	24	0-1			
				847.5	20635	23.69	24	0-1			
			1.4	825.5	20415	23.49	24	0-1			
			14	836.5	20525	23.57	24	0-1			
				847.5	20635	23.57	24	0-1			
	16 0 11 11		0	825.5	20415	22.28	23	0-2			
	16-QAM		0	836.5	20525	22.40	23	0-2			
				847.5	20635	22.47	23	0-2			
		8 RB	4	825.5	20415	22.36	23	0-2			
		OKD	4	836.5	20525	22.39	23	0-2			
				847.5	20635	22.47	23	0-2			
			7	825.5 836.5	20415	22.36	23	0-2 0-2			
			7	847.5	20525	22.45 22.49	23	0-2			
					20635 20415	22.49	23 23	0-2			
		15	RB	825.5 836.5	20525	22.38	23	0-2			
		13	עאו				23	0-2			
				847.5	20635	22.30	23	U-Z			

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Page: 35 of 319

			F	DD Band 5	5			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				824.7	20407	24.19	24.5	0
			0	836.5	20525	24.14	24.5	0
				848.3	20643	24.19	24.5	0
				824.7	20407	24.25	24.5	0
		1 RB	2	836.5	20525	24.29	24.5	0
				848.3	20643	24.33	24.5	0
				824.7	20407	24.15	24.5	0
			5	836.5	20525	24.16	24.5	0
				848.3	20643	24.20	24.5	0
				824.7	20407	23.28	24	0-1
	QPSK		0	836.5	20525	23.26	24	0-1
				848.3	20643	23.29	24	0-1
		3 RB	2	824.7	20407	23.25	24	0-1
				836.5	20525	23.17	24	0-1
				848.3	20643	23.27	24	0-1
			3	824.7	20407	23.25	24	0-1
				836.5	20525	23.20	24	0-1
				848.3	20643	23.28	24	0-1
		6RB		824.7	20407	23.28	24	0-1
				836.5	20525	23.24	24	0-1
1.4				848.3	20643	23.29	24	0-1
		1 RB 2		824.7	20407	23.50	24	0-1
			0	836.5	20525	23.38	24	0-1
				848.3	20643	23.42	24	0-1
			2	824.7	20407	23.48	24	0-1
				836.5	20525	23.49	24	0-1
				848.3	20643	23.59	24	0-1
			_	824.7	20407	23.39	24	0-1
			5	836.5	20525	23.43	24	0-1
				848.3	20643	23.48	24	0-1
	4/ 044			824.7	20407	22.34	23	0-2
	16-QAM		0	836.5	20525	22.33	23	0-2
				848.3	20643	22.38	23	0-2
		0.55		824.7	20407	22.33	23	0-2
		3 RB	2	836.5	20525	22.32	23	0-2
				848.3	20643	22.33	23	0-2
			_	824.7	20407	22.30	23	0-2
			3	836.5	20525	22.32	23	0-2
				848.3	20643	22.37	23	0-2
			D.D.	824.7	20407	22.33	23	0-2
		6l	RB	836.5	20525	22.39	23	0-2
				848.3	20643	22.42	23	0-2

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Page: 36 of 319

FDD Band 7										
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)		
				2510	20850	22.02	22.3	0		
			0	2535	21100	22.08	22.3	0		
				2560	21350	22.17	22.3	0		
				2510	20850	21.92	22.3	0		
		1 RB	50	2535	21100	21.98	22.3	0		
				2560	21350	22.14	22.3	0		
				2510	20850	22.17	22.3	0		
			99	2535	21100	22.24	22.3	0		
				2560	21350	22.27	22.3	0		
				2510	20850	21.00	22	0-1		
	QPSK		0	2535	21100	21.06	22	0-1		
				2560	21350	21.22	22	0-1		
				2510	20850	21.04	22	0-1		
		50 RB	25	2535	21100	21.08	22	0-1		
				2560	21350	21.20	22	0-1		
			50	2510	20850	21.11	22	0-1		
				2535	21100	21.22	22	0-1		
				2560	21350	21.34	22	0-1		
		100RB		2510	20850	21.04	22	0-1		
				2535	21100	21.18	22	0-1		
20				2560	21350	21.29	22	0-1		
20		0 1 RB 50		2510	20850	21.03	22	0-1		
			2535	21100	21.48	22	0-1			
			2560	21350	21.30	22	0-1			
			50	2510	20850	21.25	22	0-1		
				2535	21100	21.59	22	0-1		
				2560	21350	21.03	22	0-1		
				2510	20850	21.29	22	0-1		
			99	2535	21100	21.73	22	0-1		
				2560	21350	21.48	22	0-1		
				2510	20850	20.04	21	0-2		
	16-QAM		0	2535	21100	20.04	21	0-2		
				2560	21350	20.14	21	0-2		
				2510	20850	20.03	21	0-2		
		50 RB	25	2535	21100	20.11	21	0-2		
				2560	21350	20.16	21	0-2		
				2510	20850	20.10	21	0-2		
			50	2535	21100	20.26	21	0-2		
				2560	21350	20.21	21	0-2		
				2510	20850	20.00	21	0-2		
		100	ORB	2535	21100	20.13	21	0-2		
				2560	21350	20.15	21	0-2		

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Page: 37 of 319

FDD Band 7												
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				2507.5	20825	22.01	22.3	0				
			0	2535	21100	22.08	22.3	0				
				2562.5	21375	22.15	22.3	0				
				2507.5	20825	22.09	22.3	0				
		1 RB	36	2535	21100	22.13	22.3	0				
				2562.5	21375	22.22	22.3	0				
				2507.5	20825	22.13	22.3	0				
			74	2535	21100	22.26	22.3	0				
				2562.5	21375	22.27	22.3	0				
				2507.5	20825	21.06	22	0-1				
	QPSK		0	2535	21100	21.19	22	0-1				
		27.00		2562.5	21375	21.31	22	0-1				
				2507.5	20825	21.08	22	0-1				
		36 RB	18	2535	21100	21.21	22	0-1				
				2562.5	21375	21.30	22	0-1				
				2507.5	20825	21.19	22	0-1				
			37	2535	21100	21.30	22	0-1				
				2562.5	21375	21.37	22	0-1				
				2507.5	20825	21.14	22	0-1				
		75	RB	2535	21100	21.21	22	0-1				
15				2562.5	21375	21.35	22	0-1				
				2507.5	20825	21.57	22	0-1				
			0	2535	21100	21.04	22	0-1				
				2562.5	21375	21.07	22	0-1				
				2507.5	20825	21.62	22	0-1				
		1 RB	36	2535	21100	21.35	22	0-1				
				2562.5	21375	21.13	22	0-1				
			٦.	2507.5	20825	21.29	22	0-1				
			74	2535	21100	21.22	22	0-1				
				2562.5	21375	21.41	22	0-1				
	16 0 4 14		0	2507.5	20825	20.10	21	0-2				
	16-QAM		0	2535	21100	20.14	21	0-2				
				2562.5	21375	20.20	21	0-2				
		24 DD	10	2507.5	20825	20.11	21	0-2				
		36 RB	18	2535 2542 5	21100	20.19	21	0-2				
				2562.5	21375	20.25 20.15	21	0-2				
			37	2507.5 2535	20825 21100	20.15	21 21	0-2 0-2				
			31	2562.5	21100	20.27	21	0-2				
			<u> </u>	2507.5	20825	20.29	21	0-2				
		75	RB	2507.5	21100	20.03	21	0-2				
		/3		2562.5	21375	20.14	21	0-2				

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SGS Taiwan Ltd.



Page: 38 of 319

	FDD Band 7											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				2505	20800	22.10	22.3	0				
			0	2535	21100	22.10	22.3	0				
				2565	21400	22.23	22.3	0				
				2505	20800	22.08	22.3	0				
		1 RB	25	2535	21100	22.14	22.3	0				
				2565	21400	22.21	22.3	0				
				2505	20800	22.11	22.3	0				
			49	2535	21100	22.20	22.3	0				
				2565	21400	22.24	22.3	0				
				2505	20800	21.16	22	0-1				
	QPSK		0	2535	21100	21.19	22	0-1				
		05.00		2565	21400	21.32	22	0-1				
				2505	20800	21.16	22	+				
		25 RB	12	2535	21100	21.21						
				2565	21400	21.34		1				
				2505	20800	21.12	22 22 3 3 4 22 4 22					
			25	2535	21100	21.25		22 0-1 22 0-1 22 0-1 22 0-1 22 0-1 22 0-1 22 0-1				
				2565	21400	21.36		+				
				2505	20800	21.14	1.34     22     0-1       1.12     22     0-1       1.25     22     0-1       1.36     22     0-1       1.14     22     0-1       1.25     22     0-1       1.39     22     0-1       1.16     22     0-1					
		50	RB	2535	21100	21.25						
10			ı	2565	21400	21.39						
		_	_	2505	20800	21.16						
			0	2535	21100	21.28	22					
		50		2565	21400	21.35	22					
		4.55		2505	20800	21.21	22					
		1 RB	25	2535	21100	21.34	22	•				
				2565	21400	21.37	22					
			40	2505	20800	21.14	22	•				
			49	2535	21100	21.44	22					
				2565	21400	21.47	22					
	14 0 11 11		0	2505	20800	20.09	21					
	16-QAM		0	2535	21100	20.09	21	+				
				2565	21400	20.16	21					
		JE DD	10	2505	20800	20.13	21	1				
		25 RB	12	2535	21100	20.12	21					
				2565	21400	20.22	21					
			25	2505	20800	20.04	21	0-1 0-1 0-1 0-1 0-1 0-1				
			25	2535	21100	20.14	21					
				2565 2505	21400	20.25	21					
		EO	RB	2505 2535	20800	20.11	21					
		50	טאיי	2535 2565	21100	20.17	21					
				2565	21400	20.29	21	0-2				

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Page: 39 of 319

			F	DD Band 7	7			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				2502.5	20775	22.06	22.3	0
			0	2535	21100	22.21	22.3	0
				2567.5	21425	22.33	22.3	0
				2502.5	20775	22.20	22.3	0
		1 RB	12	2535	21100	22.27	22.3	0
				2567.5	21425	22.20	Power + Max. Tolerance (dBm)  22.3 22.3 22.3 22.3 22.3 22.3 22.3 22	0
				2502.5	20775	22.05	22.3	0
			24	2535	21100	22.21	22.3	0
				2567.5	21425	22.30	22.3	0
				2502.5	20775	21.20	22	0-1
	QPSK		0	2535	21100	21.25	22	0-1
				2567.5	21425	21.36	22	0-1
				2502.5	20775	21.20	22	0-1
		12 RB	6	2535	21100	21.26	22	0-1
				2567.5		0-1		
				2502.5	20775	21.16	22	0-1
			13	2535	21100	21.22	22	0-1
				2567.5	21425	21.35	22	0-1
				2502.5	20775	21.15	22	0-1
		25	RB	2535	21100	21.22	22	0-1
5				2567.5	21425	21.33	22	0-1
J				2502.5	20775	21.63	22	0-1
			0	2535	21100	21.71		0-1
				2567.5	21425	21.73		0-1
				2502.5	20775	21.71		0-1
		1 RB	12	2535	21100	21.72		0-1
				2567.5	21425	21.79		0-1
				2502.5	20775	21.63		0-1
			24	2535	21100	21.74		0-1
				2567.5	21425	21.77		0-1
			_	2502.5	20775	20.17		0-2
	16-QAM		0	2535	21100	20.21		0-2
				2567.5	21425	20.27		0-2
		40		2502.5	20775	20.15		0-2
		12 RB 6	2535	21100	20.23		0-2	
				2567.5	21425	20.29		0-2
			40	2502.5	20775	20.16		0-2
			13	2535	21100	20.21		0-2
				2567.5	21425	20.31		0-2
		= =	<b>D</b> D	2502.5	20775	20.17	21	0-2
		25	RB	2535	21100	20.22	21	0-2
				2567.5	21425	20.32	21	0-2

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SGS Taiwan Ltd.



Page: 40 of 319

	FDD Band 12											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				703	23050	24.36	24.5	0				
			0	707	23090	24.39		0				
				711	23130	24.31	ructed ver	0				
				703	23050	24.43	24.5	0				
		1 RB	25	707	23090	24.48	24.5	0				
				711	23130	24.33	24.5	0				
				703	23050	24.42	24.5	0				
			49	707	23090	24.44	24.5	0				
				711	23130	24.23	24.5	0				
				703	23050	23.38	24	0-1				
	QPSK		0	707	23090	23.51	24	0-1				
				711	23130	23.44	24	0-1				
				703	23050	23.41	24	0-1				
		25 RB	12	707	23090	23.48	24	0-1				
				711	23130	23.43	24	0-1				
				703	23050	23.49	24	0-1				
			25	707	23090	23.48	24	0-1				
				711	23130	23.55	24	0-1				
				703	23050	23.34	24	0-1				
		50	RB	707	23090	23.42	24	0-1				
10				711	23130	23.47	24	0-1				
10				703	23050	23.97	24	0-1				
			0	707	23090	23.99	24	0-1				
				711	23130	23.64	24	0-1				
				703	23050	24.91	24	0-1				
		1 RB	25	707	23090	23.76	24	0-1				
				711	23130	23.68	24	0-1				
				703	23050	23.94	24	0-1				
			49	707	23090	23.68	24	0-1				
				711	23130	23.56	24	0-1				
				703	23050	22.49	23	0-2				
	16-QAM		0	707	23090	22.63	23	0-2				
				711	23130	22.57	23	0-2				
				703	23050	22.48	23	0-2				
		25 RB	12	707	23090	22.64		0-2				
				711	23130	22.59		0-2				
				703	23050	22.53		0-2				
			25	707	23090	22.64		0-2				
				711	23130	22.57	23	0-2				
				703	23050	22.50		0-2				
		50	RB	707	23090	22.59		0-2				
				711	23130	22.57	23	0-2				

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SGS Taiwan Ltd.



Page: 41 of 319

			F	DD Band 1	2			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				700.5	23025	24.27	24.5	0
			0	707	23090	24.32	24.5	0
				713.5	23155	24.24	24.5	0
				700.5	23025	24.36	24.5	0
		1 RB	12	707	23090	24.41	24.5	0
				713.5	23155	24.30	24.5	0
				700.5	23025	24.32	24.5	0
			24	707	23090	24.37	24.5	0
				713.5	23155	24.13	24.5	0
				700.5	23025	23.39	24	0-1
	QPSK		0	707	23090	23.47	24	0-1
				713.5	23155	23.43	24	0-1
				700.5	23025	23.39	24	0-1
		12 RB	6	707	23090	23.48	24	
				713.5	23155	23.44	24	1
				700.5	23025	23.46	24	
			13	707	23090	23.45	24	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
				713.5	23155	23.42	24	
				700.5	23025	23.31	24	•
		25	RB	707	23090	23.38	24	
5			1	713.5	23155			
			0	700.5	23025			
				707	23090			<del> </del>
				713.5	23155			<b>i</b>
		1 DD	10	700.5	23025			
		1 RB	12	707	23090			
				713.5	23155			<del> </del>
			24	700.5	23025	23.38     24     0-       23.94     24     0-       23.89     24     0-       23.54     24     0-       23.98     24     0-       23.66     24     0-       23.58     24     0-       23.58     24     0-       23.58     24     0-       23.46     24     0-	ł	
			24					
	16-QAM		n				23 23	0-2 0-2
	10-QAIVI		J				23	0-2
							23	0-2
		12 RB	6				23	0-2
		12 110			23	0-2		
				713.5	23025	22.43	23	0-2
			13	707	23090	22.54	23	0-2
				713.5	23155	22.47	23	0-2
				710.5	23025	22.40	23	0-2
		25	RB	707	23090	22.49	23	0-2
				713.5	23155	22.47	23	0-2

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Page: 42 of 319

			F	DD Band 1	2			
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
				699.5	23015	24.17	24.5	0
			0	707	23090	24.30	24.5	0
				714.5	23165	24.26	24.5	0
				699.5	23015	24.20	24.5	0
		1 RB	7	707	23090	24.36	24.5	0
				714.5	23165	24.33	24.5	0
				699.5	23015	24.30	24.5	0
			14	707	23090	24.30	24.5	0
				714.5	23165	24.21	24.5	0
				699.5	23015	23.40	24	0-1
	QPSK		0	707	23090	23.45	24	0-1
				714.5	23165	23.41	24	0-1
				699.5	23015	23.38	24	0-1
		8 RB	4	707	23090	23.44	24	0-1
				714.5	23165	23.38	24	0-1
				699.5	23015	23.36	24	0-1
			7	707	23090	23.45	24	0-1
				714.5	23165	23.40	24	0-1
				699.5	23015	23.36	24	0-1
		15	RB	707	23090	23.39	24	0-1
3				714.5	23165	23.42	24	0-1
				699.5	23015	23.57	24	0-1
			0	707	23090	23.38	24	0-1
				714.5	23165	23.38	24	0-1
				699.5	23015	23.65	24	0-1
		1 RB	7	707	23090	23.86	24	0-1
				714.5	23165	23.44	24	0-1
				699.5	23015	23.49	24	0-1
			14	707	23090	23.52	24	0-1
				714.5	23165	23.36	24	0-1
	44 0 1 1 4			699.5	23015	22.35	23	0-2
	16-QAM		0	707	23090	22.55	23	0-2
				714.5	23165	22.45	23	0-2
		0.00		699.5	23015	22.44	23	0-2
		8 RB	4	707	23090	22.57	23	0-2
				714.5	23165	22.57	23	0-2
			7	699.5	23015	22.57	23	0-2
			7	707	23090	22.63	23	0-2
				714.5	23165	22.45	23	0-2
		15	DΩ	699.5	23015	22.39	23	0-2
		15	RB	707 714.5	23090	22.37	23	0-2
					23165	22.38	23	0-2

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Page: 43 of 319

	FDD Band 12											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
				698.7	23007	24.13	24.5	0				
			0	707	23090	24.28	24.5	0				
				715.3	23173	24.24	24.5	0				
				698.7	23007	24.12	24.5	er + MPR Allowed per 3GPP(dB)  1.5				
		1 RB	2	707	23090	24.31	24.5	0				
				715.3	23173	24.35	24.5	0				
				698.7	23007	24.29	24.5	0				
			5	707	23090	24.21	24.5	0				
				715.3	23173	24.18	24.5	0				
	QPSK			698.7	23007	23.41	24					
			0	707	23090	23173 23.37 24 (	0-1					
				715.3	23173							
				698.7	23007	23.37						
		3 RB	2	707	23090	23.41						
				715.3	23173	23.39	24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1 24 0-1	1				
				698.7	23007	23.41						
			3	707	23090	23.44		1				
				715.3	23173	23.44		<b>.</b>				
				698.7 23007 23.31 707 23090 23.36				•				
		61	RB									
1.4			1	715.3	23173	23.36						
				698.7	23007	23.51	24					
			0	707	23090	23.31	24					
				715.3	23173	23.44	24					
				698.7	23007	23.68	24					
		1 RB	2	707	23090	23.81	24					
				715.3	23173	23.51	24					
			_	698.7	23007	23.51	24					
			5	707	23090	23.57	24					
				715.3	23173	23.31	24					
	16 0 11 11		0	698.7	23007	22.44	23					
	16-QAM		0	707	23090	22.61	23	1				
				715.3	23173	22.52	23					
		2 00	2	698.7	23007	22.46	23	1				
		3 RB	2	707	23090	22.52	23					
				715.3	23173	22.57	23	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
			2	698.7	23007	22.51	23					
			3	707	23090	22.71	23					
				715.3 698.7	23173	22.41	23					
		<b>ل</b> ا	RB	707	23007	22.36	23	1				
	61		(D		23090	22.38						
				715.3	23173	22.41	23	0-2				

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Page: 44 of 319

	FDD Band 13										
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)			
			0	782	23230	24.31	24.5	0			
		1 RB	25	782	23230	24.44	24.5	0			
			49	782	23230	24.29	24.5 24.5 24 24	0			
	QPSK		0	782	23230	23.41	24	0-1			
		25 RB	12	782	23230	23.43	24	0-1			
			25	782	23230	23.39					
10		50	RB	782	23230	23.48	24	0-1			
10			0	782	23230	23.94	24	0-1			
		1 RB	25	782	23230	23.89	24	0-1			
			49	782	23230	23.88	24	0-1			
	16-QAM		0	782	23230	22.46	23	0-2			
		25 RB	12	782	23230	22.49	23	0-2			
			25	782	23230	22.48	23	0-2			
		50	RB	782	23230	22.54	23	0-2			

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Page: 45 of 319

	FDD Band 13											
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)				
			0	779.5 782	23205 23230	24.28 24.30	24.5 24.5	0				
				784.5	23255	24.30	24.5	Power + MPR Allowed per SGPP(dB)  24.5 0  24.5 0				
				779.5	23205	24.31	24.5	0				
		1 RB	12	782	23230	24.26	24.5	0				
				784.5	23255	24.29	24.5	0				
				779.5	23205	24.18	24.5	0				
			24	782	23230	24.20	24.5	0				
				784.5	23255	24.15	24.5	0				
				779.5	23205	23.49	24	0-1				
	QPSK		0	782	23230	23.45	24	0-1				
				784.5	23255	23.46	24	0-1				
				779.5	23205	23.47	24	0-1				
		12 RB	6	782		0-1						
				784.5	23255	23.48	24	0-1				
				779.5	23205	23.44	24	0-1				
			13	782	23230	23.45	24	0-1				
				784.5	23255	23.42	24	0-1				
				779.5	23205	23.45	24	0-1				
_		25	RB	782	23230	23.42	24	0-1				
5				784.5	23255	23.43	24	0-1				
				779.5	23205	23.59	24	0-1				
			0	782	23230	23.57	24	0-1				
				784.5	23255	23.63	24	0-1				
				779.5	23205	23.60	24	0-1				
		1 RB	12	782	23230	23.54	24	0-1				
				784.5	23255	23.61	24	0-1				
				779.5	23205	23.47	24	0-1				
			24	782	23230	23.59		0-1				
				784.5	23255	23.51	24	0-1				
	16-QAM			779.5	23205	22.56	23	0-2				
			0	782	23230	22.54						
				784.5	23255	22.43						
		12 RB	6	779.5	23205	22.54		1				
		12 110	0	782 784.5	23230 23255	22.52 22.44						
				779.5	23205	22.55						
			13	782	23230	22.43	23					
				784.5	23255	22.42	23					
		25	DD	779.5	23205	22.53						
		25	RB	782 784.5	23230 23255	22.48 22.43						

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Page: 46 of 319

			F	DD Band 1	7		FDD Band 17												
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)											
				709	23780	24.43	24.5	0											
			0	710	23790	24.33	onducted power power (dBm)         Power + Max.         MPR Allow per 3GPP(dB)           24.43         24.5         0	0											
				711	23800	24.42	24.5	0											
				709	23780	Conducted power (dBm)         Power Hax. Tolerance (dBm)         MPR Allowed per 3GPP(dB)           24.43         24.5         0           24.33         24.5         0           24.42         24.5         0           24.44         24.5         0           24.40         24.5         0           24.44         24.5         0           24.49         24.5         0           24.46         24.5         0           24.46         24.5         0           23.57         24         0-1           23.54         24         0-1           23.55         24         0-1           23.56         24         0-1           23.56         24         0-1           23.57         24         0-1           23.56         24         0-1           23.56         24         0-1           23.57         24         0-1           23.56         24         0-1           23.57         24         0-1           23.59         24         0-1           23.59         24         0-1           23.50         24         0-1													
		1 RB	25	710	23790	24.40	Power + Max. Tolerance (dBm)  24.5												
				711	23800	24.44	24.5	0											
				709	23780	24.49	24.5	0											
			49	710	23790	24.46	24.5	0											
				711	23800	24.46	24.5	0											
	QPSK			709	23780	23.57		0-1											
			0	710	23790	23.54		0-1											
				711	23800			0-1											
				709	23780			0-1											
		25 RB	12	710	23790														
				711	23800	23.57		0-1											
				709	23780	23.61		0-1											
			25	710	23790	23.59	24	0-1											
				711	23800	23.56	24	0-1											
				709	23780	23.56 24 23.61 24 23.64 24		0-1											
		50	RB	710	23790														
10			•	711	23800														
				709	23780														
			0	710	23790			+											
				711	23800														
				709	23780														
		1 RB	25	710	23790														
				711	23800														
				709	23780														
			49	710	23790														
				711	23800														
	1/ 0454			709	23780														
	16-QAM		0	710	23790														
				711	23800														
		0F DD	10	709	23780														
		25 RB	12	710	23790														
				711	23800														
			25	709	23780														
			25	710	23790														
				711	23800														
			DD	709	23780														
		50	RB	710	23790														
				711	23800	22.53	23	0-2											

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Page: 47 of 319

BW(Mhz)   Modulation   RB Size   RB Offset   Frequency (MHz)   Channel (glbm)   Channel (glbm)   Target   MPR Allower per (glbm)   Tolerance (glbm)   Tolerance (glbm)   Tolerance (glbbm)   Tolerance (glbb		FDD Band 17										
OPSK  OPSK  1 RB  12  1 RB  12  710  23790  24.33  24.5  0  713.5  23825  24.43  24.5  0  710  23790  24.39  24.5  0  713.5  23825  24.43  24.5  0  713.5  23825  24.43  24.5  0  713.5  23825  24.43  24.5  0  713.5  23825  24.43  24.5  0  713.5  23825  24.43  24.5  0  713.5  23825  24.43  24.5  0  713.5  23825  24.43  24.5  0  710  23790  24.49  24.5  0  710  23790  24.46  24.5  0  710  23790  24.46  24.5  0  710  23790  23.49  24  0-1  713.5  23825  23.52  24  0-1  713.5  23825  23.52  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.94  24  0-1  713.5  23825  23.94  24  0-1  713.5  23825  23.94  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  713.5  7	BW(Mhz)	Modulation	RB Size		Frequency		power	Power + Max. Tolerance	per			
PSK  1 RB  1					706.5	23755	24.47	24.5	0			
1 RB				0	710	23790	24.33	24.5	0			
PART PART NAME NAME NAME NAME NAME NAME NAME NAME					713.5	23825	24.43	24.5	0			
OPSK					706.5	23755	24.43		0			
OPSK  QPSK			1 RB	12			24.39	24.5				
APPRIATE TO PART TO PA							24.43	24.5				
OPSK												
OPSK				24		23790	24.46	24.5				
PSK    12 RB												
12 RB   6   713.5   23825   23.52   24   0-1												
12 RB  6  706.5  710  23790  23.50  24  0-1  713.5  23825  23.51  24  0-1  706.5  23755  23.56  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.52  24  0-1  713.5  23825  23.52  24  0-1  713.5  23825  23.51  24  0-1  713.5  23825  23.52  24  0-1  713.5  23825  23.51  24  0-1  710  23790  23.52  24  0-1  713.5  23825  23.44  24  0-1  713.5  23825  23.44  24  0-1  713.5  23825  23.44  24  0-1  713.5  23825  23.94  24  0-1  713.5  23825  23.94  24  0-1  713.5  23825  23.93  24  0-1  713.5  23825  23.94  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.97  24  0-1  713.5  23825  23.90  20.2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.56  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2		QPSK		0								
12 RB   6									1			
188   12   710   23790   23.95   24   0-1   23790   23.95   23.51   24   0-1   23790   23.95   23.51   24   0-1   23790   23.49   24   0-1   23790   23.49   24   0-1   23790   23.52   24   0-1   23790   23.52   24   0-1   23790   23.52   24   0-1   23790   23.52   24   0-1   23790   23.52   24   0-1   23790   23.52   24   0-1   23790   23.52   24   0-1   23790   23.95   24   0-1   23790   23.95   24   0-1   23790   23.95   24   0-1   23790   23.95   24   0-1   23790   23.95   24   0-1   23790   23.95   24   0-1   23790   23.97   24   0-1   23790   23.97   24   0-1   23790   23.97   24   0-1   23790   23.98   23.90   23.98   24   0-1   23790   23.98   23.90   23.98   24   0-1   23790   23												
18			12 RB	6								
13												
1 RB 12 710. 23790 23.52 24 0-1 713.5 23825 23.51 24 0-1 713.5 23825 23.51 24 0-1 713.5 23825 23.52 24 0-1 713.5 23825 23.44 24 0-1 713.5 23825 23.44 24 0-1 713.5 23825 23.44 24 0-1 713.5 23825 23.44 24 0-1 713.5 23825 23.94 24 0-1 713.5 23825 23.94 24 0-1 713.5 23825 23.94 24 0-1 713.5 23825 23.94 24 0-1 713.5 23825 23.97 24 0-1 713.5 23825 23.97 24 0-1 713.5 23825 23.97 24 0-1 713.5 23825 23.97 24 0-1 713.5 23825 23.97 24 0-1 713.5 23825 23.97 24 0-1 713.5 23825 23.57 24 0-1 713.5 23825 23.57 24 0-1 713.5 23825 23.57 24 0-1 713.5 23825 22.57 23 0-2 713.5 23825 22.57 23 0-2 713.5 23825 22.57 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23825 22.57 23 0-2												
16-QAM  25RB  706.5  23755  23.51  24  0-1  710  23790  23.52  24  0-1  713.5  23825  23.44  24  0-1  710.5				13								
16-QAM  125RB    710   23790   23.52   24   0-1									0 0 0 0 0 0 0 0-1 0-1 0-1 0-1 0-1 0-1 0-			
16-QAM  1 RB  1 RB												
1 RB 12 706.5 23755 23.82 24 0-1 713.5 23825 23.94 24 0-1 715.5 23825 23.94 24 0-1 715.5 23825 23.94 24 0-1 715.5 23825 23.94 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.97 24 0-1 715.5 23825 23.57 24 0-1 715.5 23825 23.57 24 0-1 715.5 23825 23.57 24 0-1 715.5 23825 22.53 23 0-2 715.5 23825 22.57 23 0-2 715.5 23825 22.57 23 0-2 715.5 23825 22.57 23 0-2 715.5 23825 22.56 23 0-2 715.5 23825 22.56 23 0-2 715.5 23825 22.54 23 0-2 715.5 23825 22.54 23 0-2 715.5 23825 22.54 23 0-2 715.5 23825 22.54 23 0-2 715.5 23825 22.54 23 0-2 715.5 23825 22.54 23 0-2 715.5 23825 22.57 23 0-2 715.5 23825 2			25	irb								
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16-QAM  124  713.5  23825  23.97  24  0-1  706.5  23755  23.86  24  0-1  713.5  23825  23.98  24  0-1  713.5  23825  23.57  24  0-1  713.5  23825  23.57  24  0-1  706.5  23755  22.53  23  0-2  706.5  23755  22.54  23  0-2  713.5  23825  22.57  23  0-2  706.5  23755  22.52  23  0-2  706.5  23755  22.54  23  0-2  706.5  23790  22.54  23  0-2  713.5  23825  22.56  23  0-2  713.5  23825  22.56  23  0-2  713.5  23825  22.56  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.57  23  0-2  713.5  23825  22.57  23  0-2			1 DD	10					1			
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16-QAM  16-QAM  16-QAM  16-QAM  16-QAM  12 RB  10							23.51     24     0-       20     23.52     24     0-       25     23.44     24     0-       25     23.82     24     0-       20     23.95     24     0-       25     23.94     24     0-       25     23.93     24     0-       26     23.97     24     0-       25     23.97     24     0-       25     23.86     24     0-       20     23.98     24     0-					
16-QAM  16-QAM  0  713.5  23825  23.57  24  0-1  706.5  23755  22.53  23  0-2  710  23790  22.54  23  0-2  713.5  23825  22.57  23  0-2  706.5  23755  22.52  23  0-2  706.5  23755  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.57  23  0-2				24					1			
16-QAM  0  706.5  23755  22.53  23  0-2  710  23790  22.54  23  0-2  713.5  23825  22.57  23  0-2  706.5  23755  22.52  23  0-2  706.5  23755  22.52  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.56  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23825  22.54  23  0-2  713.5  23790  22.58  23  0-2  713.5  23825  22.57  23  0-2				24								
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12 RB 6 710 23790 22.54 23 0-2 706.5 23755 22.56 23 0-2 713.5 23825 22.56 23 0-2 713.5 23755 22.54 23 0-2 713.5 23755 22.54 23 0-2 713.5 23755 22.54 23 0-2 713.5 23755 22.54 23 0-2 713.5 23755 22.57 23 0-2 713.5 23825 22.57 23 0-2		16-OAM		0								
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713.5     23825     22.56     23     0-2       706.5     23755     22.54     23     0-2       13     710     23790     22.58     23     0-2       713.5     23825     22.57     23     0-2			12 PR	6					1			
706.5     23755     22.54     23     0-2       13     710     23790     22.58     23     0-2       713.5     23825     22.57     23     0-2			12 110									
13												
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25RB 710 23790 22.48 23 0-2			25	iRB								
713.5 23825 22.44 23 0-2									1			

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Page: 48 of 319

# WLAN802.11 a/b/g/n (20M/40M) conducted power table:

	802.11b	Max. Rated Avg.		Average Power	Output (dBm)			
СН	Frequency	Power + Max.	0					
СП	(MHz)	Tolerance (dBm)	1	2	5.5	11		
1	2412	16.00	15.86	15.79	15.65	15.54		
6	2437	16.00	15.92	15.87	15.75	15.68		
11	2462	16.00	15.82	15.71	15.63	15.51		

	802.11g	Max. Rated Avg.		Average Power Output(dBm)								
СН	Frequency	Power + Max.	Data Rate (Mbps)									
(MHz)	z) Tolerance (dBm)		9	12	18	24	36	48	54			
1	2412	15.00	14.99	14.85	14.76	14.66	14.52	14.41	14.35	14.22		
6	2437	15.00	14.75	14.62	14.54	14.41	14.34	14.21	14.12	14.08		
11	2462	15.00	14.67	14.51	14.42	14.38	14.31	14.22	14.15	14.03		

802	2.11n (20M)	Max. Rated Avg.	Average Power Output(dBm)							
СН	Frequency	Power + Max.	Data Rate (Mbps)							
СП	(MHz)	Tolerance (dBm)	6.5	13	19.5	26	39	52	58.5	65
1	2412	11.50	11.48	11.31	11.20	11.05	10.95	10.81	10.72	10.67
6	2437	11.50	11.49	11.38	11.18	11.02	10.91	10.75	10.64	10.51
11	2462	11.50	11.46	11.36	11.21	11.15	11.08	10.91	10.82	10.74

802	2.11n (40M)	Max. Rated Avg.	Average Power Output(dBm)							
CLI	Frequency	Power + Max.		Data Rate (Mbps)						
СН	(MHz)	Tolerance (dBm)	13.5	27	40.5	54	81	108	121.5	135
3	2422	11.50	11.49	11.33	11.21	11.15	11.04	10.94	10.82	10.73
6	2437	11.50	11.22	11.18	11.13	11.02	10.94	10.82	10.73	10.61
9	2452	11.50	11.48	11.32	11.17	11.09	10.92	10.75	10.70	10.62

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Page: 49 of 319

0/	02.11a	May Datad								
	3G/5.6G/5.8G	Max. Rated			Aver	age Po	wer (d	Bm)		
5.26/5.3		Avg. Power +				I. D.I	- /N All	- \		
СН	Frequency	Max. Tolerance		Data Rate (Mbps)					1	
	(MHz)	(dBm)	6	9	12	18	24	36	48	54
36	5180	14.00	13.99	13.82	13.69	13.52	13.44	13.31	13.25	13.17
40	5200	14.00	13.98	13.83	13.62	13.54	13.41	13.34	13.26	13.14
44	5220	14.00	13.74	13.61	13.52	13.41	13.34	13.22	13.14	13.05
48	5240	14.00	13.73	13.66	13.58	13.42	13.38	13.25	13.19	13.02
52	5260	14.00	13.84	13.78	13.70	13.62	13.54	13.28	13.17	13.01
56	5280	14.00	13.88	13.65	13.54	13.48	13.34	13.27	13.18	13.08
60	5300	14.00	13.96	13.91	13.82	13.64	13.55	13.45	13.34	13.22
64	5320	14.00	13.99	13.85	13.66	13.52	13.48	13.34	13.27	13.15
100	5500	14.00	13.78	13.62	13.52	13.47	13.32	13.24	13.17	13.08
104	5520	14.00	13.86	13.71	13.62	13.51	13.44	13.32	13.28	13.18
108	5540	14.00	13.89	13.75	13.64	13.57	13.42	13.34	13.27	13.21
112	5560	14.00	13.87	13.75	13.67	13.52	13.47	13.41	13.34	13.22
116	5580	14.00	13.80	13.72	13.62	13.54	13.42	13.34	13.21	13.05
132	5660	14.00	13.98	13.84	13.74	13.61	13.54	13.42	13.32	13.24
136	5680	14.00	13.63	13.52	13.42	13.31	13.28	13.14	13.10	13.02
140	5700	14.00	13.57	13.44	13.37	13.25	13.17	13.15	13.08	13.01
149	5745	14.00	13.70	13.62	13.51	13.41	13.32	13.22	13.13	13.08
153	5765	14.00	13.87	13.81	13.72	13.61	13.52	13.41	13.32	13.24
157	5785	14.00	13.74	13.62	13.51	13.40	13.32	13.24	13.17	13.02
161	5805	14.00	13.84	13.71	13.60	13.52	13.43	13.34	13.21	13.12
165	5825	14.00	13.81	13.72	13.68	13.59	13.48	13.38	13.25	13.14

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Page: 50 of 319

000	115/2014)	May Datad								
	11n(20M) 3G/5.6G/5.8G	Max. Rated Avg. Power +			Aver	age Po	wer (d	Bm)		
5.20/5.3		i		Data Rate (Mbps)						
СН	Frequency	Max. Tolerance					<u> </u>	<u> </u>		
	(MHz)	(dBm)	6.5	13	19.5	26	39	52	58.5	65
36	5180	13.00	12.69	12.52	12.44	12.34	12.27	12.18	12.12	12.05
40	5200	13.00	12.74	12.64	12.52	12.47	12.34	12.27	12.18	12.13
44	5220	13.00	12.77	12.68	12.58	12.41	12.37	12.21	12.18	12.14
48	5240	13.00	12.78	12.70	12.62	12.52	12.41	12.34	12.24	12.08
52	5260	13.00	12.83	12.75	12.65	12.51	12.44	12.32	12.28	12.19
56	5280	13.00	12.95	12.79	12.64	12.58	12.41	12.34	12.24	12.17
60	5300	13.00	12.96	12.85	12.71	12.62	12.58	12.49	12.41	12.35
64	5320	13.00	12.99	12.92	12.84	12.71	12.62	12.48	12.32	12.27
100	5500	13.00	12.73	12.61	12.52	12.42	12.33	12.24	12.12	12.08
104	5520	13.00	12.74	12.62	12.51	12.45	12.38	12.28	12.17	12.07
108	5540	13.00	12.80	12.75	12.62	12.51	12.43	12.37	12.28	12.08
112	5560	13.00	12.92	12.82	12.74	12.62	12.54	12.42	12.34	12.27
116	5580	13.00	12.51	12.43	12.37	12.24	12.17	12.15	12.08	12.03
132	5660	13.00	12.97	12.79	12.65	12.54	12.42	12.35	12.10	12.01
136	5680	13.00	12.91	12.82	12.73	12.57	12.49	12.32	12.27	12.05
140	5700	13.00	12.96	12.90	12.75	12.68	12.60	12.51	12.38	12.21
149	5745	13.00	12.77	12.63	12.51	12.44	12.32	12.28	12.19	12.05
153	5765	13.00	12.83	12.75	12.62	12.52	12.41	12.32	12.24	12.18
157	5785	13.00	12.77	12.64	12.51	12.42	12.37	12.31	12.24	12.05
161	5805	13.00	12.64	12.61	12.52	12.42	12.38	12.18	12.12	12.03
165	5825	13.00	12.71	12.62	12.54	12.48	12.34	12.27	12.15	12.07

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Page: 51 of 319

	11n(40M)	Max. Rated	Average Power (dBm)							
5.26/5.3	3G/5.6G/5.8G	Avg. Power +								
СН	Frequency	Max. Tolerance			Da	ita Rat	e (Mbp	s)		
СП	(MHz)	(dBm)	13.5	27	40.5	54	81	108	121.5	135
38	5190	10.50	10.28	10.21	10.16	10.09	10.01	9.93	9.81	9.75
46	5230	12.00	11.98	11.92	11.87	11.71	11.69	11.55	11.42	11.32
54	5270	12.00	11.97	11.91	11.82	11.73	11.65	11.52	11.44	11.31
62	5310	11.50	11.45	11.31	11.25	11.18	11.12	11.06	10.98	10.91
102	5510	11.50	11.35	11.25	11.19	11.11	11.04	10.97	10.84	10.72
110	5550	12.00	11.86	11.74	11.65	11.54	11.48	11.32	11.26	11.14
134	5670	12.00	11.98	11.95	11.84	11.74	11.69	11.63	11.52	11.44
151	5755	12.00	11.76	11.68	11.54	11.44	11.35	11.21	11.15	11.04
159	5795	12.00	11.84	11.75	11.66	11.59	11.47	11.32	11.25	11.14

## Bluetooth conducted power table:

Frequency	Peak (dBm)						
(MHz)	BDR	4DPSK	8DPSK				
2402	3.50	3.13	3.24				
2441	5.38	4.74	4.80				
2480	4.42	3.80	3.90				

Frequency	Avg. (dBm)				
(MHz)	BT4.0				
2402	-6				
2442	-3.86				
2480	-5.21				

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Page: 52 of 319

### 1.4 Test Environment

Ambient Temperature: 22±2° C Tissue Simulating Liquid: 22±2° C

## 1.5 Operation Description

### **General:**

- 1. The EUT is controlled by using a Radio Communication Tester (R&S CMU200 and Antrisu MT8820C), and the communication between the EUT and the tester is established by air link.
- Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
- 3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
- 4. Testing head SAR at lowest, middle and highest channel for all bands with Left Tilt /Left Cheek/Right Tilt/Right Cheek conditions.
- 5. Testing body-worn SAR by separating the EUT and the phantom **15mm** distance when performing GSM850/1900, WCDMA Band II/IV/V, LTE Band 2/4/5/7/12/13/17 and WLAN 5G. (Both front side & back side)
- 6. Testing hotspot mode SAR by separating the EUT and the phantom **10mm** distance.
  - #. The SAR testing for portable devices with wireless router capability is referred as test guidance of KDB 941225D06v02 (SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities).
  - #. The following procedures are applicable when the overall device length and width are ≥9 cm x 5 cm respectively. A test separation of 10 mm is required. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge, for the data modes, wireless technologies and frequency bands supporting hotspot mode.

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Page: 53 of 319

# For WLAN 2.4G (15mm separation): the testing device support mobile hotspot function, the separation distance is 10mm (No need to perform body-worn SAR testing due to the hotspot mode (10mm separation distance) is more conservative than body-worn mode (15mm separation distance).

Test configurations:

- (1) Front side
- (2) Back side
- (3) Top side. (WWAN antenna to edge distance > 25mm\_ No SAR measurement is necessary for this configuration)
- (4) Bottom side. (WLAN antenna to edge distance >25mm\_ No SAR measurement is necessary for this configuration)
- (5) Right side. (WLAN antenna to edge distance >25mm\_ No SAR measurement is necessary for this configuration)
- (6) Left side.
- 7. According to KDB447498D01v05r02 The 1-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances≤ 50 mm are determined by: [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]  $\cdot [\sqrt{f(GHz)}] \le 3.0$  for 1-g SAR, SAR evaluation is not required. (Max power of Bluetooth = 5.38 dBm)

When SAR evaluation is not required to be measured, per FCC KDB447498D01v05r02, the following equation must be used to estimate the 1g SAR for simultaneous transmission assessment involving that transmitter.

Estimated SAR =  $[\sqrt{f(GHz)/7.5}] \cdot [(max. power of channel, mW)/(min. test separation)]$ distance, mm)]

Estimated 10g SAR =  $[\sqrt{f(GHz)/18.75}] \cdot [(max. power of channel, mW)/(min. test)]$ separation distance, mm)]

Mode	Frequency (MHz)			Estimated SAR 1g (Body) (W/kg)	
Bluetooth	2441	5.38	15	0.048	
Bluetooth	2441	5.38	10	0.072	

8. The SAR measurement for EDGE mode is not required since the source-based time-averaged power for EDGE mode is lower than that for GPRS mode.

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Page: 54 of 319

- 9. The SAR measurement is not required for HSPA since its maximum output power is less than ¼ dB higher than RMC without HSPA.
- 10. The SAR measurement is not required for HSPA+ since its maximum output power is less than ¼ dB higher than RMC without HSPA+.
- 11. LTE modes test according to KDB 941225D05v02r03.
  - a. Per Section 5.2.1, the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation.
    - Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
    - When the reported SAR is  $\leq 0.8$  W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
    - When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
  - b. Per Section 5.2.2, the largest channel bandwidth and measure SAR for QPSK with 50% RB allocation
    - The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.
  - c. Per Section 5.2.3, the largest channel bandwidth and measure SAR for QPSK with 100% RB allocation
    - For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are  $\leq$  0.8 W/kg.
    - Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
  - d. Per Section 5.2.4, Higher order modulations
    - For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 5.2.1, 5.2.2 and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration

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Page: 55 of 319

identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > 1/2 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

- e. Per Section 5.3, other channel bandwidth standalone SAR test requirements
  - For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > 1/2 dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.
  - The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.
- 12. The SAR measurement is not required for 802.11g/n since its maximum output power is less than 1/4 dB higher than 802.11b.
- 13. The SAR measurement is not required for 802.11n since its maximum output power is less than 1/4 dB higher than 802.11a.
- 14. The highest body SAR configuration is repeated with a headset attached.
- 15. According to KDB447498D01v05r02, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is ≤ 0.8 W/kg, when the transmission band is  $\leq$  100 MHz.
- 16. According to KDB447498D01v05r02, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is  $\leq$  0.6 W/kg, when the transmission band is between 100 MHz and 200MHz.
- 17. According to KDB447498 D01v05r02, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is  $\leq$  0.4 W/kg, when the transmission band is  $\geq$  200MHz.
- 18. According to KDB865664D01v01r03, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is ≥ 0.8 W/kg, repeated that measurement once. Perform a second repeated measurement only if

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Page: 56 of 319

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  $\ge 1.45$  W/kg ( $\sim 10\%$  from the 1-g SAR limit)

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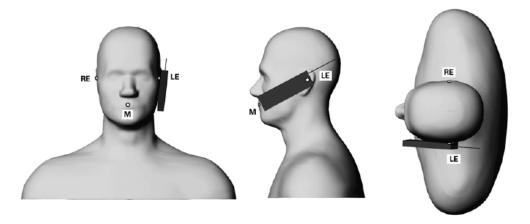
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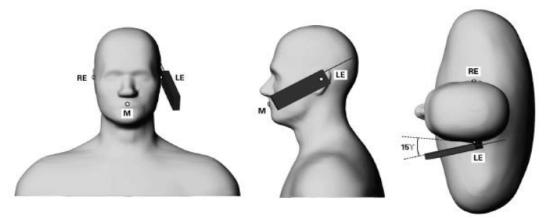


Page: 57 of 319

# 1.6 Positioning Procedure



Phone position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

#### Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

#### Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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Page: 58 of 319

#### 1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- 1. The extraction of the measured data (grid and values) from the Zoom Scan.
- 2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
- 3. The generation of a high-resolution mesh within the measured volume.
- 4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
- 5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
- 6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for

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Page: 59 of 319

most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found.

If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

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Page: 60 of 319

#### 1.8 Probe Calibration Procedures

For the calibration of E-field probes in lossy liquids, an electric field with an accurately known field strength must be produced within the measured liquid. For standardization purposes it would be desirable if all measurements which are necessary to assess the correct field strength would be traceable to standardized measurement procedures. In the following two different calibration techniques are summarized:

### 1.8.1 Transfer Calibration with Temperature Probes

In lossy liquids the specific absorption rate (SAR) is related both to the electric field (E) and the temperature gradient  $(\delta T / \delta t)$  in the liquid.

$$SAR = \frac{\sigma}{\rho} |E|^2 = c \frac{\delta T}{\delta t}$$

Whereby  $\sigma$  is the conductivity,  $\rho$  the density and c the heat capacity of the liquid.

Hence, the electric field in lossy liquid can be measured indirectly by measuring the temperature gradient in the liquid. Non-disturbing temperature probes (optical probes or thermistor probes with resistive lines) with high spatial resolution (<1-2 mm) and fast reaction time (<1 s) are available and can be easily calibrated with high precision [1]. The setup and the exciting source have no influence on the calibration; only the relative positioning uncertainties of the standard temperature probe and the E-field probe to be calibrated must be considered. However, several problems limit the available accuracy of probe calibrations with temperature probes:

 The temperature gradient is not directly measurable but must be evaluated from temperature measurements at different time steps. Special precaution is necessary to avoid measurement errors caused by temperature gradients due to energy equalizing effects or convection currents in the liquid. Such effects cannot be completely avoided, as the measured field itself destroys the thermal equilibrium in the liquid. With a careful setup these errors can be kept small.

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Page: 61 of 319

• The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.

- The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures ( $\sim 2\%$  for c; much better for  $\rho$ ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed  $\pm 5\%$ .
- Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

Considering these problems, the possible accuracy of the calibration of E-field probes with temperature gradient measurements in a carefully designed setup is about  $\pm 10\%$  (RSS) [2]. Recently, a setup which is a combination of the waveguide techniques and the thermal measurements was presented in [3]. The estimated uncertainty of the setup is  $\pm 5\%$  (RSS) when the same liquid is used for the calibration and for actual measurements and  $\pm 7-9\%$ (RSS) when not, which is in good agreement with the estimates given in [2].

## 1.8.2 Calibration with Analytical Fields

In this method a technical setup is used in which the field can be calculated analytically from measurements of other physical magnitudes (e.g., input power). This corresponds to the standard field method for probe calibration in air; however, there is no standard defined for fields in lossy liquids.

When using calculated fields in lossy liquids for probe calibration, several points must be considered in the assessment of the uncertainty:

• The setup must enable accurate determination of the incident power.

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Page: 62 of 319

- The accuracy of the calculated field strength will depend on the assessment of the dielectric parameters of the liquid.
- Due to the small wavelength in liquids with high permittivity, even small setups might be above the resonant cutoff frequencies. The field distribution in the setup must be carefully checked for conformity with the theoretical field distribution.

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Page: 63 of 319

## 1.9 The SAR Measurement System

A block diagram of the SAR measurement system is given in Fig. a. This SAR measurement system uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). Model EX3DV4 field probes are used to determine the internal electric fields. The SAR can be obtained from the equation SAR=  $\sigma$  ( $|Ei|^2$ )/  $\rho$ where  $\sigma$  and  $\rho$  are the conductivity and mass density of the tissue-simulant.

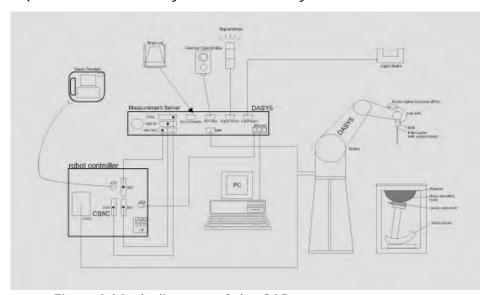


Fig. a A block diagram of the SAR measurement system

The DASY 5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- 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.

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Page: 64 of 319

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7
- DASY 5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

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Page: 65 of 319

## 1.10 System Components

### **EX3DV4 E-Field Probe**

Construction	Symmetrical design with triangular core Built-in
	shielding against static charges PEEK enclosure
	material (resistant to organic solvents, e.g.,
	DGBE)
Calibration	Basic Broad Band Calibration in air
	Conversion Factors (CF) for HSL 750/835/1750
	/1900/2450/2600/5200/5300/5600/5800 MHz
	Additional CF for other liquids and frequencies
	upon request
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.6 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis)
	± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic	$10 \mu W/g \text{ to } > 100 \text{ mW/g}$
Range	Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Dimensions	Tip diameter: 2.5 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g.,
	very strong gradient fields). Only probe which enables compliance testing
	for frequencies up to 6 GHz with precision of better 30%.

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Page: 66 of 319

## **SAM PHANTOM V4.0C**

Construction: The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot. Shell Thickness: 2 ± 0.2 mm Filling Volume: Approx. 25 liters

Dimensions: Height: 210 mm; Length: 1000 mm; Width: 500 mm



#### **DEVICE HOLDER**

	<del></del>
Construction	In combination with the Twin SAM Phantom
	V4.0/V4.0C or Twin SAM, the Mounting
	Device (made from POM) enables the rotation
	of the mounted transmitter in spherical
	coordinates, whereby the rotation point is the
	ear opening. The devices can be easily and
	accurately positioned according to IEC, IEEE,
	CENELEC, FCC or other specifications. The
	device holder can be locked at different
	phantom locations (left head, right head, flat
	phantom).



Device Holder

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Page: 67 of 319

# 1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% (according to KDB865664 D01) from the target SAR values.

These tests were done at 750/835/1750/1900/2450/2600/5200/5300/5600/5800 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was  $21.7^{\circ}$ C, the relative humidity was 62% and the liquid depth above the ear reference points was above 15 cm ( $\leq 3$ G) or 10 cm (> 3G) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

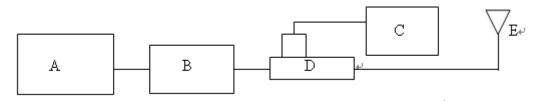
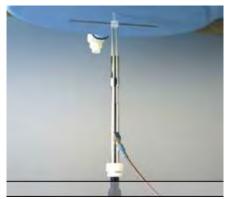


Fig. b The block diagram of system verification

- A. Signal Generator
- B. Amplifier
- C. Power Sensor
- D. Dual Directional Coupling
- E. Reference Dipole Antenna



Photograph of the Dipole Antenna

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Page: 68 of 319

Validation Kit	S/N	Frequ (MI	•	Target SAR (1g) (Pin=250mW)	Measured SAR (1g)(mW/g)	Deviation (%)	Measured Date
			Head	2.11	2.13	-0.95%	Nov. 21, 2014
D750V2	1015	750	Body	2.24	2.28	-1.79%	Nov. 28, 2014
			Бойу	2.24	2.27	-1.34%	Nov. 29, 2014
			Head	2.38	2.39	-0.42%	Nov. 16, 2014
D835V2	4d063	835	Heau	2.38	2.51	-5.46%	Nov. 26, 2014
	40003	033	Body	2.41	2.46	-2.07%	Nov. 16, 2014
			Войу	2.41	2.47	-2.49%	Nov. 27, 2014
			Head	9.26	9.34	-0.86%	Nov. 17, 2014
D1750V2	1008	1750	пеац	9.26	8.98	3.02%	Nov. 22, 2014
D1/30V2	1006	006 1750	Pody	9.44	9.38	0.64%	Nov. 17, 2014
			Body	9.44	9.48	-0.42%	Nov. 23, 2014
	5d027	27 1900	Head	9.71	9.78	-0.72%	Nov. 18, 2014
D1900V2				9.71	9.68	0.31%	Nov. 24, 2014
D 1900 V 2		1900	Pody	9.87	9.94	-0.71%	Nov. 18, 2014
			Body	9.87	10.2	-3.34%	Nov. 25, 2014
D2450V2	727	2450	Head	13.1	13.4	-2.29%	Nov. 23, 2014
D2430V2	121	2430	Body	12.8	13.1	-2.34%	1100. 23, 2014
D2600V2	1005	2600	Head	14.7	14.9	-1.36%	Nov. 30, 2014
D2000V2	1005	2000	Body	14.3	14.4	-0.70%	Dec. 01, 2014
		5200	Head	8.02	8.37	-4.36%	Nov. 17, 2014
		3200	Body	7.69	7.59	1.30%	Nov. 19, 2014
		5300	Head	8.45	8.32	1.54%	Nov. 18, 2014
D5GHzV2	1104	3300	Body	7.84	7.83	0.13%	Nov. 19, 2014
DOGUTAN	1104	5600	Head	8.31	8.74	-5.17%	Nov. 17, 2014
		3000	Body	8.21	8.4	-2.31%	Nov. 19, 2014
		5000	Head	7.95	8.11	-2.01%	Nov. 18, 2014
		5800	Body	7.73	7.72	0.13%	Nov. 19, 2014

Table 1. System validation (follow manufacture target value)

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Page: 69 of 319

## 1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070E Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjuncation with Network Analyzer.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was at least 15 cm (≤3G) or 10 cm (>3G) during all tests. (Appendix Fig. 2)

Tissue Type	Measured Frequency (MHz)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, Er	Measured Conductivity, σ (S/m)	% dev ɛr	% dev σ	Measurement Date
	703	42.186	0.890	43.087	0.86	-2.14%	3.34%	
	707	42.165	0.890	43.029	0.865	-2.05%	2.81%	
	709	42.155	0.890	43.012	0.867	-2.03%	2.58%	
Head	710	42.149	0.890	42.999	0.867	-2.02%	2.58%	Nov.21, 2014
	711	42.144	0.890	42.988	0.868	-2.00%	2.47%	
	750	41.942	0.893	42.233	0.902	-0.69%	-1.01%	
	782	41.775	0.896	41.921	0.929	-0.35%	-3.70%	
	703	55.714	0.960	54.772	0.924	1.69%	3.72%	
	707	55.699	0.960	54.731	0.927	1.74%	3.44%	Nov.28, 2014
	711	55.683	0.960	54.711	0.931	1.75%	3.02%	
	750	55.531	0.963	54.319	0.972	2.18%	-0.93%	
Body	782	55.406	0.966	53.993	1.004	2.55%	-3.95%	
	709	55.691	0.960	54.704	0.932	1.77%	2.92%	
	710	55.687	0.960	54.695	0.933	1.78%	2.81%	Nov.29, 2014
	711	55.683	0.960	54.687	0.934	1.79%	2.71%	
	750	55.531	0.963	54.296	0.976	2.22%	-1.35%	
	824.2	41.556	0.899	41.299	0.872	0.62%	3.02%	
Head	826.4	41.545	0.899	41.273	0.874	0.65%	2.78%	Nov.16, 2014
	835	41.500	0.900	41.166	0.883	0.80%	1.89%	
	836.6	41.500	0.902	41.14	0.885	0.87%	1.88%	
	846.6	41.500	0.912	41.012	0.894	1.18%	1.97%	
	848.8	41.500	0.915	40.986	0.896	1.24%	2.08%	

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Page: 70 of 319

Tissue Type	Measured Frequency (MHz)	Target Dielectric Constant, Er	Target Conductivity, σ (S/m)	Measured Dielectric Constant, Er	Measured Conductivity, σ (S/m)	% dev ɛr	% dev σ	Measurement Date
Dody	824.2	55.242	0.969	52.976	1.001	4.10%	-3.29%	
	826.4	55.234	0.969	52.958	1.003	4.12%	-3.51%	
	835	55.2	0.97	52.886	1.013	4.19%	-4.43%	Nov.16, 2014
Body	836.6	55.195	0.972	52.87	1.015	4.21%	-4.42%	
	846.6	55.164	0.984	52.785	1.025	4.31%	-4.17%	
	848.8	55.158	0.987	52.766	1.027	4.34%	-4.05%	
	829	41.531	0.9	41.237	0.891	0.71%	1.00%	Nov.26, 2014
Head	835	41.500	0.9	41.143	0.897	0.86%	0.33%	
пеаи	836.5	41.500	0.902	41.125	0.898	0.90%	0.44%	
	844	41.500	0.91	41.006	0.906	1.19%	0.44%	
	829	55.223	0.97	53.413	0.965	3.28%	0.52%	Nov.27, 2014
Pody	835	55.2	0.97	53.304	0.969	3.43%	0.10%	
Body	836.5	55.195	0.972	53.278	0.97	3.47%	0.21%	
	844	55.172	0.981	53.195	0.977	3.58%	0.41%	
	1712.4	40.138	1.349	39.584	1.343	1.38%	0.44%	
Head	1732.4	40.107	1.361	39.598	1.364	1.27%	-0.22%	
пеаи	1750	40.079	1.371	39.564	1.377	1.28%	-0.44%	Nov. 17, 2014
	1752.6	40.075	1.373	39.547	1.379	1.32%	-0.44%	
	1712.4	53.531	1.465	54.496	1.43	-1.80%	2.39%	
Body	1732.4	53.478	1.477	54.47	1.444	-1.85%	2.23%	
Бойу	1750	53.432	1.488	54.404	1.457	-1.82%	2.08%	
	1752.6	53.425	1.49	54.388	1.459	-1.80%	2.08%	
	1720	40.126	1.354	40.675	1.362	-1.37%	-0.59%	Nov. 22, 2014
Head	1732.5	40.107	1.361	40.628	1.379	-1.30%	-1.32%	
	1745	40.187	1.368	40.605	1.386	-1.04%	-1.32%	
	1750	40.079	1.371	40.597	1.391	-1.29%	-1.46%	
	1720	53.511	1.469	53.954	1.442	-0.83%	1.84%	Nov. 23, 2014
Body	1732.5	53.478	1.477	53.838	1.451	-0.67%	1.76%	
воау	1745	53.445	1.485	53.779	1.464	-0.62%	1.41%	
	1750	53.432	1.488	53.752	1.471	-0.60%	1.14%	

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Page: 71 of 319

Tissue Type	Measured Frequency (MHz)	Target Dielectric Constant, Er	Target Conductivity, σ (S/m)	Measured Dielectric Constant, Er	Measured Conductivity, σ (S/m)	% dev εr	% dev σ	Measurement Date
	1850.2	40.000	1.400	39.531	1.331	1.17%	4.93%	
	1852.4	40.000	1.400	39.522	1.332	1.20%	4.86%	
Hood	1880	40.000	1.400	39.435	1.361	1.41%	2.79%	
Head	1900	40.000	1.400	39.35	1.38	1.63%	1.43%	
	1907.6	40.000	1.400	39.314	1.388	1.72%	0.86%	
	1909.8	40.000	1.400	39.304	1.389	1.74%	0.79%	N 10 2014
	1850.2	53.300	1.520	52.205	1.445	2.05%	4.93%	Nov. 18, 2014
	1852.4	53.300	1.520	52.194	1.446	2.08%	4.87%	
Dody	1880	53.300	1.520	52.026	1.467	2.39%	3.49%	
Body	1900	53.300	1.520	51.93	1.491	2.57%	1.91%	
	1907.6	53.300	1.520	51.911	1.502	2.61%	1.18%	
	1909.8	53.300	1.520	51.909	1.504	2.61%	1.05%	
	1860	40.000	1.400	41.136	1.374	-2.84%	1.86%	
Head	1880	40.000	1.400	41.123	1.383	-2.81%	1.21%	Nov. 24, 2014
	1900	40.000	1.400	41.116	1.42	-2.79%	-1.43%	
	1860	53.300	1.520	51.904	1.499	2.62%	1.38%	
Body	1880	53.300	1.520	51.855	1.52	2.71%	0.00%	Nov. 25, 2014
	1900	53.300	1.520	51.826	1.542	2.77%	-1.45%	
	2412	39.268	1.766	39.3	1.779	-0.08%	-0.74%	
Head	2437	39.223	1.788	39.231	1.808	-0.02%	-1.12%	
пеаи	2450	39.200	1.800	39.185	1.823	0.04%	-1.28%	
	2462	39.185	1.813	39.117	1.836	0.17%	-1.27%	
	2412	52.751	1.914	50.237	1.992	4.77%	-4.08%	Nov. 23, 2014
	2437	52.717	1.938	50.142	2.027	4.88%	-4.59%	
Body	2450	52.700	1.950	50.104	2.045	4.93%	-4.87%	
	2462	52.685	1.967	50.06	2.063	4.98%	-4.88%	
	2510	39.124	1.865	38.986	1.879	0.35%	-0.75%	Nov. 30, 2014
	2535	39.092	1.893	39.916	1.908	-2.11%	-0.79%	
Head	2560	39.060	1.920	38.831	1.928	0.59%	-0.42%	
	2600	39.009	1.964	38.778	1.972	0.59%	-0.41%	
	2510	52.624	2.035	51.72	2.021	1.72%	0.69%	Dec. 01, 2014
	2535	52.592	2.071	51.673	2.055	1.75%	0.77%	
Body	2560	52.560	2.106	51.581	2.093	1.86%	0.62%	
	2600	52.509	2.163	51.492	2.138	1.94%	1.16%	

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Page: 72 of 319

Tissue Type	Measured Frequency (MHz)	Target Dielectric Constant, Er	Target Conductivity, σ (S/m)	Measured Dielectric Constant, Er	Measured Conductivity, σ (S/m)	% dev εr	% dev σ	Measurement Date
	5180	36.009	4.635	36.126	4.589	-0.33%	0.98%	
	5200	35.986	4.655	36.074	4.618	-0.25%	0.79%	
	5220	35.963	4.676	36.058	4.652	-0.26%	0.50%	
	5540	35.597	5.004	35.288	5.017	0.87%	-0.27%	Nov. 17, 2014
	5560	35.574	5.024	35.255	5.037	0.90%	-0.26%	
	5600	35.529	5.065	35.142	5.081	1.09%	-0.32%	
Head	5660	35.460	5.127	35.031	5.153	1.21%	-0.52%	
пеац	5280	35.894	4.737	35.889	4.705	0.01%	0.68%	
	5300	35.871	4.758	35.828	4.731	0.12%	0.56%	
	5320	35.849	4.778	35.798	4.767	0.14%	0.23%	
	5765	35.340	5.234	34.758	5.276	1.65%	-0.80%	Nov. 18, 2014
	5800	35.300	5.270	34.701	5.315	1.70%	-0.85%	
	5805	35.294	5.275	34.677	5.321	1.75%	-0.87%	
	5825	35.271	5.296	34.595	5.342	1.92%	-0.88%	
	5180	49.041	5.276	48.660	5.393	0.78%	-2.22%	
	5200	49.014	5.299	48.601	5.407	0.84%	-2.03%	
	5220	48.987	5.323	48.468	5.430	1.06%	-2.02%	
	5280	48.906	5.393	48.364	5.556	1.11%	-3.03%	
	5300	48.879	5.416	48.323	5.571	1.14%	-2.86%	
Body	5320	48.851	5.439	48.196	5.590	1.34%	-2.77%	
	5540	48.553	5.696	47.536	5.945	2.09%	-4.36%	Na.: 10 2014
	5560	48.526	5.720	47.462	6.002	2.19%	-4.94%	Nov. 19, 2014
	5600	48.471	5.766	47.501	6.041	2.00%	-4.76%	
	5660	48.390	5.837	47.180	6.058	2.50%	-3.80%	
	5765	48.248	5.959	46.908	6.161	2.78%	-3.39%	
	5800	48.200	6.000	46.941	6.200	2.61%	-3.33%	
	5805	48.193	6.006	46.936	6.213	2.61%	-3.45%	
	5825	48.166	6.029	46.889	6.263	2.65%	-3.88%	

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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Page: 73 of 319

The composition of the brain tissue simulating liquid:

The compos				<u> </u>	edient			T.1.1
Frequency (MHz)	Mode	DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	Total amount
750	Head		532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
750	Body		631.68 g	11.72 g	1.2 g		600 g	1.0L(Kg)
050	Head		532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
850	Body		631.68 g	11.72 g	1.2 g		600 g	1.0L(Kg)
1750	Head	444.52 g	552.42 g	3.06 g		_	_	1.0L(Kg)
1750	Body	300.67 g	716.56 g	4.0 g		_	_	1.0L(Kg)
1000	Head	444.52 g	552.42 g	3.06 g		_	_	1.0L(Kg)
1900	Body	300.67 g	716.56 g	4.0 g		_		1.0L(Kg)
2450	Head	550ml	450ml	_		_	_	1.0L(Kg)
2450	Body	301.7ml	698.3ml	_		_	_	1.0L(Kg)
2400	Head	550ml	450ml	_				1.0L(Kg)
2600	Body	301.7ml	698.3ml	_			<u> </u>	1.0L(Kg)

## Simulating Liquids for 5 GHz, Manufactured by SPEAG:

Ingredients	Water	Esters, Emulsifiers, Inhibitors	Sodium and Salt
(% by weight)	60-80	20-40	0-1.5

Table 3. Recipes for tissue simulating liquid

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Page: 74 of 319

#### 1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1-1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over a 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

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Page: 75 of 319

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section. (Table .6)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR (Brain)	1.60 m W/g	8.00 m W/g
Spatial Average SAR (Whole Body)	0.08 m W/g	0.40 m W/g
Spatial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 m W/g	20.00 m W/g

Table 4. RF exposure limits

#### Notes:

- 1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
- 2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

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Page: 76 of 319

# 2. Summary of Results

#### **GSM 850 MHz**

Mode	Position	Distanc e (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged 1 (W/ Measured	g kg)	Plot page
	Re Cheek	-	251	848.8	33.50	33.30	4.71%	0.511	0.535	-
	Re Tilt	-	251	848.8	33.50	33.30	4.71%	0.298	0.312	=.
GSM850	Le Cheek	-	128	824.2	33.50	33.00	12.20%	0.515	0.578	-
(GMSK) (Head)	Le Cheek	-	190	836.6	33.50	33.10	9.65%	0.602	0.660	120
(1.500)	Le Cheek	-	251	848.8	33.50	33.30	4.71%	0.600	0.628	-
	Le Tilt	-	251	848.8	33.50	33.30	4.71%	0.317	0.332	-
GSM850	Front side	15	251	848.8	33.50	33.30	4.71%	0.254	0.266	-
(GMSK)	Back side	15	128	824.2	33.50	33.00	12.20%	0.295	0.331	-
(Speech	Back side	15	190	836.6	33.50	33.10	9.65%	0.353	0.387	-
mode)	Back side	15	251	848.8	33.50	33.30	4.71%	0.399	0.418	121
	Front side	10	251	848.8	33.50	33.30	4.71%	0.532	0.557	-
	Back side	10	128	824.2	33.50	33.00	12.20%	0.653	0.733	-
GPRS850	Back side	10	190	836.6	33.50	33.10	9.65%	0.702	0.770	122
(GMSK)	Back side	10	251	848.8	33.50	33.30	4.71%	0.701	0.734	-
(Hotspot)	Bottom side	10	251	848.8	33.50	33.30	4.71%	0.255	0.267	-
	Right side	10	251	848.8	33.50	33.30	4.71%	0.336	0.352	
	Left side	10	251	848.8	33.50	33.30	4.71%	0.627	0.657	-

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Page: 77 of 319

#### **GSM 1900 MHz**

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance	Measured Avg. Power (dBm)	Scaling	1	SAR over g /kg) Reported	Plot page
	Re Cheek	-	512	1850.2	30.50	29.80	17.49%	0.148	0.174	-
	Re Cheek	-	661	1880	30.50	29.90	14.82%	0.171	0.196	-
GSM1900	Re Cheek	-	810	1909.8	30.50	30.10	9.65%	0.194	0.213	123
(GMSK) (Head)	Re Tilt	-	810	1909.8	30.50	30.10	9.65%	0.052	0.057	-
(Fload)	Le Cheek	-	810	1909.8	30.50	30.10	9.65%	0.176	0.193	-
	Le Tilt	-	810	1909.8	30.50	30.10	9.65%	0.054	0.059	-
GSM1900	Front side	15	810	1909.8	30.50	30.10	9.65%	0.287	0.315	-
(GMSK)	Back side	15	512	1850.2	30.50	29.80	17.49%	0.314	0.369	-
(Speech	Back side	15	661	1880	30.50	29.90	14.82%	0.318	0.365	-
mode)	Back side	15	810	1909.8	30.50	30.10	9.65%	0.326	0.357	124
	Front side	10	810	1909.8	30.50	30.10	9.65%	0.466	0.511	-
	Back side	10	810	1909.8	30.50	30.10	9.65%	0.548	0.601	-
GPR S1 900	Bottom side	10	512	1850.2	30.50	29.80	17.49%	0.538	0.632	-
(GMSK)	Bottom side	10	661	1880	30.50	29.90	14.82%	0.562	0.645	-
(Hotspot)	Bottom side	10	810	1909.8	30.50	30.10	9.65%	0.662	0.726	125
	Right side	10	810	1909.8	30.50	30.10	9.65%	0.120	0.132	-
	Left side	10	810	1909.8	30.50	30.10	9.65%	0.094	0.103	-

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Page: 78 of 319

#### WCDMA Band II

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling	Averaged S (W/	•	Plot page
R99 (Head)  Body-worn (speech mode)		(11111)		(IVII IZ)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	9262	1852.4	24.5	24.25	5.93%	0.308	0.326	-
	RE Cheek	-	9400	1880	24.5	24.17	7.89%	0.33	0.356	-
R99	RE Cheek	-	9538	1907.6	24.5	24.40	2.33%	0.352	0.360	126
(Head)	RE Tilt	-	9538	1907.6	24.5	24.40	2.33%	0.099	0.101	-
	LE Cheek	-	9538	1907.6	24.5	24.40	2.33%	0.338	0.346	-
	LE Tilt	-	9538	1907.6	24.5	24.40	2.33%	0.1	0.102	-
	Front side	15	9262	1852.4	24.5	24.25	5.93%	0.485	0.514	-
, ,	Front side	15	9400	1880	24.5	24.17	7.89%	0.505	0.545	-
, ,	Front side	15	9538	1907.6	24.5	24.40	2.33%	0.563	0.576	127
modoj	Back side	15	9538	1907.6	24.5	24.40	2.33%	0.484	0.495	-
	Front side	10	9262	1852.4	24.5	24.25	5.93%	0.768	0.814	-
	Front side	10	9400	1880	24.5	24.17	7.89%	0.796	0.859	-
	Front side	10	9538	1907.6	24.5	24.40	2.33%	0.838	0.858	-
	Back side	10	9262	1852.4	24.5	24.25	5.93%	0.993	1.052	-
	Back side	10	9400	1880	24.5	24.17	7.89%	1.12	1.208	-
Hotspot	Back side	10	9538	1907.6	24.5	24.40	2.33%	1.25	1.279	-
πυιδρυι	Bottom side	10	9262	1852.4	24.5	24.25	5.93%	1.05	1.112	-
	Bottom side	10	9400	1880	24.5	24.17	7.89%	1.05	1.133	-
	Bottom side	10	9538	1907.6	24.5	24.40	2.33%	1.34	1.371	128
	Bottom side*	10	9538	1907.6	24.5	24.40	2.33%	1.28	1.310	-
	Right side	10	9538	1907.6	24.5	24.40	2.33%	0.235	0.240	-
	Left side	10	9538	1907.6	24.5	24.40	2.33%	0.184	0.188	-

<sup>\* -</sup> repeated at the highest SAR measurement according to the KDB865664D01v01r03

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Page: 79 of 319

#### WCDMA Band IV

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling	Averaged S (W/		Plot page
R99 (Head)  Body-worn (speech mode)  Hotspot		(11111)		(IVII IZ)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	1312	1712.4	24.5	24.40	2.33%	0.4	0.409	-
	RE Cheek	-	1412	1732.4	24.5	24.43	1.62%	0.43	0.437	129
R99	RE Cheek	-	1513	1752.6	24.5	24.35	3.51%	0.39	0.404	-
(Head)	RE Tilt	-	1412	1732.4	24.5	24.43	1.62%	0.163	0.166	-
	LE Cheek	-	1412	1732.4	24.5	24.43	1.62%	0.387	0.393	-
	LE Tilt	-	1412	1732.4	24.5	24.43	1.62%	0.118	0.120	-
	Front side	15	1312	1712.4	24.5	24.40	2.33%	0.58	0.594	-
Body-worn	Front side	15	1412	1732.4	24.5	24.43	1.62%	0.59	0.600	130
(speech mode)	Front side	15	1513	1752.6	24.5	24.35	3.51%	0.575	0.595	-
	Back side	15	1412	1732.4	24.5	24.43	1.62%	0.561	0.570	-
	Front side	10	1312	1712.4	24.5	24.40	2.33%	0.985	1.008	-
	Front side	10	1412	1732.4	24.5	24.43	1.62%	1.01	1.026	-
	Front side	10	1513	1752.6	24.5	24.35	3.51%	0.969	1.003	-
	Back side	10	1312	1712.4	24.5	24.40	2.33%	1.19	1.218	-
	Back side	10	1412	1732.4	24.5	24.43	1.62%	1.07	1.087	-
Hotspot	Back side	10	1513	1752.6	24.5	24.35	3.51%	1.33	1.377	-
потѕрот	Back side*	10	1513	1752.6	24.5	24.35	3.51%	1.35	1.397	131
	Bottom side	10	1312	1712.4	24.5	24.40	2.33%	0.98	1.003	-
	Bottom side	10	1412	1732.4	24.5	24.43	1.62%	1.1	1.118	-
	Bottom side	10	1513	1752.6	24.5	24.35	3.51%	1.18	1.221	-
	Right side	10	1412	1732.4	24.5	24.43	1.62%	0.246	0.250	-
	Left side	10	1412	1732.4	24.5	24.43	1.62%	0.214	0.217	-

<sup>\* -</sup> repeated at the highest SAR measurement according to the KDB865664D01v01r03

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Page: 80 of 319

#### WCDMA Band V

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling	Averaged S (W/	AR over 1g 'kg)	Plot page
		(11111)		(1711 12)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	4132	826.4	24.5	24.37	3.04%	0.427	0.440	-
	RE Tilt	-	4132	826.4	24.5	24.37	3.04%	0.244	0.251	-
R99	LE Cheek	-	4132	826.4	24.5	24.37	3.04%	0.491	0.506	-
(Head)	LE Cheek	-	4183	836.6	24.5	24.27	5.44%	0.523	0.551	-
	LE Cheek	-	4233	846.6	24.5	24.10	9.65%	0.552	0.605	132
	LE Tilt	-	4132	826.4	24.5	24.37	3.04%	0.256	0.264	-
	Front side	15	4132	826.4	24.5	24.37	3.04%	0.271	0.279	-
Body-worn	Back side	15	4132	826.4	24.5	24.37	3.04%	0.298	0.307	-
(speech mode)	Back side	15	4183	836.6	24.5	24.27	5.44%	0.311	0.328	-
	Back side	15	4233	846.6	24.5	24.10	9.65%	0.429	0.470	133
	Front side	10	4132	826.4	24.5	24.37	3.04%	0.662	0.682	-
	Back side	10	4132	826.4	24.5	24.37	3.04%	0.964	0.993	134
	Back side*	10	4132	826.4	24.5	24.37	3.04%	0.959	0.988	-
Hotopot	Back side	10	4183	836.6	24.5	24.27	5.44%	0.919	0.969	-
Hotspot	Back side	10	4233	846.6	24.5	24.10	9.65%	0.925	1.014	-
	Bottom side	10	4132	826.4	24.5	24.37	3.04%	0.17	0.175	-
	Right side	10	4132	826.4	24.5	24.37	3.04%	0.446	0.460	-
	Left side	10	4132	826.4	24.5	24.37	3.04%	0.616	0.635	-

<sup>\* -</sup> repeated at the highest SAR measurement according to the KDB865664D01v01r03

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Page: 81 of 319

### LTE FDD Band II

	D Ball	<u> </u>													
									Max. Rated	Measured		Averaged 1g (V	SAR over V/kg)		
Mode	Bandwidth (MHz)	Modulatior	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page	
					RE Cheek	-	19100	1900	24.5	24.35	3.51%	0.351	0.363	-	
					RE Tilt	-	19100	1900	24.5	24.35	3.51%	0.158	0.164	-	
			1 RB	99	LE Cheek	-	18700	1860	24.5	24.08	10.15%	0.328	0.361	-	
			I KD	99	LE Cheek	-	18900	1880	24.5	24.18	7.65%	0.374	0.403	-	
					LE Cheek	-	19100	1900	24.5	24.35	3.51%	0.453	0.469	135	
				LE Tilt	-	19100	1900	24.5	24.35	3.51%	0.15	0.155	-		
LTE Band 2	I 20MHz				RE Cheek	-	19100	1900	24	23.46	13.24%	0.284	0.322	-	
(Head)	ZUIVITZ		50 PR	50	RE Tilt	-	19100	1900	24	23.46	13.24%	0.131	0.148	-	
			50	50 RB	30	LE Cheek	-	19100	1900	24	23.46	13.24%	0.327	0.370	-
					LE Tilt	-	19100	1900	24	23.46	13.24%	0.121	0.137	-	
					RE Cheek	-	19100	1900	24	23.36	15.88%	0.271	0.314	-	
			100	) RB	RE Tilt	-	19100	1900	24	23.36	15.88%	0.128	0.148	-	
			100	/ KD	LE Cheek	-	19100	1900	24	23.36	15.88%	0.342	0.396	-	
					LE Tilt	-	19100	1900	24	23.36	15.88%	0.113	0.131	-	
					Front side	15mm	19100	1900	24.5	24.35	3.51%	0.476	0.493	-	
			1 RB	99	Back side	15mm	18700	1860	24.5	24.08	10.15%	0.638	0.703	-	
LTC Dand 2			I ND	77	Back side	15mm	18900	1880	24.5	24.18	7.65%	0.659	0.709	-	
LTE Band 2 (Body-	20MHz	QPSK			Back side	15mm	19100	1900	24.5	24.35	3.51%	0.743	0.769	136	
Worn)	ZOIVII IZ	QI JK	50 RB	50	Front side	15mm	19100	1900	24	23.46	13.24%	0.386	0.437	-	
1101117			JU ND	50	Back side	15mm	19100	1900	24	23.46	13.24%	0.583	0.660	-	
			100	) RB	Front side	15mm	19100	1900	24	23.36	15.88%	0.375	0.435	-	
			100	י ועט	Back side	15mm	19100	1900	24	23.36	15.88%	0.567	0.657	-	

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Page: 82 of 319

									Max. Rated	Measured			SAR over V/kg)			
Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page		
					Front side	10mm	18700	1860	24.5	24.08	10.15%	0.769	0.847	-		
					Front side	10mm	18900	1880	24.5	24.18	7.65%	0.821	0.884	-		
					Front side	10mm	19100	1900	24.5	24.35	3.51%	0.899	0.931	-		
					Back side	10mm	18700	1860	24.5		10.15%	1.18	1.300	-		
					Back side	10mm	18900	1880	24.5	24.18	7.65%	1.33	1.432	-		
					Back side	10mm	19100	1900	24.5	24.35	3.51%	1.32	1.366	-		
			1 DD	00	Bottom side	10mm	18700	1860	24.5	24.08	10.15%	1.13	1.245	-		
		1 RB	99	Bottom side	10mm	18900	1880	24.5	24.18	7.65%	1.21	1.303	-			
				Bottom side	10mm	19100	1900	24.5	24.35	3.51%	1.34	1.387	137			
				Bottom side*	10mm	19100	1900	24.5	24.35	3.51%	1.25	1.294	-			
					Bottom side- with headset	10mm	19100	1900	24.5	24.35	3.51%	1.29	1.335	-		
					Right side	10mm	19100	1900	24.5	24.35	3.51%	0.213	0.220	-		
					Left side	10mm	19100	1900	24.5	24.35	3.51%	0.227	0.235	-		
					Front side	10mm	18700	1860	24	23.15	21.62%	0.616	0.749	-		
					Front side	10mm	18900	1880	24	23.21	19.95%	0.661	0.793	-		
					Front side	10mm	19100	1900	24	23.46	13.24%	0.744	0.843	-		
LTE Band 2	20MHz	QPSK			21.62%	0.965	1.174	-								
(Hotspot)	ZUIVIITZ	QF3K			Back side	10mm	18900	1880	24	23.21	19.95%	1.03	1.235	-		
			50 RB	50	Back side	10mm	19100	1900	24	23.46	13.24%	1.09	1.234	-		
					Bottom side	10mm	18700	1860	24	23.15	21.62%	0.929	1.130	-		
					Bottom side	10mm	18900	1880	24	23.21	19.95%	0.989	1.186	-		
					Bottom side	10mm	19100	1900	24	23.46	13.24%	1.09	1.234	-		
					Right side	10mm	19100	1900	24	23.46	13.24%	0.171	0.194	-		
					Left side	10mm	19100	1900	24	23.46	13.24%	0.182	0.206	-		
					Front side	10mm	18700	1860	24	23.14	21.90%	0.614	0.748	-		
					Front side	10mm	18900	1880	24	23.16	21.34%	0.649	0.787	-		
					Front side	10mm	0mm         18700         1860         24         23.14         21.90           0mm         18900         1880         24         23.16         21.34	15.88%	0.72	0.834	-					
					Back side	10mm	18700	1860	24	23.14	21.90%	0.958	1.168	-		
							Back side	10mm	18900	1880	24	23.16	21.34%	1.01	1.226	-
			100	) RB	Back side	10mm	19100	1900	24	23.36	15.88%	1.07	1.240	-		
				Bottom side	10mm	18700	1860	24	23.14	21.90%	0.932	1.136	-			
					Bottom side	10mm	18900	1880	24	23.16	21.34%	0.972	1.179	-		
					Bottom side	10mm	19100	1900	24	23.36	15.88%	1.06	1.228	-		
					Right side	10mm	19100	1900	24	23.36	15.88%	0.172	0.199	-		
					Left side	10mm	19100	1900	24	23.36	15.88%	0.181	0.210	-		

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 83 of 319

### LTE FDD Band IV

	יום של														
									Max. Rated	Measured			SAR over V/kg)		
Mode	Bandwidth (MHz)	Modulatior	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page	
					RE Cheek	-	20050	1720	24.5	24.49	0.23%	0.451	0.452	-	
					RE Tilt	-	20050	1720	24.5	24.49	0.23%	0.182	0.182	-	
			1 RB	0	LE Cheek	-	20050	1720	24.5	24.49	0.23%	0.615	0.616	138	
			IKD	U	LE Cheek	-	20175	1732.5	24.5	24.47	0.69%	0.571	0.575	-	
			LE Cheek	-	20300	1745	24.5	24.48	0.46%	0.536	0.538	-			
				LE Tilt	-	20050	1720	24.5	24.49	0.23%	0.15	0.150	-		
LTE Band 4	LTE Band 4 20MHz QP	QPSK 50 RB			RE Cheek	-	20050	1720	24	23.65	8.39%	0.373	0.404	-	
(Head)	ZUIVITZ		_	EU DD	0	RE Tilt	-	20050	1720	24	23.65	8.39%	0.15	0.163	-
			50 RB	U	LE Cheek	-	20050	1720	24	23.65	8.39%	0.492	0.533	-	
					LE Tilt	-	20050	1720	24	23.65	8.39%	0.122	0.132	-	
					RE Cheek	-	20050	1720	24	23.58	10.15%	0.366	0.403	-	
			100	, DD	RE Tilt	-	20050	1720	24	23.58	10.15%	0.149	0.164	-	
			100	, KD	LE Cheek	-	20050	1720	24	23.58	10.15%	0.49	0.540	-	
					LE Tilt	-	20050	1720	24	23.58	10.15%	0.123	0.135	-	
					Front side	15mm	20050	1720	24.5	24.49	0.23%	0.617	0.618	-	
			1 RB	0	Back side	15mm	20050	1720	24.5	24.49	0.23%	0.679	0.681	139	
LTE Dond 4			I ND	U	Back side	15mm	20175	1732.5	24.5	24.47	0.69%	0.654	0.659	-	
	LTE Band 4 (Body- 20MHz QPSK Worn)	ODSK			Back side	15mm	20300	1745	24.5	24.48	0.46%	0.585	0.588	-	
Worn)		QF 3N	50 RB	0	Front side	15mm	20050	1720	24	23.65	8.39%	0.506	0.548	-	
***************************************			טא טט	0	Back side	15mm	20050	1720	24	23.65	8.39%	0.543	0.589	-	
			100	PR	Front side	15mm	20050	1720	24	23.58	10.15%	0.497	0.547	-	
			100	י ועט	Back side	15mm	20050	1720	24	23.58	10.15%	0.528	0.582	-	

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Page: 84 of 319

									Max. Rated	Measured		Averaged 1g (V	SAR over V/kg)		
Mode	Bandwidth (MHz)	Modulatior	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dRm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page	
					Front side	10mm	20050	1720	24.5	24.49	0.23%	1.08	1.082	-	
					Front side	10mm	20175	1732.5	24.5	24.47	0.69%	1.14	1.148	-	
					Front side	10mm	20300	1745	24.5	24.48	0.46%	0.957	0.961		
					Back side	10mm	20050	1720	24.5	24.49	0.23%	1.14	1.143		
					Back side	10mm	20175	1732.5	24.5	24.47	0.69%	1.18	1.188	-	
			1 RB	0	Back side	10mm	20300	1745	24.5	24.48	0.46%	1.07	1.075		
			IKD	U	Bottom side	10mm	20050	1720	24.5	24.49	0.23%	1.11	1.113	-	
				Bottom side	10mm	20175	1732.5	24.5	24.47	0.69%	1.2	1.208	140		
				Bottom side	10mm	20300	1745	24.5	24.48	0.46%	1.03	1.035	-		
				Bottom side*	10mm	20175	1732.5	24.5	24.47	0.69%	1.13	1.138	-		
				Right side	10mm	20050	1720	24.5	24.49	0.23%	0.392	0.393	-		
				Left side	10mm	20050	1720	24.5	24.49	0.23%	0.278	0.279	-		
					Front side	10mm	20050	1720	24	23.65	8.39%	0.887	0.961	-	
					Front side	10mm	20300	1745	24	23.55	10.92%	0.914	1.014	-	
					Back side	10mm	20050	1720	24	23.65	8.39%	0.934	1.012	-	
				0	Back side	10mm	20300	1745	24	23.55	10.92%	0.913	1.013	-	
LTE Band 4	20MHz	OPSK		U	Bottom side	10mm	20050	1720	24	23.65	8.39%	0.908	0.984	-	
(Hotspot)	ZUIVII IZ	QF3K	50 RB		Bottom side	10mm	20300	1745	24	23.55	10.92%	0.964	1.069	-	
							Right side	10mm	20050	1720	24	23.65	8.39%	0.326	0.353
					Left side	10mm	20050	1720	24	23.65	8.39%	0.218	0.236	-	
					Front side	10mm	20175	1732.5	24	23.54	11.17%	0.759	0.844	-	
				25	Back side	10mm	20175	1732.5	24	23.54	11.17%	0.81	0.901	-	
					Bottom side	10mm	20175	1732.5	24	23.54	11.17%	0.976	1.085	-	
					Front side	10mm	20050	1720	24	23.58	10.15%	0.874	0.963	-	
					Front side	10mm	20175	1732.5	24	23.51	11.94%	0.734	0.822	-	
					Front side	10mm	20300	1745	24	23.5	12.20%	0.797	0.894	-	
					Back side	10mm	20050	1720	24	23.58	10.15%	0.932	1.027	-	
					Back side	10mm	20175	1732.5	24	23.51	11.94%	0.935	1.047	-	
	1	100	) RB	Back side	10mm	20300	1745	24	23.5	12.20%	1.08	1.212	-		
				Bottom side	10mm	20050	1720	24	23.58	10.15%	0.905	0.997	-		
					Bottom side	10mm	20175	1732.5	24	23.51	11.94%	0.937	1.049	-	
					Bottom side	10mm	20300	1745	24	23.5	12.20%	0.982	1.102	-	
					Right side	10mm	20050	1720	24	23.58	10.15%	0.348	0.383	-	
					Left side	10mm	20050	1720	24	23.58	10.15%	0.204	0.225	-	

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 85 of 319

#### LTE FDD Band V

									Max. Rated	Measured			SAR over V/kg)	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
				49	RE Cheek	-	20525	836.5	24.5	24.38	2.80%	0.479	0.492	-
				49	RE Tilt	-	20525	836.5	24.5	24.38	2.80%	0.307	0.316	-
			1 RB	0	LE Cheek	-	20450	829	24.5	24.34	3.75%	0.501	0.520	-
			I KD	25	LE Cheek	-	20600	844	24.5	24.37	3.04%	0.549	0.566	-
				49	LE Cheek	-	20525	836.5	24.5	24.38	2.80%	0.581	0.597	141
	Band 5		49	LE Tilt	-	20525	836.5	24.5	24.38	2.80%	0.31	0.319	-	
LTE Band 5	TE Band 5 (Head) 10MHz QPS	ODCK			RE Cheek	-	20600	844	24	23.38	15.35%	0.396	0.457	-
(Head)		QF3K	25 RB	25	RE Tilt	-	20600	844	24	23.38	15.35%	0.255	0.294	-
			23 ND	25	LE Cheek	-	20600	844	24	23.38	15.35%	0.484	0.558	-
					LE Tilt	-	20600	844	24	23.38	15.35%	0.257	0.296	-
					RE Cheek	-	20525	836.5	24	23.4	14.82%	0.38	0.436	-
			50	RB	RE Tilt	-	20525	836.5	24	23.4	14.82%	0.275	0.316	-
			30	ΝD	LE Cheek	-	20525	836.5	24	23.4	14.82%	0.459	0.527	-
					LE Tilt	-	20525	836.5	24	23.4	14.82%	0.283	0.325	-
				49	Front side	15mm	20525	836.5	24.5	24.38	2.80%	0.496	0.510	-
			1 RB	0	Back side	15mm	20450	829	24.5	24.34	3.75%	0.502	0.521	-
LTE Band 5			I ND	25	Back side	15mm	20600	844	24.5	24.37	3.04%	0.506	0.521	142
(Body-	10MHz	QPSK		49	Back side	15mm	20525	836.5	24.5	24.38	2.80%	0.504	0.518	-
Worn)	TOWNIZ	QI JK	25 RB	25	Front side	15mm	20600	844	24	23.38	15.35%	0.407	0.469	-
1.5111)			23 ND	20	Back side	15mm	20600	844	24	23.38	15.35%	0.41	0.473	-
			50	RB	Front side	15mm	20525	836.5	24	23.4	14.82%	0.401	0.460	-
			50	טאו	Back side	15mm	20525	836.5	24	23.4	14.82%	0.407	0.467	-

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Page: 86 of 319

									Max. Rated	Measured			SAR over V/kg)	
Mode	Bandwidth (MHz)	Modulatior	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dRm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
				49	Front side	10mm	20525	836.5	24.5	24.38	2.80%	0.58	0.596	•
				0	Back side	10mm	20450	829	24.5	24.34	3.75%	0.832	0.863	•
				25	Back side	10mm	20600	844	24.5	24.37	3.04%	0.834	0.859	•
			1 RB	49	Back side	10mm	20525	836.5	24.5	24.38	2.80%	0.838	0.861	143
			IND	49	Back side*	10mm	20525	836.5	24.5	24.38	2.80%	0.836	0.859	-
				49	Bottom side	10mm	20525	836.5	24.5	24.38	2.80%	0.238	0.245	-
				49	Right side	10mm	20525	836.5	24.5	24.38	2.80%	0.591	0.608	-
				49	Left side	10mm	20525	836.5	24.5	24.38	2.80%	0.739	0.760	-
LTE Band 5	10MHz	QPSK			Front side	10mm	20600	844	24	23.38	15.35%	0.474	0.547	-
(Hotspot)	TOWINZ	QF3K			Back side	10mm	20600	844	24	23.38	15.35%	0.672	0.775	•
			25 RB	25	Bottom side	10mm	20600	844	24	23.38	15.35%	0.199	0.230	•
					Right side	10mm	20600	844	24	23.38	15.35%	0.487	0.562	-
					Left side	10mm	20600	844	24	23.38	15.35%	0.602	0.694	-
					Front side	10mm	20525	836.5	24	23.4	14.82%	0.472	0.542	-
					Back side	10mm	20525	836.5	24	23.4	14.82%	0.68	0.781	-
			50	RB	Bottom side	10mm	20525	836.5	24	23.4	14.82%	0.187	0.215	-
					Right side	10mm	20525	836.5	24	23.4	14.82%	0.473	0.543	-
					Left side	10mm	20525	836.5	24	23.4	14.82%	0.605	0.695	-

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 87 of 319

#### LTE FDD Band VII

LIEFL	D Da.		-											
									Max. Rated	Measured		Averaged SA (W/I	•	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
					RE Cheek	-	20850	2510	22.3	22.17	3.04%	0.183	0.189	-
					RE Cheek	-	21100	2535	22.3	22.24	1.39%	0.185	0.188	144
			1 RB	99	RE Cheek	-	21350	2560	22.3	22.27	0.69%	0.152	0.153	-
			I KD	99	RE Tilt	-	21350	2560	22.3	22.27	0.69%	0.046	0.046	-
					LE Cheek	-	21350	2560	22.3	22.27	0.69%	0.081	0.082	-
	E Band 7				LE Tilt	-	21350	2560	22.3	22.27	0.69%	0.045	0.045	-
LTE Band 7	TE Band 7 (Head) 20MHz	QPSK			RE Cheek	-	21350	2560	22	21.34	16.41%	0.122	0.142	-
(Head)		UPSK	50 RB	50	RE Tilt	-	21350	2560	22	21.34	16.41%	0.037	0.043	-
			30 KD	50	LE Cheek	-	21350	2560	22	21.34	16.41%	0.064	0.075	-
					LE Tilt	-	21350	2560	22	21.34	16.41%	0.036	0.042	-
					RE Cheek	-	21350	2560	22	21.29	17.76%	0.126	0.148	-
			100	RB	RE Tilt	-	21350	2560	22	21.29	17.76%	0.037	0.044	-
			100	יואט	LE Cheek	-	21350	2560	22	21.29	17.76%	0.063	0.074	-
					LE Tilt	-	21350	2560	22	21.29	17.76%	0.038	0.045	-
					Front side	15mm	21350	2560	22.3	22.27	0.69%	0.231	0.233	-
			1 RB	99	Back side	15mm	20850	2510	22.3	22.17	3.04%	0.462	0.476	-
LTE Band 7			ו ועט	//	Back side	15mm	21100	2535	22.3	22.24	1.39%	0.509	0.516	-
(Body-	20MHz	QPSK			Back side	15mm	21350	2560	22.3	22.27	0.69%	0.559	0.563	145
Worn)	ZOWINZ	QI JIN	50 RB	50	Front side	15mm	21350	2560	22	21.34	16.41%	0.189	0.220	-
,			30 10	00	Back side	15mm	21350	2560	22	21.34	16.41%	0.449	0.523	-
			100	RB	Front side	15mm	21350	2560	22	21.29	17.76%	0.185	0.218	-
			100	, IND	Back side	15mm	21350	2560	22	21.29	17.76%	0.443	0.522	-

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Page: 88 of 319

									Max. Rated	Measured		Averaged S/	U	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
					Front side	10mm	21350	2560	22.3	22.27	0.69%	0.407	0.410	-
					Back side	10mm	20850	2510	22.3	22.17	3.04%	0.954	0.983	-
					Back side	10mm	21100	2535	22.3	22.24	1.39%	1.02	1.034	-
					Back side	10mm	21350	2560	22.3	22.27	0.69%	1.13	1.138	146
			1 RB	99	Back side*	10mm	21350	2560	22.3	22.27	0.69%	1.13	1.138	-
			I KD	77	Bottom side	10mm	20850	2510	22.3	22.17	3.04%	0.8	0.824	-
					Bottom side	10mm	21100	2535	22.3	22.24	1.39%	0.883	0.895	-
				Bottom side	10mm	21350	2560	22.3	22.27	0.69%	0.974	0.981	-	
				Right side	10mm	21350	2560	22.3	22.27	0.69%	0.057	0.057	-	
				Left side	10mm	21350	2560	22.3	22.27	0.69%	0.057	0.057	-	
				Front side	10mm	21350	2560	22	21.34	16.41%	0.332	0.386	-	
					Back side	10mm	20850	2510	22	21.11	22.74%	0.751	0.922	-
					Back side	10mm	21100	2535	22	21.22	19.67%	0.841	1.006	-
LTE Band 7	20MHz	QPSK			Back side	10mm	21350	2560	22	21.34	16.41%	0.915	1.065	-
(Hotspot)	ZUIVITZ	UPSK	50 RB	50	Bottom side	10mm	20850	2510	22	21.11	22.74%	0.631	0.775	-
					Bottom side	10mm	21100	2535	22	21.22	19.67%	0.707	0.846	-
					Bottom side	10mm	21350	2560	22	21.34	16.41%	0.783	0.912	-
					Right side	10mm	21350	2560	22	21.34	16.41%	0.054	0.063	-
					Left side	10mm	21350	2560	22	21.34	16.41%	0.041	0.048	-
					Front side	10mm	21350	2560	22	21.29	17.76%	0.327	0.385	-
					Back side	10mm	20850	2510	22	21.04	24.74%	0.728	0.908	-
					Back side	10mm	21100	2535	22	21.18	20.78%	0.828	1.000	-
					Back side	10mm	21350	2560	22	21.29	17.76%	0.905	1.066	-
			100	) RB	Bottom side	10mm	20850	2510	22	21.04	24.74%	0.614	0.766	-
					Bottom side	10mm	21100	2535	22	21.18	20.78%	0.701	0.847	-
					Bottom side	10mm	21350	2560	22	21.29	17.76%	0.771	0.908	-
					Right side	10mm	21350	2560	22	21.29	17.76%	0.053	0.062	-
					Left side	10mm	21350	2560	22	21.29	17.76%	0.052	0.061	-

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 89 of 319

#### LTE FDD Band XII

	D Bai								Max. Rated	Measured		Averaged 1g (V	SAR over	
Mode	Bandwidth (MHz)	Modulatior	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured		Plot page
					RE Cheek	-	23090	707	24.5	24.48	0.46%	0.029	0.029	-
			1 RB	25	RE Tilt	-	23090	707	24.5	24.48	0.46%	0.019	0.019	-
			TIND	25	LE Cheek	-	23090	707	24.5	24.48	0.46%	0.043	0.043	147
					LE Tilt	-	23090	707	24.5	24.48	0.46%	0.024	0.024	-
					RE Cheek	-	23090	707	24	23.51	11.94%	0.021	0.024	-
LTE Band			25 RB	0	RE Tilt	-	23090	707	24	23.51	11.94%	0.013	0.015	-
12	10MHz	QPSK	20 ND		LE Cheek	-	23090	707	24	23.51	11.94%	0.032	0.036	-
(Head)	TOWNIE	QI SIX			LE Tilt	-	23090	707	24	23.51	11.94%	0.018	0.020	-
(******)					RE Cheek	-	23130	711	24	23.47	12.98%	0.027	0.031	-
					RE Tilt	-	23130	711	24	23.47	12.98%	0.019	0.021	-
			50	DB.	LE Cheek	-	23050	703	24	23.34	16.41%	0.026	0.030	-
			30	ND .	LE Cheek	-	23090	707	24	23.42	14.29%	0.042	0.048	-
					LE Cheek	-	23130	711	24	23.47	12.98%	0.042	0.047	-
		1 RB		LE Tilt	-	23130	711	24	23.47	12.98%	0.021	0.024	-	
		1 RR	25	Front side	15mm	23090	707	24.5	24.48	0.46%	0.037	0.037	-	
			1 110	20	Back side	15mm	23090	707	24.5	24.48	0.46%	0.055	0.055	-
LTE Band			25 RB	0	Front side	15mm	23090	707	24	23.51	11.94%	0.03	0.034	-
12	10MHz	QPSK	20 ND	Ů	Back side	15mm	23090	707	24	23.51	11.94%	0.046	0.051	-
(Body-	10111112	QI OIL		ļ	Front side	15mm	23130	711	24	23.47	12.98%	0.026	0.029	-
Worn)			50	RR	Back side	15mm	23050	703	24	23.34	16.41%	0.044	0.051	-
			30	ND .	Back side	15mm	23090	707	24	23.42	14.29%	0.073	0.083	148
					Back side	15mm	23130	711	24	23.47	12.98%	0.059	0.067	-
					Front side	10mm	23090	707	24.5	24.48	0.46%	0.04	0.040	-
					Back side	10mm	23090	707	24.5	24.48	0.46%	0.095	0.095	-
			1 RB	25	Bottom side	10mm	23090	707	24.5	24.48	0.46%	0.018	0.018	-
					Right side	10mm	23090	707	24.5	24.48	0.46%	0.024	0.024	-
					Left side	10mm	23090	707	24.5	24.48	0.46%	0.038	0.038	-
					Front side	10mm	23090	707	24	23.51	11.94%	0.03	0.034	-
					Back side	10mm	23090	707	24	23.51	11.94%	0.076	0.085	-
LTE Band			25 RB	0	Bottom side	10mm	23090	707	24	23.51	11.94%	0.014	0.016	-
12	10MHz	QPSK			Right side	10mm	23090	707	24	23.51	11.94%	0.018	0.020	-
(Hotspot)	(Hotspot)				Left side	10mm	23090	707	24	23.51	11.94%	0.02	0.022	-
1				ļ	Front side	10mm	23130	711	24	23.47	12.98%	0.035	0.040	-
1				ļ	Back side	10mm	23050	703	24	23.34	16.41%	0.069	0.080	-
					Back side	10mm	23090	707	24	23.42	14.29%	0.111	0.127	149
			50	RB	Back side	10mm	23130	711	24	23.47	12.98%	0.086	0.097	-
				ļ	Bottom side	10mm	23130	711	24	23.47	12.98%	0.016	0.018	-
				ļ	Right side	10mm	23130	711	24	23.47	12.98%	0.022	0.025	-
					Left side	10mm	23130	711	24	23.47	12.98%	0.034	0.038	-

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 90 of 319

#### LTE FDD Band XIII

	J		-											
Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power (dBm)	Scaling	1g (V	SAR over V/kg) Reported	Plot page
									Tolerance (dBm)	(ubiii)			·	
				25	RE Cheek	-	23230	782	24.5	24.44	1.39%	0.2	0.203	-
				25	RE Tilt	-	23230	782	24.5	24.44	1.39%	0.122	0.124	-
			4.00	0	LE Cheek	-	23230	782	24.5	24.31	4.47%	0.262	0.274	-
			1 RB	25	LE Cheek	-	23230	782	24.5	24.44	1.39%	0.243	0.246	-
				49	LE Cheek	-	23230	782	24.5	24.29	4.95%	0.274	0.288	150
LTC Dond				25	LE Tilt	-	23230	782	24.5	24.44	1.39%	0.156	0.158	-
LTE Band 13	10MHz	QPSK			RE Cheek	-	23230	782	24	23.43	14.02%	0.176	0.201	-
(Head)	TOWNIZ	QLSK	25 RB	12	RE Tilt	-	23230	782	24	23.43	14.02%	0.113	0.129	-
(riodd)			23 KD	12	LE Cheek	-	23230	782	24	23.43	14.02%	0.203	0.231	-
					LE Tilt	-	23230	782	24	23.43	14.02%	0.135	0.154	-
					RE Cheek	-	23230	782	24	23.48	12.72%	0.186	0.210	-
			50	RB	RE Tilt	-	23230	782	24	23.48	12.72%	0.119	0.134	-
			30	ΝD	LE Cheek	-	23230	782	24	23.48	12.72%	0.212	0.239	-
					LE Tilt	-	23230	782	24	23.48	12.72%	0.14	0.158	-
			25	Front side	15mm	23230	782	24.5	24.44	1.39%	0.27	0.274	-	
			1 RB	0	Back side	15mm	23230	782	24.5	24.31	4.47%	0.383	0.400	-
LTE Band			TILD	25	Back side	15mm	23230	782	24.5	24.44	1.39%	0.422	0.428	-
13	10MHz	QPSK		49	Back side	15mm	23230	782	24.5	24.29	4.95%	0.442	0.464	151
(Body-	10111112	QI OIL	25 RB	12	Front side	15mm	23230	782	24	23.43	14.02%	0.224	0.255	-
Worn)			20 110	'-	Back side	15mm	23230	782	24	23.43	14.02%	0.354	0.404	-
			50	RR	Front side	15mm	23230	782	24	23.48	12.72%	0.238	0.268	-
			00		Back side	15mm	23230	782	24	23.48	12.72%	0.353	0.398	-
				25	Front side	10mm	23230	782	24.5	24.44	1.39%	0.321	0.325	-
				0	Back side	10mm	23230	782	24.5	24.31	4.47%	0.529	0.553	-
				25	Back side	10mm	23230	782	24.5	24.44	1.39%	0.573	0.581	-
			1 RB	49	Back side	10mm	23230	782	24.5	24.29	4.95%	0.594	0.623	152
				25	Bottom side	10mm	23230	782	24.5	24.44	1.39%	0.087	0.088	-
				25	Right side	10mm	23230	782	24.5	24.44	1.39%	0.21	0.213	-
				25	Left side	10mm	23230	782	24.5	24.44	1.39%	0.396	0.402	-
LTE Band					Front side	10mm	23230	782	24	23.43	14.02%	0.259	0.295	-
13	10MHz	QPSK			Back side	10mm	23230	782	24	23.43	14.02%	0.474	0.540	-
(Hotspot)	(Hotspot)		25 RB	12	Bottom side	10mm	23230	782	24	23.43	14.02%	0.077	0.088	-
					Right side	10mm	23230	782	24	23.43	14.02%	0.155	0.177	-
					Left side	10mm	23230	782	24	23.43	14.02%	0.337	0.384	-
					Front side	10mm	23230	782	24	23.48	12.72%	0.259	0.292	-
			_		Back side	10mm	23230	782	24	23.48	12.72%	0.455	0.513	-
1			50	КВ	Bottom side	10mm	23230	782	24	23.48	12.72%	0.08	0.090	-
					Right side	10mm	23230	782	24	23.48	12.72%	0.163	0.184	-
					Left side	10mm	23230	782	24	23.48	12.72%	0.335	0.378	

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 91 of 319

#### LTE FDD Band XVII

	DO Bai	IG AV												
	Dand July					Distance		F	Max. Rated Avg.	Measured		Averaged 1g (V	SAR over V/kg)	Dist
Mode	Bandwidth (MHz)	Modulatior	RB Size	RB start	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
					RE Cheek	-	23780	709	24.5	24.49	0.23%	0.022	0.022	-
			1 RB	49	RE Tilt	-	23780	709	24.5	24.49	0.23%	0.019	0.019	-
			IKD	49	LE Cheek	-	23780	709	24.5	24.49	0.23%	0.03	0.030	-
					LE Tilt	-	23780	709	24.5	24.49	0.23%	0.02	0.020	-
					RE Cheek	-	23780	709	24	23.61	9.40%	0.025	0.027	-
LTE Band			25 RB	25	RE Tilt	-	23780	709	24	23.61	9.40%	0.023	0.025	-
17	10MHz	QPSK	23 KD	23	LE Cheek	-	23780	709	24	23.61	9.40%	0.035	0.038	-
(Head)	TOWNIZ	QISK			LE Tilt	-	23780	709	24	23.61	9.40%	0.02	0.022	-
(					RE Cheek	-	23790	710	24	23.64	8.64%	0.028	0.030	-
					RE Tilt	-	23790	710	24	23.64	8.64%	0.017	0.018	-
			50	RB	LE Cheek	-	23780	709	24	23.61	9.40%	0.034	0.037	-
			30	KD	LE Cheek	-	23790	710	24	23.64	8.64%	0.038	0.041	153
				LE Cheek	-	23800	711	24	23.56	10.66%	0.034	0.038	-	
					LE Tilt	-	23790	710	24	23.64	8.64%	0.02	0.022	-
		1 RB	49	Front side	15mm	23780	709	24.5	24.49	0.23%	0.027	0.027	-	
		TIND	17	Back side	15mm	23780	709	24.5	24.49	0.23%	0.056	0.056	-	
LTE Band			25 RB	25	Front side	15mm	23780	709	24	23.61	9.40%	0.03	0.033	-
17	10MHz	QPSK	20 10	20	Back side	15mm	23780	709	24	23.61	9.40%	0.059	0.065	154
(Body-	TOWNIZ	QISK			Front side	15mm	23790	710	24	23.64	8.64%	0.029	0.032	-
Worn)			50	RB	Back side	15mm	23780	709	24	23.61	9.40%	0.05	0.055	-
			30	KD	Back side	15mm	23790	710	24	23.64	8.64%	0.057	0.062	-
					Back side	15mm	23800	711	24	23.56	10.66%	0.055	0.061	-
					Front side	10mm	23780	709	24.5	24.49	0.23%	0.036	0.036	-
					Back side	10mm	23780	709	24.5	24.49	0.23%	0.089	0.089	155
					Back side	10mm	23790	710	24.5	24.46	0.93%	0.08	0.081	-
			1 RB	49	Back side	10mm	23800	711	24.5	24.46	0.93%	0.087	0.088	-
					Bottom side	10mm	23780	709	24.5	24.49	0.23%	0.01	0.010	-
					Right side	10mm	23780	709	24.5	24.49	0.23%	0.017	0.017	-
					Left side	10mm	23780	709	24.5	24.49	0.23%	0.024	0.024	-
LTE Band					Front side	10mm	23780	709	24	23.61	9.40%	0.04	0.044	-
17	10MHz	QPSK			Back side	10mm	23780	709	24	23.61	9.40%	0.084	0.092	-
(Hotspot)			25 RB	25	Bottom side	10mm	23780	709	24	23.61	9.40%	0.016	0.018	-
					Right side	10mm	23780	709	24	23.61	9.40%	0.024	0.026	-
					Left side	10mm	23780	709	24	23.61	9.40%	0.024	0.026	-
					Front side	10mm	23790	710	24	23.64	8.64%	0.03	0.033	-
					Back side	10mm	23790	710	24	23.64	8.64%	0.074	0.080	-
			50	RB	Bottom side	10mm	23790	710	24	23.64	8.64%	0.016	0.017	
					Right side	10mm	23790	710	24	23.64	8.64%	0.024	0.026	-
					Left side	10mm	23790	710	24	23.64	8.64%	0.034	0.037	

<sup>\* -</sup> repeated at the highest SAR measurement according to the FCC KDB865664D01v01r03

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Page: 92 of 319

### WLAN802.11 b

Mode	Position	Distance	СН	Freq. (MHz)	Max. Rated Avg.	Measured Avg.	Scaling	Averaged S (W/		Plot
		(mm)		(IVITZ)	Power + Max.	Power		Measured	Reported	page
	RE Cheek	-	1	2412	16.00	15.86	3.28%	0.391	0.404	-
	RE Cheek	-	6	2437	16.00	15.92	1.86%	0.375	0.382	-
Head	RE Cheek	-	11	2462	16.00	15.82	4.23%	0.587	0.612	156
пеаи	RE Tilt	-	6	2437	16.00	15.92	1.86%	0.239	0.243	-
	LE Cheek	-	6	2437	16.00	15.92	1.86%	0.161	0.164	-
	LE Tilt	-	6	2437	16.00	15.92	1.86%	0.126	0.128	-
	Front side	10	6	2437	16.00	15.92	1.86%	0.116	0.118	-
	Back side	10	1	2412	16.00	15.86	3.28%	0.392	0.405	-
Hotspot	Back side	10	6	2437	16.00	15.92	1.86%	0.333	0.339	-
потгрог	Back side	10	11	2462	16.00	15.82	4.23%	0.638	0.665	157
	Top side	10	6	2437	16.00	15.92	1.86%	0.062	0.063	-
	Left side	10	6	2437	16.00	15.92	1.86%	0.177	0.180	-

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Page: 93 of 319

### WLAN802.11 a 5.2G

Mode	Position	Distance	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling		SAR over 1g /kg)	Plot
		(mm)		(IVITZ)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	36	5180	14.00	13.99	0.23%	0.235	0.236	-
	RE Tilt	-	36	5180	14.00	13.99	0.23%	0.249	0.250	158
Head	RE Tilt	-	44	5220	14.00	13.74	6.17%	0.199	0.211	-
	LE Cheek	-	36	5180	14.00	13.99	0.23%	0.201	0.201	-
	LE Tilt	-	36	5180	14.00	13.99	0.23%	0.209	0.209	-
	Front side	15	36	5180	14.00	13.99	0.23%	0.040	0.040	-
Body- worn	Back side	15	36	5180	14.00	13.99	0.23%	0.341	0.342	159
Wolli	Back side	15	44	5220	14.00	13.74	6.17%	0.300	0.319	-

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Page: 94 of 319

### WLAN802.11 a 5.3G

Mode	Position	Distance	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling	Averaged S (W/	AR over 1g /kg)	Plot
		(mm)		(IVITZ)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	64	5320	14.00	13.99	0.23%	0.206	0.206	-
	RE Tilt	-	56	5280	14.00	13.88	2.80%	0.207	0.213	-
Head	RE Tilt	-	64	5320	14.00	13.99	0.23%	0.218	0.219	160
	LE Cheek	-	64	5320	14.00	13.99	0.23%	0.168	0.168	-
	LE Tilt	-	64	5320	14.00	13.99	0.23%	0.174	0.174	-
Darder	Front side	15	64	5320	14.00	13.99	0.23%	0.040	0.040	-
Body- worn	Back side	15	56	5280	14.00	13.88	2.80%	0.307	0.316	-
WOIII	Back side	15	64	5320	14.00	13.99	0.23%	0.319	0.320	161

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Page: 95 of 319

### WLAN802.11 a 5.6G

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling		SAR over 1g /kg)	Plot
		(111111)		(IVITZ)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	108	5540	14.00	13.89	2.57%	0.369	0.378	-
	RE Cheek	-	112	5560	14.00	13.87	3.04%	0.359	0.370	-
Head	RE Cheek	-	132	5660	14.00	13.98	0.46%	0.480	0.482	162
пеаи	RE Tilt	-	132	5660	14.00	13.98	0.46%	0.448	0.450	-
	LE Cheek	-	132	5660	14.00	13.98	0.46%	0.313	0.314	-
	LE Tilt	-	132	5660	14.00	13.98	0.46%	0.361	0.363	-
	Front side	15	132	5660	14.00	13.98	0.46%	0.080	0.080	-
Body-	Back side	15	108	5540	14.00	13.89	2.57%	0.360	0.369	-
worn	Back side	15	112	5560	14.00	13.87	3.04%	0.371	0.382	-
	Back side	15	132	5660	14.00	13.98	0.46%	0.382	0.384	163

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Page: 96 of 319

#### WLAN802.11 a 5.8G

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max.	Measured Avg. Power	Scaling		AR over 1g 'kg)	Plot
		(111111)		(IVII IZ)	Tolerance (dBm)	(dBm)		Measured	Reported	page
	RE Cheek	-	153	5765	14.00	13.87	3.04%	0.414	0.427	-
	RE Cheek	-	161	5805	14.00	13.84	3.75%	0.493	0.512	164
Head	RE Cheek	-	165	5825	14.00	13.81	4.47%	0.464	0.485	-
пеаи	RE Tilt	-	153	5765	14.00	13.87	3.04%	0.353	0.364	-
	LE Cheek	-	153	5765	14.00	13.87	3.04%	0.288	0.297	-
	LE Tilt	-	153	5765	14.00	13.87	3.04%	0.284	0.293	-
	Front side	15	153	5765	14.00	13.87	3.04%	0.059	0.061	-
Body-	Back side	15	153	5765	14.00	13.87	3.04%	0.298	0.307	-
worn	Back side	15	161	5805	14.00	13.84	3.75%	0.287	0.298	-
	Back side	15	165	5825	14.00	13.81	4.47%	0.298	0.311	165

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Page: 97 of 319

# 3. Simultaneous Transmission Analysis

#### **Simultaneous Transmission Scenarios:**

Simultaneous Transmit Configurations	Head	Body-Worn	Hotspot
GSM850/1900 + 2.4GHz Wi-Fi	Yes	No	No
GPRS850/1900 + 2.4GHz Wi-Fi	No	No	Yes
UMTS B2/4/5 + 2.4GHz Wi-Fi	Yes	No	Yes
LTE FDD B2/4/5/7/12/13/17 + 2.4GHz Wi-Fi	Yes	No	Yes
GSM850/1900 + 5GHz Wi-Fi	Yes	Yes	No
GPRS850/1900 + 5GHz Wi-Fi	No	No	No
UMTS B2/4/5 + 5GHz Wi-Fi	Yes	Yes	No
LTE FDD B2/4/5/7/12/13/17 + 5GHz Wi-Fi	Yes	Yes	No
GSM850/1900 + Bluetooth	No	Yes	No
GPRS850/1900 + Bluetooth	No	No	Yes
UMTS B2/4/5 + Bluetooth	No	Yes	Yes
LTE FDD B2/4/5/7/12/13/17 + Bluetooth	No	Yes	Yes

#### Notes:

- 1. GSM & WCDMA & LTE share the same antenna path and cannot transmit simultaneously
- 2. Bluetooth, 5GHz WiFi, and 2.4GHz WiFi share the same antenna path and cannot transmit simultaneously.

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Page: 98 of 319

#### 3.1 Estimated SAR calculation

According to KDB447498 D01v05 – When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

Estimated SAR = 
$$\frac{\text{Max.tune up power(mW)}}{\text{Min.test separation distance(mm)}} \times \frac{\sqrt{f(\text{GHz})}}{7.5}$$

If the minimum test separation distance is < 5mm, a distance of 5mm is used for estimated SAR calculation. When the test separation distance is >50mm, the 0.4W/kg is used for SAR-1g.

## 3.2 SPLSR evaluation and analysis

Per KDB447498D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR sum to peak location separation ratio(SPLSR).

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion.

The ratio is determined by (SAR1 + SAR2)^1.5/Ri, rounded to two decimal digits, and must be  $\leq 0.04$  for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and Ri is the separation distance between the peak SAR locations for the antenna pair in mm.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

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Page: 99 of 319

### **Simultaneous Transmission Combination**

	repo	rted SAR WW	AN and WLA	N DTS 2.4GI	-lz, ΣSAR eva	aluation	
Frequency	Do	osition	reported S	AR / W/kg	ΣSAR	Calculated	SPLSR
band	PC	JSILIUII	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.535	0.612	1.147	-	-
GSM 850	Head	RE tilt	0.312	0.243	0.555	-	=
G3IVI 636	Heau	LE cheek	0.66	0.164	0.824	-	-
		LE tilt	0.332	0.128	0.460	-	-
		Front	0.557	0.118	0.675	-	-
		Back	0.77	0.665	1.435	-	-
GPRS 850	Hotspot	Тор	-	0.063	-	-	-
(1Dn1UP)	Hotspot	Bottom	0.267	-	-	-	-
		Right	0.352	-	-	-	-
		Left	0.657	0.180	0.837	-	-
		RE cheek	0.213	0.612	0.825	-	-
GSM 1900	Head	RE tilt	0.057	0.243	0.300	-	-
G3W 1700	ricau	LE cheek	0.193	0.164	0.357	-	-
		LE tilt	0.059	0.128	0.187	-	-
		Front	0.511	0.118	0.629	-	-
		Back	0.601	0.665	1.266	-	-
GPRS 1900	Hotspot	Тор	-	0.063	-	-	-
(1Dn1UP)	Tiotspot	Bottom	0.726	-	-	-	-
		Right	0.132	-	-	-	-
		Left	0.103	0.180	0.283	-	-

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Page: 100 of 319

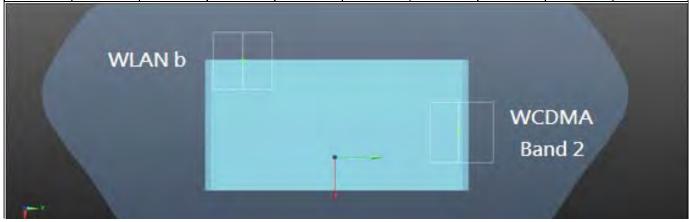
	repo	rted SAR WW	AN and WLA	N DTS 2.4G	Hz, ΣSAR eva	aluation	
Frequency	D	141	reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band	P	osition	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.36	0.612	0.972	-	-
	Hood	RE tilt	0.101	0.243	0.344	-	-
	Head	LE cheek	0.346	0.164	0.510	-	-
		LE tilt	0.102	0.128	0.230	-	-
WCDMA		Front	0.859	0.118	0.977	-	-
Band II		Back	1.279	0.665	1.944	116	0.023
	Hotspot	Тор	-	0.063	-	-	-
	Hotspot	Bottom	1.371	-	-	-	-
		Right	0.24	-	-	-	-
		Left	0.188	0.180	0.368	-	-
	Head	RE cheek	0.437	0.612	1.049	-	-
		RE tilt	0.166	0.243	0.409	-	-
		LE cheek	0.393	0.164	0.557	-	-
		LE tilt	0.12	0.128	0.248	-	-
WCDMA		Front	1.026	0.118	1.144	-	-
Band IV		Back	1.397	0.665	2.062	115.6	0.026
	Hotspot	Тор	-	0.063	-	-	-
	Hotspot	Bottom	1.221	-	-	-	-
		Right	0.25	-	-	-	-
		Left	0.217	0.180	0.397	-	-
		RE cheek	0.44	0.612	1.052	-	-
	Head	RE tilt	0.251	0.243	0.494	-	-
	пеаи	LE cheek	0.605	0.164	0.769	-	-
		LE tilt	0.264	0.128	0.392	-	-
WCDMA		Front	0.682	0.118	0.800	-	-
Band V		Back	1.014	0.665	1.679	108.9	0.020
	<b>.</b>	Тор	-	0.063	-	-	-
	Hotspot	Bottom	0.175	-	-	-	-
		Right	0.46	-	-	-	-
		Left	0.635	0.180	0.815	-	-

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Page: 101 of 319

			Co	oordinates (cr	n)		Peak		
Conditions	Position	SAR Value (W/kg)	х	у	Z	ΣSAR (W/kg)	Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
WCDMA B2 CH 9538	Back side	1.279	0.4	6.29	-0.06	1.944	116	0.023	SPLSR<0.04,
802.11b CH 11	DACK SIDE	0.665	-3.38	-4.68	-0.09	1.744	110	0.023	Not required



			Co	oordinates (cr	n)		Peak		
Conditions	Position	SAR Value (W/kg)	х	у	Z	ΣSAR (W/kg)	Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
WCDMA B4 CH 1513	Back side	1.397	0.7	6.14	-0.06	2.062	115.6	0.026	SPLSR<0.04,
802.11b CH 11	back side	0.665	-3.38	-4.68	-0.09	2.002	115.0	0.026	Not required
	W	ALN b					WCD Ban		

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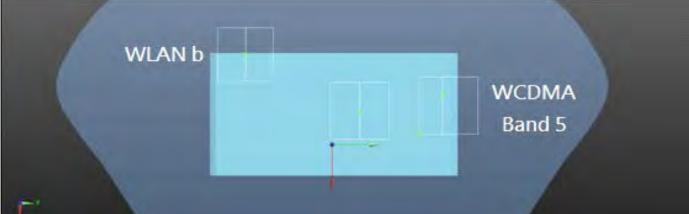
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Page: 102 of 319

			Co	oordinates (cr	n)		Peak		
Conditions	Position	SAR Value (W/kg)	х	у	Z	ΣSAR (W/kg)	Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
WCDMA B5 CH 4233	Back side	1.014	-1.14	5.98	-0.12	1.679	108.9	0.020	SPLSR<0.04,
802.11b CH 11	Dack Side	0.665	-3.38	-4.68	-0.09	1.079	100.9	0.020	Not required



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Page: 103 of 319

	repo	orted SAR WW	'AN and WLA	N DTS 2.4GI	Hz, ΣSAR ev	aluation	
Frequency	D	osition	reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band	PO	DSILION	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.363	0.612	0.975	-	-
	Llood	RE tilt	0.164	0.243	0.407	-	-
	Head	LE cheek	0.469	0.164	0.633	-	-
		LE tilt	0.155	0.128	0.283	-	-
LTE FDD		Front	0.931	0.118	1.049	-	-
Band 2		Back	1.432	0.665	2.097	121.6	0.025
	Hotspot	Тор	-	0.063	-	-	-
	потѕрот	Bottom	1.387	1	1	1	1
		Right	0.220	-	1	1	1
		Left	0.235	0.180	0.415	1	-
		RE cheek	0.452	0.612	1.064	-	-
	Head	RE tilt	0.182	0.243	0.425	-	-
		LE cheek	0.616	0.164	0.780	-	-
		LE tilt	0.15	0.128	0.278	1	-
LTE FDD		Front	1.148	0.118	1.266	-	-
Band 4		Back	1.212	0.665	1.877	111.8	0.023
	Hotspot	Тор	-	0.063	1	1	-
	потѕрот	Bottom	1.208	-	1	1	1
		Right	0.393	-	1	1	-
		Left	0.279	0.180	0.459	1	-
		RE cheek	0.492	0.612	1.104	1	-
	Head	RE tilt	0.316	0.243	0.559	-	-
	пеаи	LE cheek	0.597	0.164	0.761	ı	-
		LE tilt	0.325	0.128	0.453	-	-
LTE FDD		Front	0.596	0.118	0.714	-	-
Band 5		Back	0.863	0.665	1.528	-	-
	Hotspot	Тор	-	0.063	-	-	-
	Πυιδρυί	Bottom	0.245	-	-	-	-
		Right	0.608	-	-	-	-
		Left	0.76	0.180	0.940	-	-

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Page: 104 of 319

			С	oordinates (cr	n)		Peak		
Conditions	Position	SAR Value (W/kg)	х	у	Z	ΣSAR (W/kg)	Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
LTE Band 2 CH 18900	Back side	1.432	0.35	6.89	-0.06	2.097	121.6	0.025	SPLSR<0.04,
802.11b CH 11	Dack side	0.665	-3.38	-4.68	-0.09	2.071	121.0	0.023	Not required
7	CH 11  LTE  Band 2  WLAN b								

			C	oordinates (cr	n)		Peak		
Conditions	Position	SAR Value (W/kg)	X	у	Z	ΣSAR (W/kg)	Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
LTE Band 4 CH 20300	Back side	1.212	2.03	5.1	-0.03	1.877	111.8	0.023	SPLSR<0.04,
802.11b CH 11	Dack side	0.665	-3.38	-4.68	-0.09	1.077	111.0	0.023	Not required
<b>*</b>				LTE . Band 4		WLAI	N b		

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Page: 105 of 319

reported SAR WWAN and WLAN DTS 2.4GHz, ΣSAR evaluation  Frequency reported SAR / W/kg ΣSAR Calculated SPLS										
Frequency	D	osition	reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR			
band	P(	OSITION	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)			
		RE cheek	0.189	0.612	0.801	-	-			
	Llood	RE tilt	0.046	0.243	0.289	-	-			
	Head	LE cheek	0.082	0.164	0.246	-	-			
		LE tilt	0.045	0.128	0.173	-	-			
LTE FDD		Front	0.41	0.118	0.528	-	-			
Band 7		Back	1.138	0.665	1.803	113.8	0.021			
	Hotenot	Тор	-	0.063	-	-	-			
	Hotspot	Bottom	0.981	-	-	-	-			
		Right	0.063	-	-	-	-			
		Left	0.061	0.180	0.241	-	-			
		RE cheek	0.031	0.612	0.643	1	-			
	Head	RE tilt	0.021	0.243	0.264	-	-			
		LE cheek	0.048	0.164	0.212	1	ı			
		LE tilt	0.024	0.128	0.152	-	-			
LTE FDD		Front	0.04	0.118	0.158	1	-			
Band 12		Back	0.127	0.665	0.792	-	-			
	Hotopot	Тор	-	0.063	-	-	-			
	Hotspot	Bottom	0.018	-	-	-	-			
		Right	0.025	-	-	-	-			
		Left	0.038	0.180	0.218	-	-			
		RE cheek	0.197	0.612	0.809	-	-			
	Head	RE tilt	0.12	0.243	0.363	-	-			
	пеаи	LE cheek	0.261	0.164	0.425	-	-			
		LE tilt	0.154	0.128	0.282	-	-			
LTE FDD		Front	0.317	0.118	0.435	-	-			
Band 13		Back	0.566	0.665	1.231	-	-			
	Hotopot	Тор	-	0.063	-	-	-			
	Hotspot	Bottom	0.086	-	-	-	-			
		Right	0.207	-	-	-	-			
		Left	0.391	0.180	0.571	-	-			

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Page: 106 of 319

			C	oordinates (cr	n)		Peak		
Conditions	Position	SAR Value (W/kg)	х	у	Z	ΣSAR (W/kg)	Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
LTE Band 7 CH 21350	Back side	1.138	-0.4	6.3	-0.07	1.803	113.8	0.021	SPLSR<0.04,
802.11b CH 11	back side	0.665	-3.38	-4.68	-0.09	1.003	113.0	0.021	Not required



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Page: 107 of 319

	repo	orted SAR WW	AN and WLA	N DTS 2.4GI	Hz, ΣSAR ev	aluation	
Frequency	D,	osition	reported S	AR / W/kg	ΣSAR	Calculated	SPLSR
band	F	JSILIOII	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
	Head	RE cheek	0.03	0.612	0.642	-	-
		RE tilt	0.025	0.243	0.268	-	-
неа	пеаи	LE cheek	0.041	0.164	0.205	-	-
		LE tilt	0.022	0.128	0.150	1	-
LTE FDD		Front	0.044	0.118	0.162	1	-
Band 17		Back	0.092	0.665	0.757	-	-
	Hotspot	Тор	-	0.063	-	1	-
	Ποιδροί	Bottom	0.018	-	-	-	-
		Right	0.026	-	-	-	-
		Left	0.037	0.180	0.217	-	-

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Page: 108 of 319

reported SAR WWAN and WLAN DTS 5.8 GHz, ΣSAR evaluation							
Frequency	Position		reported SAR / W/kg		ΣSAR	Calculated	SPLSR
band			WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
GSM 850	Head	RE cheek	0.535	0.512	1.047	-	-
		RE tilt	0.312	0.364	0.676	-	-
		LE cheek	0.66	0.297	0.957	-	-
		LE tilt	0.332	0.293	0.625	-	-
	Body- Worn	Front	0.266	0.061	0.327	-	-
		Back	0.418	0.311	0.729	-	-
GSM 1900	Head	RE cheek	0.213	0.512	0.725	-	-
		RE tilt	0.057	0.364	0.421	-	-
		LE cheek	0.193	0.297	0.49	-	-
		LE tilt	0.059	0.293	0.352	-	-
	Body- Worn	Front	0.315	0.061	0.376	-	-
		Back	0.369	0.311	0.68	-	-
WCDMA Band II	Head	RE cheek	0.36	0.512	0.872	-	-
		RE tilt	0.101	0.364	0.465	-	-
		LE cheek	0.346	0.297	0.643	-	-
		LE tilt	0.102	0.293	0.395	-	-
	Body- Worn	Front	0.576	0.061	0.637	-	-
		Back	0.495	0.311	0.806	-	-
WCDMA Band IV	Head	RE cheek	0.437	0.512	0.949	-	-
		RE tilt	0.166	0.364	0.53	-	-
		LE cheek	0.393	0.297	0.69	-	-
		LE tilt	0.12	0.293	0.413	-	-
	Body- Worn	Front	0.6	0.061	0.661	-	-
		Back	0.57	0.311	0.881	-	-

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Page: 109 of 319

	reported	SAR WWAI	N and WLAN	N DTS 5.8 G	Hz, ΣSAR e	valuation	
Frequency	D	111	reported SAR / W/kg		ΣSAR	Calculated	SPLSR
band	Position		WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.44	0.512	0.952	-	-
	Head	RE tilt	0.251	0.364	0.615	-	-
WCDMA	Heau	LE cheek	0.605	0.297	0.902	-	-
Band V		LE tilt	0.264	0.293	0.557	-	-
	Body-	Front	0.279	0.061	0.34	-	-
	Worn	Back	0.47	0.311	0.781	-	-
		RE cheek	0.363	0.512	0.875	-	-
	Head LTE FDD	RE tilt	0.164	0.364	0.528	-	-
LTE FDD Band 2		LE cheek	0.469	0.297	0.766	-	-
		LE tilt	0.155	0.293	0.448	-	-
	Body-	Front	0.493	0.061	0.554	-	-
	Worn	Back	0.769	0.311	1.08	-	-
		RE cheek	0.452	0.512	0.964	-	-
	Head	RE tilt	0.182	0.364	0.546	-	-
LTE FDD	пеаи	LE cheek	0.616	0.297	0.913	-	-
Band 4		LE tilt	0.15	0.293	0.443	-	-
	Body-	Front	0.618	0.061	0.679	-	-
	Worn	Back	0.681	0.311	0.992	-	-
		RE cheek	0.492	0.512	1.004	-	-
	Head	RE tilt	0.316	0.364	0.68	-	-
LTE FDD	пеаи	LE cheek	0.597	0.297	0.894	-	
Band 5		LE tilt	0.325	0.293	0.618	-	-
	Body-	Front	0.51	0.061	0.571		
	Worn	Back	0.521	0.311	0.832	-	-

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Page: 110 of 319

	reported	SAR WWAI	N and WLAN	N DTS 5.8 G	Hz, ΣSAR e	valuation	
Frequency	D.	111	reported SAR / W/kg		ΣSAR	Calculated	SPLSR
band	Position		WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.189	0.512	0.701	-	-
	Head	RE tilt	0.046	0.364	0.41	-	-
LTE FDD	Heau	LE cheek	0.082	0.297	0.379	-	-
Band 7		LE tilt	0.045	0.293	0.338	-	-
	Body-	Front	0.233	0.061	0.294	-	-
	Worn	Back	0.563	0.311	0.874	-	-
		RE cheek	0.031	0.512	0.543	-	-
LTE FDD Band 12	RE tilt	0.021	0.364	0.385	-	-	
	Heau	LE cheek	0.048	0.297	0.345	=	=
		LE tilt	0.024	0.293	0.317	-	-
	Body-	Front	0.037	0.061	0.098	-	-
	Worn	Back	0.083	0.311	0.394	=	=
		RE cheek	0.197	0.512	0.709	-	-
	Head	RE tilt	0.12	0.364	0.484	-	-
LTE FDD	Heau	LE cheek	0.261	0.297	0.558	-	-
Band 13		LE tilt	0.154	0.293	0.447	-	-
	Body-	Front	0.266	0.061	0.327	-	-
	Worn	Back	0.421	0.311	0.732	-	-
		RE cheek	0.03	0.512	0.542	-	-
	Head	RE tilt	0.025	0.364	0.389	-	-
LTE FDD	Heau	LE cheek	0.041	0.297	0.338	-	-
Band 17		LE tilt	0.022	0.293	0.315	-	-
[	Body-	Front	0.033	0.061	0.094	-	-
	Worn	Back	0.065	0.311	0.376	-	-

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SGS Taiwan Ltd.



Page: 111 of 319

	reporte	ed SAR WWA	AN and WLA	N DTS 5 GH	łz, ΣSAR ev	aluation	
Frequency			reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band		ition	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.535	0.482	1.017	1	-
	Head	RE tilt	0.312	0.45	0.762	1	-
GSM 850	пеаи	LE cheek	0.66	0.314	0.974	1	-
G31VI 63U		LE tilt	0.332	0.363	0.695	1	-
	Body-	Front	0.266	0.08	0.346	1	-
	Worn	Back	0.418	0.384	0.802	1	-
GSM 1900  Body-		RE cheek	0.213	0.482	0.695	1	-
	RE tilt	0.057	0.45	0.507	1	-	
	Head	LE cheek	0.193	0.314	0.507	-	-
		LE tilt	0.059	0.363	0.422	1	-
	Body-	Front	0.315	0.08	0.395	1	-
	Worn	Back	0.369	0.384	0.753	1	-
		RE cheek	0.36	0.482	0.842	1	-
	Head	RE tilt	0.101	0.45	0.551	1	-
WCDMA	пеаи	LE cheek	0.346	0.314	0.66	1	-
Band II		LE tilt	0.102	0.363	0.465	1	-
	Body-	Front	0.576	0.08	0.656	-	-
	Worn	Back	0.495	0.384	0.879	-	-
		RE cheek	0.437	0.482	0.919	-	-
		RE tilt	0.166	0.45	0.616	-	-
WCDMA	Head	LE cheek	0.393	0.314	0.707	-	-
Band IV		LE tilt	0.12	0.363	0.483	-	-
	Body-	Front	0.6	0.08	0.68	-	-
_	Worn	Back	0.57	0.384	0.954	1	-

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Page: 112 of 319

	reporte	d SAR WWA	AN and WLA	N DTS 5 GH	lz, ΣSAR ev	aluation	
Frequency	5	.,.	reported SAR / W/k		ΣSAR	Calculated	SPLSR
band	Pos	ition	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.44	0.482	0.922	-	-
	Head	RE tilt	0.251	0.45	0.701	-	i
WCDMA	Heau	LE cheek	0.605	0.314	0.919	-	-
Band V		LE tilt	0.264	0.363	0.627	-	-
	Body-	Front	0.279	0.08	0.359	-	-
	Worn	Back	0.47	0.384	0.854	-	ı
		RE cheek	0.363	0.482	0.845	-	ı
LTE FDD Band 2 Body-	RE tilt	0.164	0.45	0.614	-	ı	
	пеаи	LE cheek	0.469	0.314	0.783	-	-
		LE tilt	0.155	0.363	0.518	-	ı
	Body-	Front	0.493	0.08	0.573	-	-
	Worn	Back	0.769	0.384	1.153	-	i
		RE cheek	0.452	0.482	0.934	-	ı
	Head	RE tilt	0.182	0.45	0.632	-	-
LTE FDD	пеаи	LE cheek	0.616	0.314	0.93	-	-
Band 4		LE tilt	0.15	0.363	0.513	-	-
	Body-	Front	0.618	0.08	0.698	-	-
	Worn	Back	0.681	0.384	1.065	-	ı
		RE cheek	0.492	0.482	0.974	-	-
	Head	RE tilt	0.316	0.45	0.766	-	-
LTE FDD	пеаи	LE cheek	0.597	0.314	0.911		
Band 5		LE tilt	0.325	0.363	0.688	-	-
	Body-	Front	0.51	0.08	0.59	-	-
	Worn	Back	0.521	0.384	0.905	-	-

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SGS Taiwan Ltd.



Page: 113 of 319

	reporte	d SAR WWA	N and WLA	N DTS 5 GH	łz, ΣSAR ev	aluation	
Frequency	<b>D</b>	.,.	reported SAR / W/kg		ΣSAR	Calculated	SPLSR
band	Pos	ition	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.189	0.482	0.671	-	-
	Head	RE tilt	0.046	0.45	0.496	-	-
LTE FDD	Heau	LE cheek	0.082	0.314	0.396	-	-
Band 7		LE tilt	0.045	0.363	0.408	-	-
	Body-	Front	0.233	0.08	0.313	-	-
	Worn	Back	0.563	0.384	0.947	-	1
		RE cheek	0.031	0.482	0.513	-	-
	LTE FDD Head	RE tilt	0.021	0.45	0.471	-	-
LTE FDD		LE cheek	0.048	0.314	0.362	-	-
Band 12		LE tilt	0.024	0.363	0.387	-	-
	Body-	Front	0.037	0.08	0.117	-	=
	Worn	Back	0.083	0.384	0.467	-	-
		RE cheek	0.197	0.482	0.679	-	-
	Head	RE tilt	0.12	0.45	0.57	-	=
LTE FDD	Heau	LE cheek	0.261	0.314	0.575	-	-
Band 13		LE tilt	0.154	0.363	0.517	-	1
	Body-	Front	0.266	0.08	0.346	-	=
	Worn	Back	0.421	0.384	0.805	-	1
		RE cheek	0.03	0.482	0.512	-	=
	Head	RE tilt	0.025	0.45	0.475	-	-
LTE FDD	неаа	LE cheek	0.041	0.314	0.355	-	-
Band 17		LE tilt	0.022	0.363	0.385	-	-
	Body-	Front	0.033	0.08	0.113	-	=
	Worn	Back	0.065	0.384	0.449	-	-

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Page: 114 of 319

	rep	orted SAR V	WWAN and	Bluetooth, Σ	SAR evalua	tion	
Frequency			reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band	Posi	ition	WWAN	Bluetooth	<1.6W/kg	distance (mm)	(≦0.04)
GSM 850 Body-	Front	0.266	0.048	0.314	-	-	
G3W 630	Worn	Back	0.418	0.048	0.466	-	-
		Front	0.557	0.072	0.629	-	-
		Back	0.77	0.072	0.842	-	-
GPRS 850	Hotspot	Top	-	0.072	-	-	-
(1Dn1UP)	πυιδρυι	Bottom	0.267	0.072	0.339	-	-
		Right	0.352	0.072	0.424	-	-
		Left	0.657	0.072	0.729	-	-
GSM 1900	Body-	Front	0.315	0.048	0.363	-	-
G3W 1900	Worn	Back	0.369	0.048	0.417	-	-
		Front	0.511	0.072	0.583	-	-
CDDC		Back	0.601	0.072	0.673	-	-
GPRS 1900	Hotspot	Тор	-	0.072	-	-	-
(1Dn1UP)	πυιδρυι	Bottom	0.726	0.072	0.798	-	-
		Right	0.132	0.072	0.204	-	-
		Left	0.103	0.072	0.175	-	-
	Body-	Front	0.576	0.048	0.624	-	-
	Worn	Back	0.495	0.048	0.543	-	-
		Front	0.859	0.072	0.931	-	-
WCDMA		Back	1.279	0.072	1.351	-	-
Band II	Hotspot	Тор	-	0.072	-	-	-
		Bottom	1.371	0.072	1.443	-	-
		Right	0.24	0.072	0.312	-	-
		Left	0.188	0.072	0.26	-	-

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Page: 115 of 319

	rep	orted SAR \	WWAN and	Bluetooth, Σ	SAR evalua	tion	
Frequency			reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band		ition	WWAN	Bluetooth	<1.6W/kg	distance (mm)	(≦0.04)
	Body-	Front	0.6	0.048	0.648	-	-
	Worn	Back	0.57	0.048	0.618	-	-
		Front	1.026	0.072	1.098	-	-
WCDMA		Back	1.397	0.072	1.469	-	1
Band IV	Untenat	Тор	-	0.072	-	-	-
	Hotspot	Bottom	1.221	0.072	1.293	-	-
		Right	0.25	0.072	0.322	-	-
		Left	0.217	0.072	0.289	-	-
	Body-	Front	0.279	0.048	0.327	-	-
	Worn	Back	0.47	0.048	0.518	-	-
		Front	0.682	0.072	0.754	-	-
WCDMA		Back	1.014	0.072	1.086	-	-
Band V	Hotspot	Тор	-	0.072	-	-	-
		Bottom	0.175	0.072	0.247	-	-
		Right	0.46	0.072	0.532	-	-
		Left	0.635	0.072	0.707	-	-
	Body-	Front	0.493	0.048	0.541	-	-
	Worn	Back	0.769	0.048	0.817	-	-
		Front	0.931	0.072	1.003	-	-
LTE FDD		Back	1.432	0.072	1.504	-	-
Band 2	Untenat	Тор	-	0.072	-	-	-
	Hotspot	Bottom	1.387	0.072	1.459	-	-
		Right	0.220	0.072	0.292	-	-
		Left	0.235	0.072	0.307	-	-

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Page: 116 of 319

	reported SAR WWAN and Bluetooth, ΣSAR evaluation									
Frequency			reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR			
band	Pos	ition	WWAN	Bluetooth	<1.6W/kg	distance (mm)	(≦0.04)			
	Body-	Front	0.618	0.048	0.666	-	-			
	Worn	Back	0.681	0.048	0.729	-	-			
		Front	1.148	0.072	1.22	-	-			
LTE FDD		Back	1.212	0.072	1.284	-	-			
Band 4	Hotopot	Тор	-	0.072	-	-	-			
	Hotspot	Bottom	1.208	0.072	1.28	-	-			
		Right	0.393	0.072	0.465	-	-			
		Left	0.279	0.072	0.351	-	-			
	Body-	Front	0.51	0.048	0.558	-	-			
	Worn	Back	0.521	0.048	0.569	-	-			
		Front	0.596	0.072	0.668	-	-			
LTE FDD		Back	0.863	0.072	0.935	-	-			
Band 5	Hotspot	Тор	-	0.072	-	-	-			
		Bottom	0.245	0.072	0.317	-	-			
		Right	0.608	0.072	0.68	-	-			
		Left	0.76	0.072	0.832	-	-			
	Body-	Front	0.233	0.048	0.281	-	-			
	Worn	Back	0.563	0.048	0.611	-	-			
		Front	0.41	0.072	0.482	-	-			
LTE FDD		Back	1.138	0.072	1.21	-	-			
Band 7	Hotspot	Тор	-	0.072	-	-	-			
		Bottom	0.981	0.072	1.053	-	-			
		Right	0.063	0.072	0.135	-	-			
		Left	0.061	0.072	0.133	-	-			

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Page: 117 of 319

	rep	orted SAR V	WWAN and	Bluetooth, Σ	SAR evalua	tion	
Frequency	_		reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band	Pos	ition	WWAN	Bluetooth	<1.6W/kg	distance (mm)	(≦0.04)
	Body-	Front	0.037	0.048	0.085	-	-
	Worn	Back	0.083	0.048	0.131	-	-
		Front	0.04	0.072	0.112	-	-
LTE FDD		Back	0.127	0.072	0.199	-	-
Band 12	Hotspot	Тор	-	0.072	-	-	-
	Посърос	Bottom	0.018	0.072	0.09	-	-
		Right	0.025	0.072	0.097	-	-
		Left	0.038	0.072	0.11	-	-
	Body-	Front	0.266	0.048	0.314	-	-
	Worn	Back	0.421	0.048	0.469	-	-
		Front	0.317	0.072	0.389	-	-
LTE FDD		Back	0.566	0.072	0.638	-	-
Band 13	Hotspot	Тор	-	0.072	-	-	-
		Bottom	0.086	0.072	0.158	-	-
		Right	0.207	0.072	0.279	-	-
		Left	0.391	0.072	0.463	-	-
	Body-	Front	0.033	0.048	0.081	-	-
	Worn	Back	0.065	0.048	0.113	-	-
		Front	0.044	0.072	0.116	-	-
LTE FDD		Back	0.092	0.072	0.164	-	-
Band 17	Hotspot	Тор	-	0.072	-	-	-
	πυιδρυι	Bottom	0.018	0.072	0.09	-	-
		Right	0.026	0.072	0.098	-	-
		Left	0.037	0.072	0.109	-	-

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Page: 118 of 319

# 4. Instruments List

Device	Manufacturer	Туре	Serial	Date of last	Date of next
Device	Manufacturei	туре	number	calibration	calibration
			3923	Aug.28,2014	Aug.27,2015
Dosimetric E-Field	Schmid & Partner Engineering AG	EX3DV4	3831	Jan.31,2014	Jan.30,2015
Probe		EX3DV4	3938	Jul.25,2014	Jul.24,2015
			3770	Apr.24,2014	Apr.23,2015
		D750V2	1015	Aug.28,2014	Aug.27,2015
		D835V2	4d063	Aug.28,2014	Aug.27,2015
Contract Wallstaller	Calcada O Dantana	D1750V2	1008	Aug.28,2014	Aug.27,2015
System Validation Dipole	Schmid & Partner Engineering AG	D1900V2	5d027	Apr.23,2014	Apr.22,2015
Біроїс	Linginicaning 7.0	D2450V2	727	Apr.23,2014	Apr.22,2015
		D2600V2	1005	Jan.28,2014	Jan.27,2015
		D5GHzV2	1104	Apr.16,2014	Apr. 15, 2015
	Schmid & Partner Engineering AG	DAE4	1260	Aug.26,2014	Aug.25,2015
Data acquisition			915	Jun.18,2014	Jun.17,2015
Electronics			856	Aug.27,2014	Aug.26,2015
		DAE3	360	Feb.17,2014	Feb.16,2015
Software	Schmid & Partner	DASY 52	N/A	Calibration	Calibration
Software	Engineering AG	V52.8.8	IN/A	not required	not required
Phantom	Schmid & Partner	SAM	N/A	Calibration	Calibration
rnantom	Engineering AG	SAIVI	IN/ A	not required	not required
Network Analyzer	Agilent	E5071C	MY46107530	Feb.14,2014	Feb.13,2015
Dielectric Probe Kit	Agilent	85070E	MY44300677	Calibration	Calibration
Diciectific Frode Kit	Agnorit	03070L	101144300077	not required	not required
Dual-directional	Agilent	772D	MY46151242	Jul.14,2014	Jul.13,2015
coupler	7 ignorit	778D	MY48220468	Apr.01,2014	Mar.31,2015
RF Signal Generator	Agilent	N5181A	MY50141235	Dec.14,2013	Dec.13,2016
Agilent	Power Meter	E4417A	MY52240003	Apr.30,2014	Apr.29,2015

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Page: 119 of 319

Device	Manufacturer	Туре	Serial number	Date of last calibration	Date of next calibration
Agilent	Power Sensor	E9301H	MY52200004	Apr.30,2014	Apr.29,2015
Radio Communication Test	R&S	CMU200	122498	Aug.14,2014	Aug.13,2015
Radio Communication Test	Anritsu	MT8820C	6201061014	Aug.06,2014	Aug.05,2015
TECPEL	Digital thermometer	DTM-303A	TP130074	Mar.20,2014	Mar.19,2015

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Page: 120 of 319

#### 5. Measurements

Date: 2014/11/16

#### GSM 850\_Head\_Le Cheek\_CH 190

Communication System: GSM; Frequency: 836.6 MHz, Duty factor: 1:8.3

Medium parameters used: f = 837 MHz;  $\sigma = 0.885 \text{ S/m}$ ;  $\varepsilon_r = 41.14$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(9.14, 9.14, 9.14); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head:

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/Head/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.693 W/kg

## Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

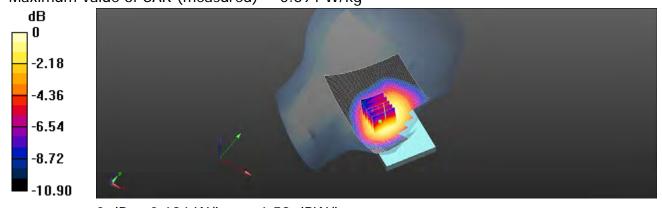
dy=8mm, dz=5mm

Reference Value = 6.239 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.768 W/kg

#### SAR(1 g) = 0.602 W/kg; SAR(10 g) = 0.440 W/kg

Maximum value of SAR (measured) = 0.694 W/kg



0 dB = 0.694 W/kq = -1.59 dBW/kq

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Page: 121 of 319

Date: 2014/11/16

#### GSM 850\_Speech mode\_Back side\_CH 251\_15mm

Communication System: GSM; Frequency: 848.8 MHz, Duty factor: 1:8.3

Medium parameters used: f = 849 MHz;  $\sigma = 1.027$  S/m;  $\varepsilon_r = 52.766$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(9.03, 9.03, 9.03); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.467 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

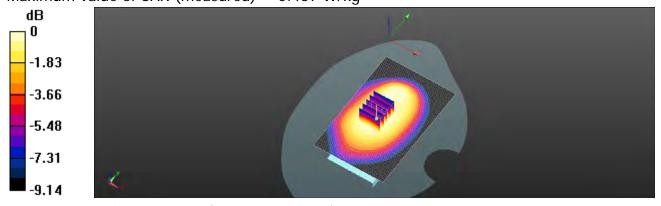
dy=8mm, dz=5mm

Reference Value = 20.95 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.517 W/kg

#### SAR(1 g) = 0.399 W/kg; SAR(10 g) = 0.295 W/kg

Maximum value of SAR (measured) = 0.467 W/kg



0 dB = 0.467 W/kq = -3.31 dBW/kq

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Page: 122 of 319

Date: 2014/11/16

## GPRS 850\_Hotspot\_Back side\_CH 190\_10mm

Communication System: GPRS (1Dn1Up); Frequency: 836.6 MHz, Duty factor: 1:8.3 Medium parameters used: f = 837 MHz;  $\sigma = 1.015 \text{ S/m}$ ;  $\epsilon_r = 52.87$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN3831; ConvF(9.03, 9.03, 9.03); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 0.825 W/kg

# Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 27.83 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.902 W/kg

SAR(1 g) = 0.702 W/kg; SAR(10 g) = 0.520 W/kg

Maximum value of SAR (measured) = 0.819 W/kg

# Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 27.83 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.933 W/kg

#### SAR(1 g) = 0.588 W/kg; SAR(10 g) = 0.398 W/kg

Maximum value of SAR (measured) = 0.769 W/kg

# Configuration/Body/Zoom Scan (5x5x7)/Cube 2: Measurement grid: dx=8mm,

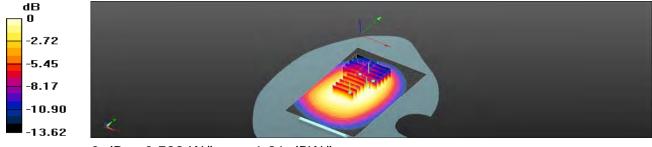
dy=8mm, dz=5mm

Reference Value = 27.83 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.875 W/kg

## SAR(1 g) = 0.573 W/kg; SAR(10 g) = 0.393 W/kg

Maximum value of SAR (measured) = 0.739 W/kg



0 dB = 0.739 W/kq = -1.31 dBW/kq

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Page: 123 of 319

Date: 2014/11/18

#### GSM 1900\_Head\_Re Cheek\_CH 810

Communication System: GSM; Frequency: 1909.8 MHz, Duty factor: 1:8.3

Medium parameters used: f = 1910 MHz;  $\sigma = 1.389 \text{ S/m}$ ;  $\epsilon_r = 39.304$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(7.79, 7.79, 7.79); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Head/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.254 W/kg

## Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

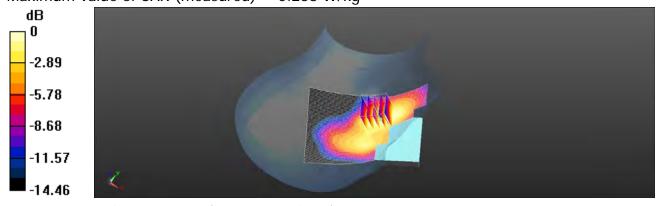
dy=8mm, dz=5mm

Reference Value = 3.897 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.298 W/kg

#### SAR(1 g) = 0.194 W/kg; SAR(10 g) = 0.123 W/kg

Maximum value of SAR (measured) = 0.238 W/kg



0 dB = 0.238 W/kq = -6.23 dBW/kq

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Page: 124 of 319

Date: 2014/11/18

## GSM 1900\_Speech mode\_Back side\_CH 810\_15mm

Communication System: GSM; Frequency: 1909.8 MHz, Duty factor: 1:8.3

Medium parameters used: f = 1910 MHz;  $\sigma = 1.504 \text{ S/m}$ ;  $\epsilon_r = 51.909$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.19, 7.19, 7.19); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.420 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

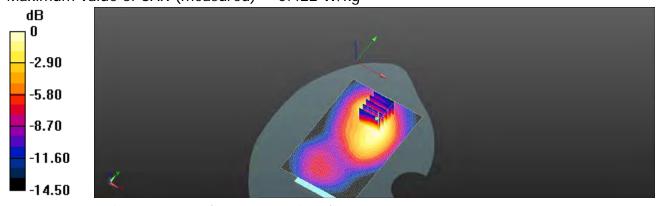
dy=8mm, dz=5mm

Reference Value = 7.268 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.511 W/kg

#### SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.199 W/kg

Maximum value of SAR (measured) = 0.422 W/kg



0 dB = 0.422 W/kg = -3.75 dBW/kg

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Page: 125 of 319

Date: 2014/11/18

## GPRS 1900\_Hotspot\_Bottom side\_CH 810\_10mm

Communication System: GPRS (1Dn1Up); Frequency: 1909.8 MHz, Duty factor: 1:8.3 Medium parameters used: f=1910 MHz;  $\sigma=1.504$  S/m;  $\epsilon_r=51.909$ ;  $\rho=1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(7.19, 7.19, 7.19); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (41x61x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.888 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

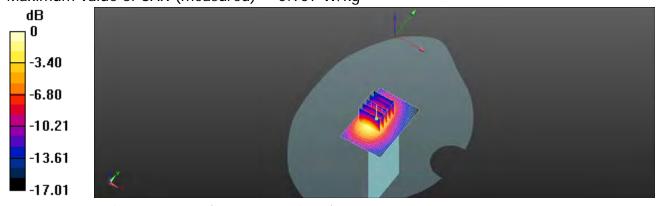
dy=8mm, dz=5mm

Reference Value = 15.70 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.09 W/kg

#### SAR(1 g) = 0.662 W/kg; SAR(10 g) = 0.362 W/kg

Maximum value of SAR (measured) = 0.907 W/kg



0 dB = 0.907 W/kq = -0.42 dBW/kq

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Page: 126 of 319

Date: 2014/11/18

#### WCDMA Band II\_Head\_Re Cheek\_CH 9538

Communication System: WCDMA; Frequency: 1907.6 MHz, Duty factor: 1:1

Medium parameters used: f = 1908 MHz;  $\sigma = 1.388$  S/m;  $\epsilon_r = 39.314$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.79, 7.79, 7.79); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Head/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.460 W/kg

## Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

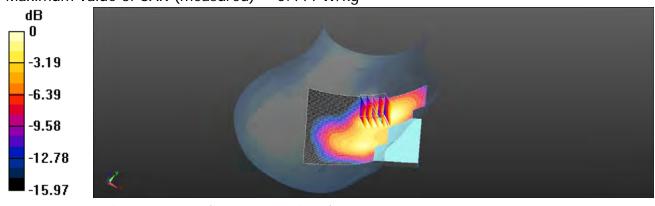
dy=8mm, dz=5mm

Reference Value = 5.758 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.544 W/kg

#### SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.220 W/kg

Maximum value of SAR (measured) = 0.444 W/kg



0 dB = 0.444 W/kq = -3.53 dBW/kq

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Page: 127 of 319

Date: 2014/11/18

## WCDMA Band II\_Speech mode\_Front side\_CH 9538\_15mm

Communication System: WCDMA; Frequency: 1907.6 MHz, Duty factor: 1:1

Medium parameters used: f = 1908 MHz;  $\sigma = 1.502$  S/m;  $\epsilon_r = 51.911$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.19, 7.19, 7.19); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.744 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

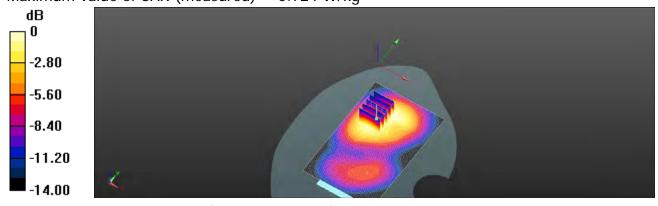
dy=8mm, dz=5mm

Reference Value = 7.439 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.874 W/kg

#### SAR(1 g) = 0.563 W/kg; SAR(10 g) = 0.353 W/kg

Maximum value of SAR (measured) = 0.724 W/kg



0 dB = 0.724 W/kq = -1.40 dBW/kq

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Page: 128 of 319

Date: 2014/11/18

#### WCDMA Band II\_Hotspot\_Bottom side\_CH 9538\_10mm

Communication System: WCDMA; Frequency: 1907.6 MHz, Duty factor: 1:1

Medium parameters used: f = 1908 MHz;  $\sigma = 1.502$  S/m;  $\epsilon_r = 51.911$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.19, 7.19, 7.19); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head:

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

#### Configuration/Body/Area Scan (51x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.86 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

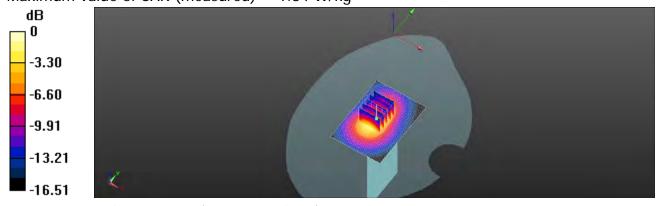
dv=8mm, dz=5mm

Reference Value = 25.63 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 2.22 W/kg

#### SAR(1 g) = 1.34 W/kg; SAR(10 g) = 0.738 W/kg

Maximum value of SAR (measured) = 1.84 W/kg



0 dB = 1.84 W/kq = 2.65 dBW/kq

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Page: 129 of 319

Date: 2014/11/17

#### WCDMA Band IV\_Head\_Re Cheek\_CH 1412

Communication System: WCDMA; Frequency: 1732.4 MHz, Duty factor: 1:1

Medium parameters used: f = 1732.4 MHz;  $\sigma = 1.364 \text{ S/m}$ ;  $\epsilon_r = 39.598$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(8, 8, 8); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Head/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.542 W/kg

## Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

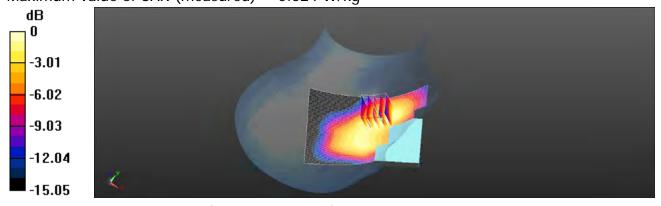
dy=8mm, dz=5mm

Reference Value = 4.484 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.625 W/kg

#### SAR(1 g) = 0.430 W/kg; SAR(10 g) = 0.283 W/kg

Maximum value of SAR (measured) = 0.524 W/kg



0 dB = 0.524 W/kq = -2.81 dBW/kq

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Page: 130 of 319

Date: 2014/11/17

## WCDMA Band IV\_Speech mode\_Front side\_CH 1412\_15mm

Communication System: WCDMA; Frequency: 1732.4 MHz, Duty factor: 1:1

Medium parameters used: f = 1732.4 MHz;  $\sigma = 1.444 \text{ S/m}$ ;  $\varepsilon_r = 54.47$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(7.63, 7.63, 7.63); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.753 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

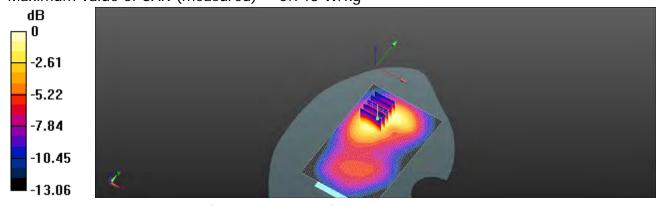
dy=8mm, dz=5mm

Reference Value = 10.95 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.876 W/kg

#### SAR(1 g) = 0.590 W/kg; SAR(10 g) = 0.376 W/kg

Maximum value of SAR (measured) = 0.748 W/kg



0 dB = 0.748 W/kq = -1.26 dBW/kq

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Page: 131 of 319

Date: 2014/11/17

# WCDMA Band IV\_Hotspot\_Back side\_CH 1513\_10mm\_repeat SAR test at the highest SAR measurement

Communication System: WCDMA; Frequency: 1752.6 MHz, Duty factor: 1:1

Medium parameters used: f = 1753 MHz;  $\sigma = 1.459$  S/m;  $\epsilon_r = 54.388$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.63, 7.63, 7.63); Calibrated: 2014/1/31;

• Sensor-Surface: 2mm (Mechanical Surface Detection)

• Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 1.56 W/kg

# Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

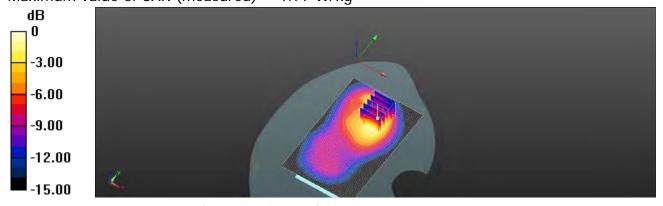
dy=8mm, dz=5mm

Reference Value = 12.47 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 1.35 W/kg; SAR(10 g) = 0.818 W/kg

Maximum value of SAR (measured) = 1.77 W/kg



0 dB = 1.77 W/kq = 2.48 dBW/kq

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Page: 132 of 319

Date: 2014/11/16

#### WCDMA Band V\_Head\_Le Cheek\_CH 4233

Communication System: WCDMA; Frequency: 846.6 MHz, Duty factor: 1:1

Medium parameters used: f = 847 MHz;  $\sigma = 0.894$  S/m;  $\varepsilon_r = 41.012$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(9.14, 9.14, 9.14); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Head/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.642 W/kg

## Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

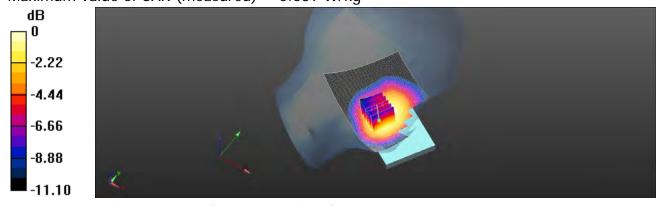
dy=8mm, dz=5mm

Reference Value = 5.542 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.721 W/kg

#### SAR(1 g) = 0.552 W/kg; SAR(10 g) = 0.399 W/kg

Maximum value of SAR (measured) = 0.639 W/kg



0 dB = 0.639 W/kq = -1.94 dBW/kq

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Page: 133 of 319

Date: 2014/11/16

## WCDMA Band V\_Speech mode\_Back side\_CH 4233\_15mm

Communication System: WCDMA; Frequency: 846.6 MHz, Duty factor: 1:1

Medium parameters used: f = 847 MHz;  $\sigma = 1.025$  S/m;  $\varepsilon_r = 52.785$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(9.03, 9.03, 9.03); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.508 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 20.45 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.574 W/kg

SAR(1 g) = 0.429 W/kg; SAR(10 g) = 0.310 W/kg

Maximum value of SAR (measured) = 0.510 W/kg

# Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm,

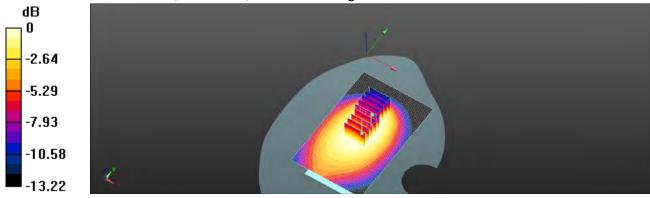
dy=8mm, dz=5mm

Reference Value = 20.45 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.552 W/kg

SAR(1 g) = 0.364 W/kg; SAR(10 g) = 0.253 W/kg

Maximum value of SAR (measured) = 0.469 W/kg



0 dB = 0.469 W/kq = -3.29 dBW/kq

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Page: 134 of 319

Date: 2014/11/16

## WCDMA Band V\_Hotspot\_Back side\_CH 4132\_10mm

Communication System: WCDMA; Frequency: 826.4 MHz, Duty factor: 1:1

Medium parameters used: f = 826.4 MHz;  $\sigma = 1.003 \text{ S/m}$ ;  $\epsilon_r = 52.958$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(9.03, 9.03, 9.03); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head:

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 1.13 W/kg

## Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dv=8mm, dz=5mm

Reference Value = 32.26 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.710 W/kg

Maximum value of SAR (measured) = 1.13 W/kg

# Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm,

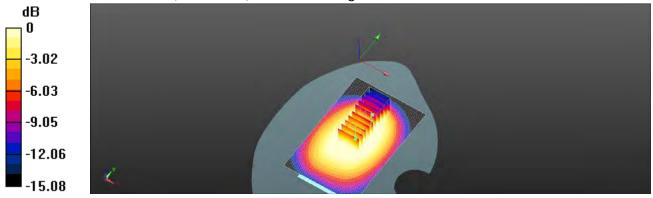
dy=8mm, dz=5mm

Reference Value = 32.26 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.997 W/kg

SAR(1 g) = 0.666 W/kg; SAR(10 g) = 0.434 W/kg

Maximum value of SAR (measured) = 0.829 W/kg



0 dB = 0.829 W/kq = -0.81 dBW/kq

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Page: 135 of 319

Date: 2014/11/24

## LTE Band 2 (20MHz) Head Le Cheek CH 19100 QPSK 1-99

Communication System: LTE; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.42 \text{ S/m}$ ;  $\epsilon r = 41.116$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.65, 7.65, 7.65); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.573 W/kg

#### Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

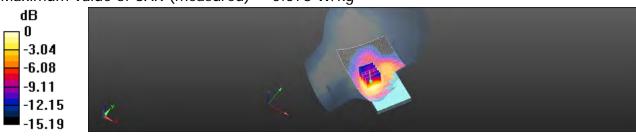
dx=8mm, dv=8mm, dz=5mm

Reference Value = 6.368 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.726 W/kg

#### SAR(1 g) = 0.453 W/kg; SAR(10 g) = 0.277 W/kg

Maximum value of SAR (measured) = 0.578 W/kg



0 dB = 0.578 W/kq = -2.38 dBW/kq

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Page: 136 of 319

Date: 2014/11/25

# LTE Band 2 (20MHz)\_Body-worn\_Back side\_CH 19100 QPSK 1-99 15mm

Communication System: LTE; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.542 \text{ S/m}$ ;  $\epsilon r = 51.826$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3938; ConvF(7.03, 7.03, 7.03); Calibrated: 2014/7/25;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE3 Sn360; Calibrated: 2014/2/17

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 0.975 W/kg

#### Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

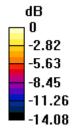
dx=8mm, dy=8mm, dz=5mm

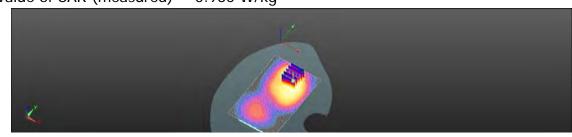
Reference Value = 11.17 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.17 W/kg

SAR(1 g) = 0.743 W/kg; SAR(10 g) = 0.454 W/kg

Maximum value of SAR (measured) = 0.960 W/kg





0 dB = 0.960 W/kq = -0.18 dBW/kq

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Page: 137 of 319

Date: 2014/11/25

## LTE Band 2 (20MHz)\_Hotspot\_Bottom side\_CH 19100 QPSK 1-99 10mm

Communication System: LTE; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.542 \text{ S/m}$ ;  $\epsilon r = 51.826$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3938; ConvF(7.03, 7.03, 7.03); Calibrated: 2014/7/25;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE3 Sn360; Calibrated: 2014/2/17

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/HEAD/Area Scan (41x71x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 1.87 W/kg

#### Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

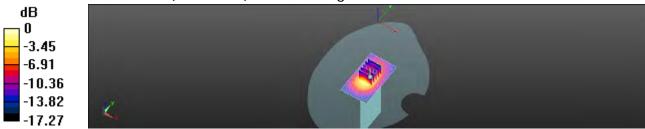
dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.56 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.24 W/kg

SAR(1 g) = 1.34 W/kg; SAR(10 g) = 0.728 W/kg

Maximum value of SAR (measured) = 1.84 W/kg



0 dB = 1.84 W/kq = 2.65 dBW/kq

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Page: 138 of 319

Date: 2014/11/22

## LTE Band 4 (20MHz)\_Head\_Le Cheek\_CH 20050\_QPSK\_1-0

Communication System: LTE; Frequency: 1720 MHz, Duty factor: 1:1

Medium parameters used: f = 1720 MHz;  $\sigma = 1.362 \text{ S/m}$ ;  $\epsilon r = 40.675$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.91, 7.91, 7.91); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/HEAD/Area Scan (61x111x1): Interpolated grid: Headdx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.809 W/kg

#### Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dv=8mm, dz=5mm

Reference Value = 5.896 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.924 W/kg

#### SAR(1 g) = 0.615 W/kg; SAR(10 g) = 0.383 W/kg

Maximum value of SAR (measured) = 0.777 W/kg



0 dB = 0.777 W/kq = -1.09 dBW/kq

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Page: 139 of 319

Date: 2014/11/23

# LTE Band 4 (20MHz)\_Body-worn\_Back side\_CH 20050\_QPSK\_1-0\_15mm

Communication System: LTE; Frequency: 1720 MHz, Duty factor: 1:1

Medium parameters used: f = 1720 MHz;  $\sigma = 1.442 \text{ S/m}$ ;  $\epsilon r = 53.954$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3938; ConvF(7.36, 7.36, 7.36); Calibrated: 2014/7/25;

Sensor-Surface: 2mm (Mechanical Surface Detection)

• Electronics: DAE3 Sn360; Calibrated: 2014/2/17

· Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: Headdx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 1.06 W/kg

#### Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

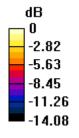
dx=8mm, dy=8mm, dz=5mm

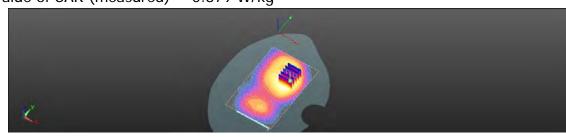
Reference Value = 11.78 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.679 W/kg; SAR(10 g) = 0.426 W/kg

Maximum value of SAR (measured) = 0.879 W/kg





0 dB = 0.879 W/kq = -0.56 dBW/kq

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Page: 140 of 319

Date: 2014/11/23

## LTE Band 4 (20MHz)\_Hotspot\_Bottom side\_CH 20175 QPSK 1-0 10mm

Communication System: LTE; Frequency: 1732.5 MHz, Duty factor: 1:1

Medium parameters used: f = 1732.5 MHz;  $\sigma = 1.451 \text{ S/m}$ ;  $\epsilon r = 53.838$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3938; ConvF(7.36, 7.36, 7.36); Calibrated: 2014/7/25;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE3 Sn360; Calibrated: 2014/2/17

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (41x71x1): Interpolated grid: Headdx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 1.68 W/kg

# Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

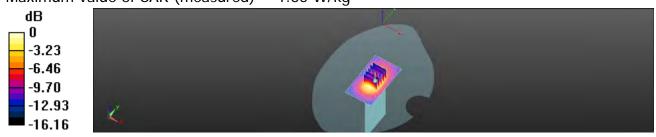
dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.45 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.648 W/kg

Maximum value of SAR (measured) = 1.65 W/kg



0 dB = 1.65 W/kq = 2.17 dBW/kq

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Page: 141 of 319

Date: 2014/11/26

## LTE Band 5 (10MHz)\_Head\_Le Cheek\_CH 20525\_QPSK\_1-49

Communication System: LTE; Frequency: 836.5 MHz, Duty factor: 1:1

Medium parameters used: f = 836.5 MHz;  $\sigma = 0.898 \text{ S/m}$ ;  $\epsilon r = 41.125$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.48, 10.48, 10.48); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.668 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.520 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.750 W/kg

#### SAR(1 g) = 0.581 W/kg; SAR(10 g) = 0.425 W/kg

Maximum value of SAR (measured) = 0.663 W/kg



0 dB = 0.663 W/kq = -1.79 dBW/kq

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Page: 142 of 319

Date: 2014/11/27

# LTE Band 5 (10MHz)\_Body-worn\_Back side\_CH 20600 QPSK 1-25 15mm

Communication System: LTE; Frequency: 844 MHz, Duty factor: 1:1

Medium parameters used: f = 844 MHz;  $\sigma = 0.977$  S/m;  $\epsilon r = 53.195$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3938; ConvF(9.35, 9.35, 9.35); Calibrated: 2014/7/25;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE3 Sn360; Calibrated: 2014/2/17

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 0.596 W/kg

#### Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.98 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.658 W/kg

SAR(1 g) = 0.506 W/kg; SAR(10 g) = 0.383 W/kg

Maximum value of SAR (measured) = 0.588 W/kg



0 dB = 0.588 W/kq = -2.31 dBW/kq

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Page: 143 of 319

Date: 2014/11/27

## LTE Band 5 (10MHz)\_Hotspot\_Back side\_CH 20525\_QPSK\_1-49\_10mm

Communication System: LTE; Frequency: 836.5 MHz, Duty factor: 1:1

Medium parameters used: f = 836.5 MHz;  $\sigma = 0.97 \text{ S/m}$ ;  $\epsilon r = 53.278$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.35, 9.35, 9.35); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.983 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dv=8mm, dz=5mm

Reference Value = 30.37 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.838 W/kg; SAR(10 g) = 0.630 W/kg

Maximum value of SAR (measured) = 0.976 W/kg

# Configuration/HEAD/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

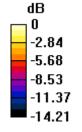
dx=8mm, dy=8mm, dz=5mm

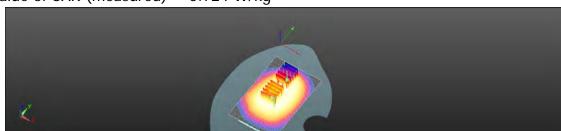
Reference Value = 30.37 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.893 W/kg

SAR(1 g) = 0.572 W/kg; SAR(10 g) = 0.392 W/kg

Maximum value of SAR (measured) = 0.724 W/kg





0 dB = 0.724 W/kq = -1.40 dBW/kq

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Page: 144 of 319

Date: 2014/11/30

## LTE Band 7 (20MHz)\_Head\_Re Cheek\_CH 21100\_QPSK\_1-99

Communication System: LTE; Frequency: 2535 MHz, Duty factor: 1:1

Medium parameters used: f = 2535 MHz;  $\sigma = 1.908 \text{ S/m}$ ;  $\epsilon r = 38.916$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(7.41, 7.41, 7.41); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (81x141x1): Interpolated grid: dx=12 mm,

dy=12 mm

Maximum value of SAR (interpolated) = 0.264 W/kg

#### Configuration/HEAD/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

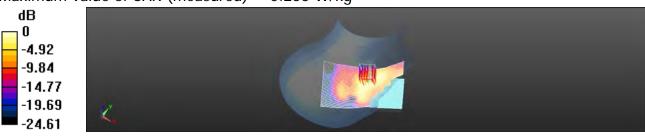
dx=5mm, dv=5mm, dz=5mm

Reference Value = 3.131 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.344 W/kg

#### SAR(1 g) = 0.185 W/kg; SAR(10 g) = 0.098 W/kg

Maximum value of SAR (measured) = 0.255 W/kg



0 dB = 0.255 W/kq = -5.94 dBW/kq

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Page: 145 of 319

Date: 2014/12/1

# LTE Band 7 (20MHz)\_Body-worn\_Back side\_CH 21350 QPSK 1-99 15mm

Communication System: LTE; Frequency: 2560 MHz, Duty factor: 1:1

Medium parameters used: f = 2560 MHz;  $\sigma = 2.093 \text{ S/m}$ ;  $\epsilon r = 51.581$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(7.36, 7.36, 7.36); Calibrated: 2014/8/28;

• Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (91x141x1): Interpolated grid: dx=12 mm,

dy=12 mm

Maximum value of SAR (interpolated) = 0.863 W/kg

## Configuration/HEAD/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

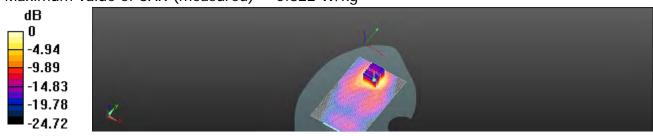
dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.160 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.559 W/kg; SAR(10 g) = 0.276 W/kg

Maximum value of SAR (measured) = 0.822 W/kg



0 dB = 0.822 W/kq = -0.85 dBW/kq

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Page: 146 of 319

Date: 2014/12/1

# LTE Band 7 (20MHz)\_Hotspot\_Back side\_CH 21350\_QPSK\_1-99\_10mm

Communication System: LTE; Frequency: 2560 MHz, Duty factor: 1:1

Medium parameters used: f = 2560 MHz;  $\sigma = 2.093 \text{ S/m}$ ;  $\epsilon r = 51.581$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(7.36, 7.36, 7.36); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (91x141x1): Interpolated grid: dx=12 mm,

dy=12 mm

Maximum value of SAR (interpolated) = 1.78 W/kg

# Configuration/HEAD/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

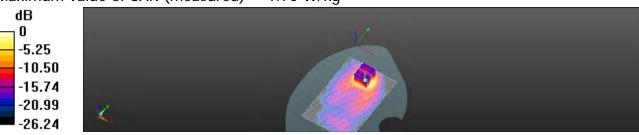
dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.065 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 2.29 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.528 W/kg

Maximum value of SAR (measured) = 1.70 W/kg



0 dB = 1.70 W/kq = 2.31 dBW/kq

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Page: 147 of 319

Date: 2014/11/21

# LTE Band 12 (10MHz)\_Head\_Le Cheek\_CH 23090\_QPSK\_1-25

Communication System: LTE; Frequency: 707 MHz, Duty factor: 1:1

Medium parameters used: f = 707 MHz;  $\sigma = 0.865 \text{ S/m}$ ;  $\epsilon r = 43.029$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.91, 10.91, 10.91); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.0494 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

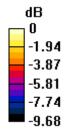
dx=8mm, dy=8mm, dz=5mm

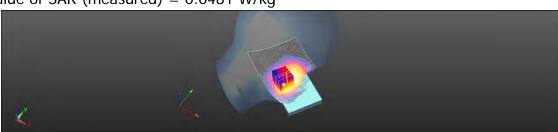
Reference Value = 1.915 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.0550 W/kg

SAR(1 g) = 0.043 W/kg; SAR(10 g) = 0.032 W/kg

Maximum value of SAR (measured) = 0.0481 W/kg





0 dB = 0.0481 W/kq = -13.18 dBW/kq

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Page: 148 of 319

Date: 2014/11/28

# LTE Band 12 (10MHz)\_Body-worn\_Back side\_CH 23090 QPSK 50-0 15mm

Communication System: LTE; Frequency: 707 MHz, Duty factor: 1:1

Medium parameters used: f = 707 MHz;  $\sigma = 0.927$  S/m;  $\epsilon r = 54.731$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 0.0922 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

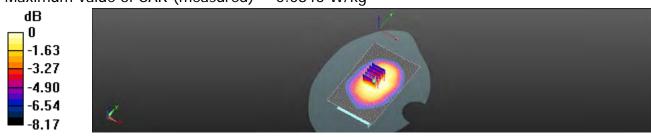
dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.835 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.0960 W/kg

SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.056 W/kg

Maximum value of SAR (measured) = 0.0846 W/kg



0 dB = 0.0846 W/kq = -10.72 dBW/kq

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Page: 149 of 319

Date: 2014/11/28

# LTE Band 12 (10MHz)\_Hotspot\_Back side\_CH 23090 QPSK 50-0 10mm

Communication System: LTE; Frequency: 707 MHz, Duty factor: 1:1

Medium parameters used: f = 707 MHz;  $\sigma = 0.927$  S/m;  $\epsilon r = 54.731$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 0.127 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

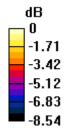
dx=8mm, dy=8mm, dz=5mm

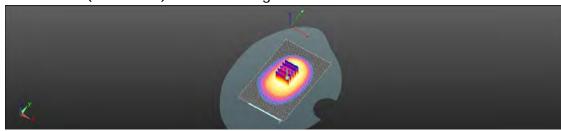
Reference Value = 11.64 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.140 W/kg

SAR(1 g) = 0.111 W/kg; SAR(10 g) = 0.085 W/kg

Maximum value of SAR (measured) = 0.128 W/kg





0 dB = 0.128 W/kq = -8.94 dBW/kq

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Page: 150 of 319

Date: 2014/11/21

# LTE Band 13 (10MHz)\_Head\_Le Cheek\_CH 23230\_QPSK\_1-49

Communication System: LTE; Frequency: 782 MHz, Duty factor: 1:1

Medium parameters used: f = 782 MHz;  $\sigma = 0.929 \text{ S/m}$ ;  $\epsilon r = 41.921$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.91, 10.91, 10.91); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.357 W/kg

# Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

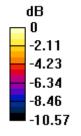
dx=8mm, dy=8mm, dz=5mm

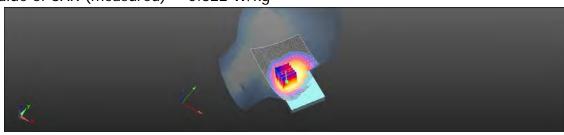
Reference Value = 3.956 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.378 W/kg

SAR(1 g) = 0.274 W/kg; SAR(10 g) = 0.203 W/kg

Maximum value of SAR (measured) = 0.322 W/kg





0 dB = 0.322 W/kq = -4.92 dBW/kq

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Page: 151 of 319

Date: 2014/11/28

# LTE Band 13 (10MHz)\_Body-worn\_Back side\_CH 23230\_QPSK\_1-49

Communication System: LTE; Frequency: 782 MHz, Duty factor: 1:1

Medium parameters used: f = 782 MHz;  $\sigma = 1.004 \text{ S/m}$ ;  $\epsilon r = 53.993$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.509 W/kg

# Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

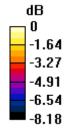
dx=8mm, dv=8mm, dz=5mm

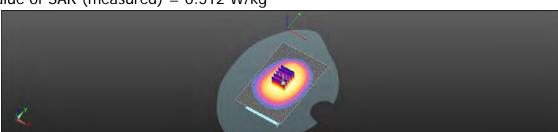
Reference Value = 22.95 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.565 W/kg

## SAR(1 g) = 0.442 W/kg; SAR(10 g) = 0.334 W/kg

Maximum value of SAR (measured) = 0.512 W/kg





0 dB = 0.512 W/kq = -2.91 dBW/kq

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Page: 152 of 319

Date: 2014/11/28

# LTE Band 13 (10MHz)\_Hotspot\_Back side\_CH 23230 QPSK 1-49 10mm

Communication System: LTE; Frequency: 782 MHz, Duty factor: 1:1

Medium parameters used: f = 782 MHz;  $\sigma = 1.004 \text{ S/m}$ ;  $\epsilon r = 53.993$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dv=15 mm

Maximum value of SAR (interpolated) = 0.681 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.20 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.751 W/kg

SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.451 W/kg

Maximum value of SAR (measured) = 0.683 W/kg

# Configuration/HEAD/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

dx=8mm, dy=8mm, dz=5mm

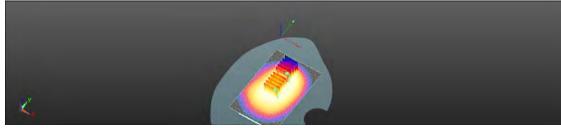
Reference Value = 26.20 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.681 W/kg

SAR(1 g) = 0.451 W/kg; SAR(10 g) = 0.312 W/kg

Maximum value of SAR (measured) = 0.569 W/kg





0 dB = 0.569 W/kg = -2.45 dBW/kg

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Page: 153 of 319

Date: 2014/11/21

# LTE Band 17 (10MHz)\_Head\_Le Cheek\_CH 23790\_QPSK\_50-0

Communication System: LTE; Frequency: 710 MHz, Duty factor: 1:1

Medium parameters used: f = 710 MHz;  $\sigma = 0.867 \text{ S/m}$ ;  $\epsilon r = 42.999$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.91, 10.91, 10.91); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.0429 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

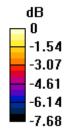
dx=8mm, dy=8mm, dz=5mm

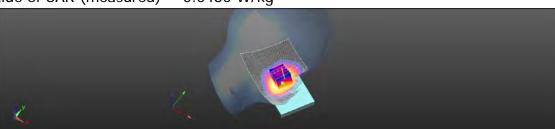
Reference Value = 1.658 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.0470 W/kg

SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.031 W/kg

Maximum value of SAR (measured) = 0.0430 W/kg





0 dB = 0.0430 W/kq = -13.66 dBW/kq

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Page: 154 of 319

Date: 2014/11/29

# LTE Band 17 (10MHz)\_Body-worn\_Back side\_CH 23780\_QPSK\_25-25\_15mm

Communication System: LTE; Frequency: 709 MHz, Duty factor: 1:1

Medium parameters used: f = 709 MHz;  $\sigma = 0.932$  S/m;  $\epsilon r = 54.704$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;

• Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.0666 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

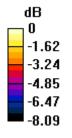
dx=8mm, dy=8mm, dz=5mm

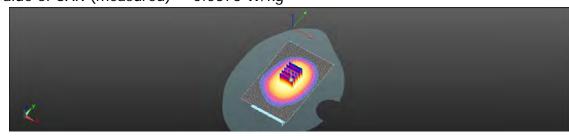
Reference Value = 8.482 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.0740 W/kg

SAR(1 g) = 0.059 W/kg; SAR(10 g) = 0.045 W/kg

Maximum value of SAR (measured) = 0.0676 W/kg





0 dB = 0.0676 W/kq = -11.70 dBW/kq

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Page: 155 of 319

Date: 2014/11/29

# LTE Band 17 (10MHz)\_Hotspot\_Back side\_CH 23780 QPSK 1-49 10mm

Communication System: LTE; Frequency: 709 MHz, Duty factor: 1:1

Medium parameters used: f = 709 MHz;  $\sigma = 0.932$  S/m;  $\epsilon r = 54.704$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;

• Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

· Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/HEAD/Area Scan (71x111x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.104 W/kg

## Configuration/HEAD/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

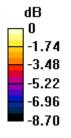
dx=8mm, dy=8mm, dz=5mm

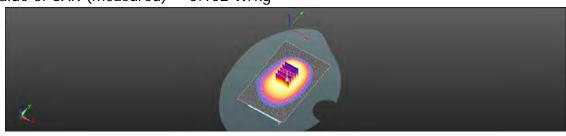
Reference Value = 10.72 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.113 W/kg

SAR(1 g) = 0.089 W/kg; SAR(10 g) = 0.069 W/kg

Maximum value of SAR (measured) = 0.102 W/kg





0 dB = 0.102 W/kq = -9.90 dBW/kq

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SGS Taiwan Ltd.



Page: 156 of 319

Date: 2014/11/23

#### WLAN802.11b\_Head\_RE Cheek\_CH 11

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2462 MHz, Duty

factor: 1:1

Medium parameters used: f = 2462 MHz;  $\sigma = 1.836 \text{ S/m}$ ;  $\epsilon_r = 39.117$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

#### DASY5 Configuration:

- Probe: EX3DV4 SN3770; ConvF(6.97, 6.97, 6.97); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom:Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/RE Cheek/Area Scan (91x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.963 W/kg

## Configuration/RE Cheek/Zoom Scan (7x7x7) / Cube 0: Measurement grid:

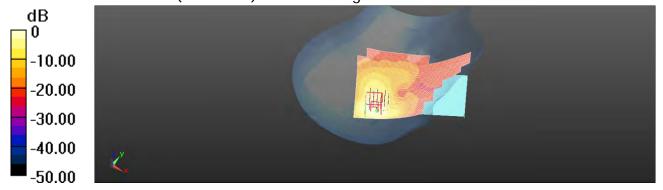
dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.12 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.587 W/kg; SAR(10 g) = 0.276 W/kg

Maximum value of SAR (measured) = 0.870 W/kg



0 dB = 0.963 W/kg = -0.16 dBW/kg

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Page: 157 of 319

Date: 2014/11/23

## WLAN802.11b\_Hotspot\_Back side\_CH 11\_10mm

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2462 MHz, Duty

factor: 1:1

Medium parameters used: f = 2462 MHz;  $\sigma = 2.063 \text{ S/m}$ ;  $\varepsilon_r = 50.06$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### DASY5 Configuration:

Probe: EX3DV4 - SN3770; ConvF(7.15, 7.15, 7.15); Calibrated: 4/24/2014;

- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Hotspot/Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 1.03 W/kg

## Configuration/Hotspot/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

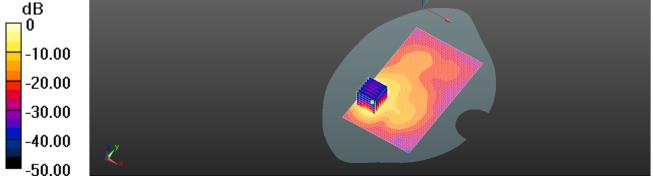
dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.334 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.42 W/kg

SAR(1 g) = 0.638 W/kg; SAR(10 g) = 0.276 W/kg

Maximum value of SAR (measured) = 1.02 W/kg



0 dB = 1.03 W/kg = 0.11 dBW/kg

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Page: 158 of 319

Date: 2014/11/17

#### WLAN802.11a5.2G\_Head\_RE Tilt\_CH 36

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5180 MHz, Duty factor: 1:1 Medium parameters used: f = 5180 MHz;  $\sigma = 4.589$  S/m;  $\epsilon_r = 36.126$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Right Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(5.25, 5.25, 5.25); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/RE Tilt/Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.425 W/kg

# Configuration/RE Tilt/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

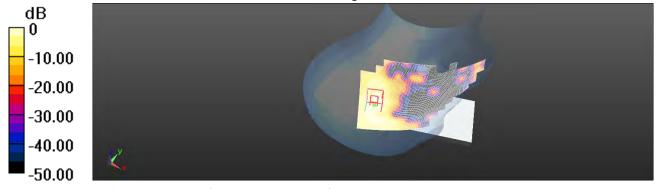
dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.951 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.913 W/kg

SAR(1 g) = 0.249 W/kg; SAR(10 g) = 0.087 W/kg

Maximum value of SAR (measured) = 0.471 W/kg



0 dB = 0.425 W/kq = -3.72 dBW/kq

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Page: 159 of 319

Date: 2014/11/19

# WLAN802.11a5.2G\_Body-worn\_Back side\_CH 36\_15mm

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5180 MHz, Duty factor: 1:1 Medium parameters used: f = 5180 MHz;  $\sigma = 5.393$  S/m;  $\epsilon_r = 48.66$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.56, 4.56, 4.56); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.625 W/kg

## Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.167 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.17 W/kg

# SAR(1 g) = 0.341 W/kg; SAR(10 g) = 0.144 W/kg

Maximum value of SAR (measured) = 0.609 W/kg



0 dB = 0.625 W/kq = -2.04 dBW/kq

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Page: 160 of 319

Date: 2014/11/18

#### WLAN802.11a5.3G\_Head\_RE Tilt\_CH 64

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5320 MHz, Duty factor: 1:1 Medium parameters used: f = 5320 MHz;  $\sigma = 4.767$  S/m;  $\epsilon_r = 35.798$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Right Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(5.07, 5.07, 5.07); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/RE Tilt/Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.389 W/kg

## Configuration/RE Tilt/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

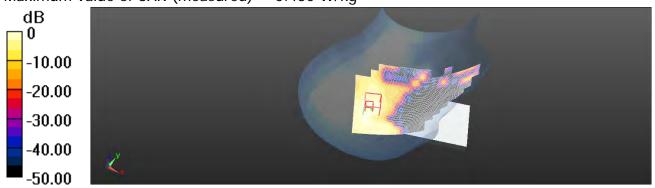
dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.042 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.901 W/kg

## SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.070 W/kg

Maximum value of SAR (measured) = 0.430 W/kg



0 dB = 0.389 W/kq = -4.10 dBW/kq

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Page: 161 of 319

Date: 2014/11/19

# WLAN802.11a5.3G\_Body-worn\_Back side\_CH 64\_15mm

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5320 MHz, Duty factor: 1:1 Medium parameters used: f=5320 MHz;  $\sigma=5.59$  S/m;  $\epsilon_r=48.196$ ;  $\rho=1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.38, 4.38, 4.38); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (111x181x1): Interpolated grid: dx=10 mm,

dy=10 mm

Maximum value of SAR (interpolated) = 0.592 W/kg

## Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

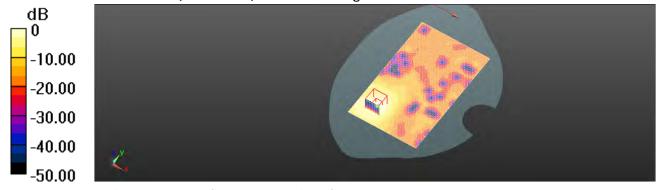
dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.909 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.15 W/kg

# SAR(1 g) = 0.319 W/kg; SAR(10 g) = 0.131 W/kg

Maximum value of SAR (measured) = 0.576 W/kg



0 dB = 0.592 W/kq = -2.27 dBW/kq

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Page: 162 of 319

Date: 2014/11/17

#### WLAN802.11a5.6G Head RE Cheek CH 132

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5660 MHz, Duty factor: 1:1 Medium parameters used: f = 5660 MHz;  $\sigma = 5.153 \text{ S/m}$ ;  $\epsilon_r = 35.031$ ;  $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.48, 4.48, 4.48); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/RE Cheek/Area Scan (111x181x1): Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.833 W/kg

# Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

dx=4mm, dy=4mm, dz=2mm

Reference Value = 7.722 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 0.480 W/kg; SAR(10 g) = 0.155 W/kg

Maximum value of SAR (measured) = 0.974 W/kg

# Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 1: Measurement grid:

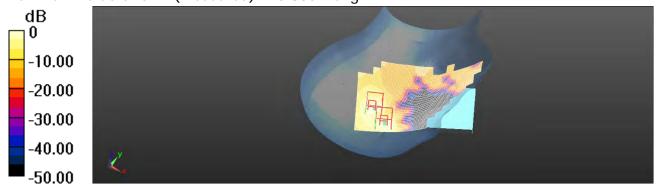
dx=4mm, dy=4mm, dz=2mm

Reference Value = 7.722 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 1.88 W/kg

SAR(1 g) = 0.412 W/kg; SAR(10 g) = 0.131 W/kg

Maximum value of SAR (measured) = 0.835 W/kg



0 dB = 0.833 W/kg = -0.79 dBW/kg

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Page: 163 of 319

Date: 2014/11/19

# WLAN802.11a5.6G\_Body-worn\_Back side\_CH 132\_15mm

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5660 MHz, Duty factor: 1:1 Medium parameters used: f = 5660 MHz;  $\sigma = 6.058 \text{ S/m}$ ;  $\varepsilon_r = 47.18$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(3.76, 3.76, 3.76); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (111x181x1): Interpolated grid: dx=10 mm,

dy=10 mm

Maximum value of SAR (interpolated) = 0.735 W/kg

## Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

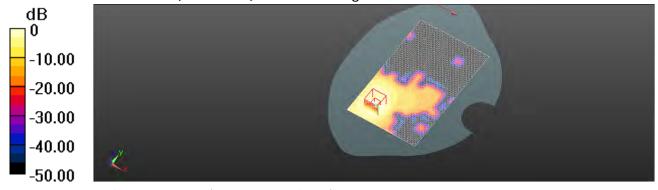
dx=4mm, dv=4mm, dz=2mm

Reference Value = 1.359 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.382 W/kg; SAR(10 g) = 0.139 W/kg

Maximum value of SAR (measured) = 0.736 W/kg



0 dB = 0.735 W/kq = -1.34 dBW/kq

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Page: 164 of 319

Date: 2014/11/18

#### WLAN802.11a5.8G Head RE Cheek CH 161

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5805 MHz, Duty factor: 1:1 Medium parameters used : f = 5805 MHz;  $\sigma = 5.321$  S/m;  $\varepsilon_r = 34.677$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Right Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.65, 4.65, 4.65); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/RE Cheek/Area Scan (111x181x1): Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.822 W/kg

# Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.226 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 2.28 W/kg

SAR(1 g) = 0.493 W/kg; SAR(10 g) = 0.152 W/kg

Maximum value of SAR (measured) = 0.995 W/kg

# Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 1: Measurement grid:

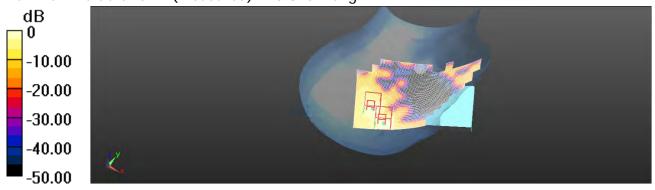
dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.226 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 2.03 W/kg

SAR(1 g) = 0.406 W/kg; SAR(10 g) = 0.126 W/kg

Maximum value of SAR (measured) = 0.825 W/kg



0 dB = 0.822 W/kg = -0.85 dBW/kg

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Page: 165 of 319

Date: 2014/11/19

# WLAN802.11a5.8G Body-worn Back side CH 165 15mm

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5825 MHz, Duty factor: 1:1 Medium parameters used : f = 5825 MHz;  $\sigma = 6.263$  S/m;  $\varepsilon_r = 46.889$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.13, 4.13, 4.13); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Body/Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.534 W/kg

# Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.357 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.283 W/kg; SAR(10 g) = 0.110 W/kg

Maximum value of SAR (measured) = 0.543 W/kg

# Configuration/Body/Zoom Scan (7x7x12)/Cube 1: Measurement grid:

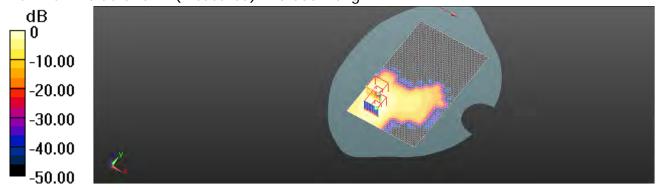
dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.357 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.22 W/kg

# SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.126 W/kg

Maximum value of SAR (measured) = 0.560 W/kg



0 dB = 0.534 W/kg = -2.72 dBW/kg

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Page: 166 of 319

# 6. System Verification

Date: 2014/11/21

## Dipole 750 MHz\_SN:1015\_Head

Communication System: CW; Frequency: 750 MHz, Duty factor: 1:1

Medium parameters used: f = 750 MHz;  $\sigma = 0.902 \text{ S/m}$ ;  $\varepsilon_r = 42.233$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.91, 10.91, 10.91); Calibrated: 2014/8/28;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.63 W/kg

## Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

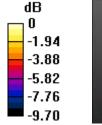
dx=5mm, dy=5mm, dz=5mm

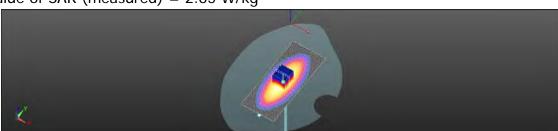
Reference Value = 56.79 V/m: Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.09 W/kg

SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.43 W/kg

Maximum value of SAR (measured) = 2.65 W/kg





0 dB = 2.65 W/kq = 4.24 dBW/kq

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Page: 167 of 319

Date: 2014/11/28

## Dipole 750 MHz\_SN:1015\_Body\_1

Communication System: CW; Frequency: 750 MHz, Duty factor: 1:1

Medium parameters used: f = 750 MHz;  $\sigma = 0.972 \text{ S/m}$ ;  $\varepsilon_r = 54.319$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.96 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

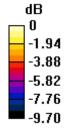
dx=5mm, dv=5mm, dz=5mm

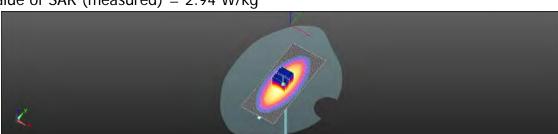
Reference Value = 56.48 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.49 W/kg

Maximum value of SAR (measured) = 2.94 W/kg





0 dB = 2.94 W/kq = 4.68 dBW/kq

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Page: 168 of 319

Date: 2014/11/29

## Dipole 750 MHz\_SN:1015\_Body\_2

Communication System: CW; Frequency: 750 MHz, Duty factor: 1:1

Medium parameters used: f = 750 MHz;  $\sigma = 0.976 \text{ S/m}$ ;  $\varepsilon_r = 54.296$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.29, 10.29, 10.29); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.94 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

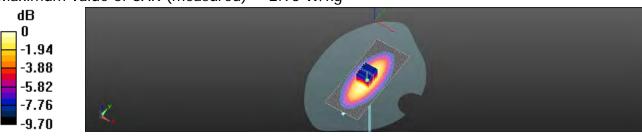
dx=5mm, dv=5mm, dz=5mm

Reference Value = 56.331 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.51 W/kg

SAR(1 g) = 2.27 W/kg; SAR(10 g) = 1.48 W/kg

Maximum value of SAR (measured) = 2.93 W/kg



0 dB = 2.93 W/kq = 4.67 dBW/kq

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Page: 169 of 319

Date: 2014/11/16

## Dipole 835 MHz\_SN:4d063\_Head

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz;  $\sigma = 0.883 \text{ S/m}$ ;  $\epsilon_r = 41.166$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(9.14, 9.14, 9.14); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (41x121x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 3.66 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

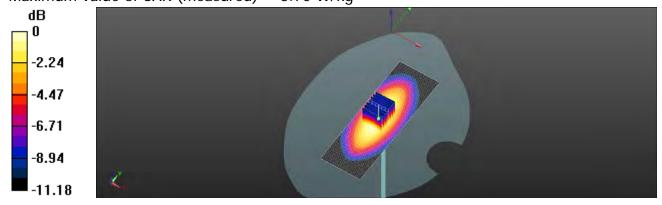
dx=5mm, dy=5mm, dz=5mm

Reference Value = 62.44 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 4.37 W/kg

SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.58 W/kg

Maximum value of SAR (measured) = 3.70 W/kg



0 dB = 3.70 W/kq = 5.68 dBW/kq

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Page: 170 of 319

Date: 2014/11/26

# Dipole 835 MHz\_SN:4d063\_Head

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz;  $\sigma = 0.897$  S/m;  $\varepsilon_r = 41.143$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3923; ConvF(10.48, 10.48, 10.48); Calibrated: 2014/8/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2014/8/26
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 3.43 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

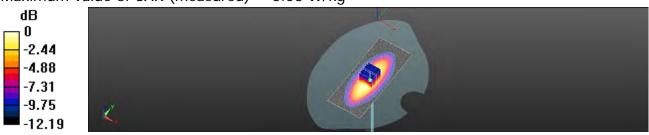
dx=5mm, dv=5mm, dz=5mm

Reference Value = 58.55 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 4.48 W/kg

SAR(1 q) = 2.51 W/kq; SAR(10 q) = 1.63 W/kq

Maximum value of SAR (measured) = 3.58 W/kg



0 dB = 3.58 W/kq = 5.54 dBW/kq

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Page: 171 of 319

Date: 2014/11/16

# Dipole 835 MHz\_SN:4d063\_Body

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz;  $\sigma = 1.013 \text{ S/m}$ ;  $\varepsilon_r = 52.886$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3831; ConvF(9.03, 9.03, 9.03); Calibrated: 2014/1/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2014/6/18
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 3.39 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

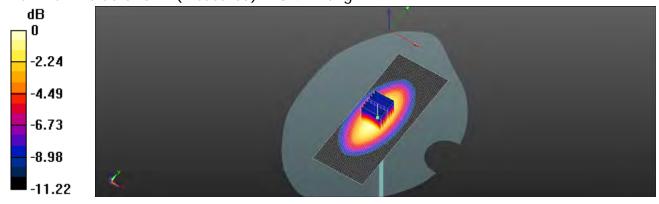
dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.93 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 4.05 W/kg

SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg

Maximum value of SAR (measured) = 3.42 W/kg



0 dB = 3.42 W/kq = 5.34 dBW/kq

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Page: 172 of 319

Date: 2014/11/27

## Dipole 835 MHz\_SN:4d063\_Body

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz;  $\sigma = 0.969$  S/m;  $\varepsilon_r = 53.304$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(9.35, 9.35, 9.35); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 3.11 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

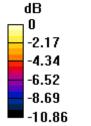
dx=5mm, dv=5mm, dz=5mm

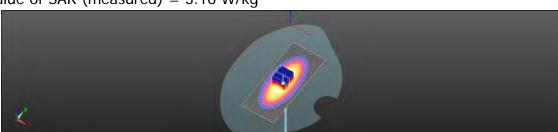
Reference Value = 56.177 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.71 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.62 W/kg

Maximum value of SAR (measured) = 3.16 W/kg





0 dB = 3.16 W/kq = 5.00 dBW/kq

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Page: 173 of 319

Date: 2014/11/17

## Dipole 1750 MHz\_SN:1008\_Head

Communication System: CW; Frequency: 1750 MHz, Duty factor: 1:1

Medium parameters used: f = 1750 MHz;  $\sigma = 1.377 \text{ S/m}$ ;  $\epsilon_r = 39.564$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(8, 8, 8); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x61x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 12.6 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

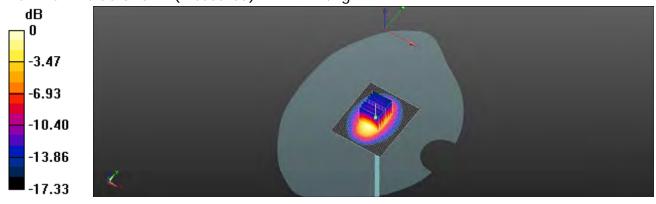
dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.47 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 15.3 W/kg

# SAR(1 g) = 9.34 W/kg; SAR(10 g) = 4.91 W/kg

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



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

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Page: 174 of 319

Date: 2014/11/22

## Dipole 1750 MHz\_SN:1008\_Head

Communication System: CW; Frequency: 1750 MHz, Duty factor: 1:1

Medium parameters used: f = 1750 MHz;  $\sigma = 1.391 \text{ S/m}$ ;  $\epsilon_r = 40.597$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3938; ConvF(7.91, 7.91, 7.91); Calibrated: 2014/7/25

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE3 Sn360; Calibrated: 2014/2/17

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x101x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 13.0 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

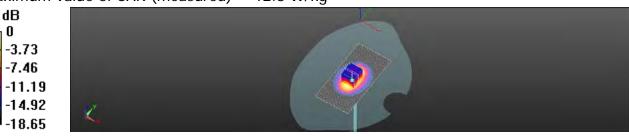
dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.91 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 8.98 W/kg; SAR(10 g) = 4.83 W/kg

Maximum value of SAR (measured) = 12.8 W/kg



0 dB = 12.8 W/kg = 11.07 dBW/kg

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Page: 175 of 319

Date: 2014/11/17

# Dipole 1750 MHz\_SN:1008\_Body

Communication System: CW; Frequency: 1750 MHz, Duty factor: 1:1

Medium parameters used: f = 1750 MHz;  $\sigma = 1.457 \text{ S/m}$ ;  $\epsilon_r = 54.404$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.63, 7.63, 7.63); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head:

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x61x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 11.7 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

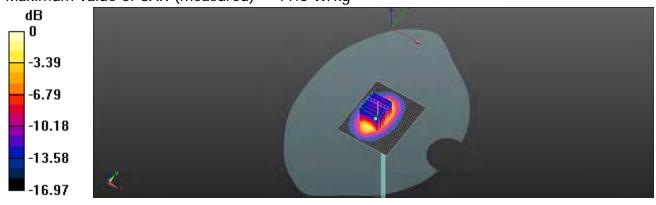
dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.34 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 14.4 W/kg

## SAR(1 g) = 9.38 W/kg; SAR(10 g) = 5.06 W/kg

Maximum value of SAR (measured) = 11.6 W/kg



0 dB = 11.6 W/kq = 10.64 dBW/kq

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Page: 176 of 319

Date: 2014/11/23

## Dipole 1750 MHz\_SN:1008\_Body

Communication System: CW; Frequency: 1750 MHz, Duty factor: 1:1

Medium parameters used: f = 1750 MHz;  $\sigma = 1.471 \text{ S/m}$ ;  $\varepsilon_r = 53.752$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.36, 7.36, 7.36); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x101x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.1 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

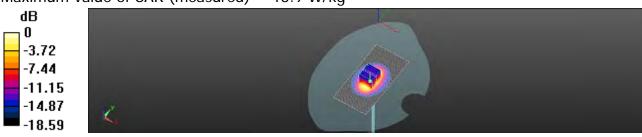
dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.59 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 9.48 W/kg; SAR(10 g) = 5.02 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kq = 11.43 dBW/kq

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Page: 177 of 319

Date: 2014/11/18

## Dipole 1900 MHz\_SN:5d027\_Head

Communication System: CW; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.38 \text{ S/m}$ ;  $\epsilon_r = 39.35$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.79, 7.79, 7.79); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x61x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 12.4 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

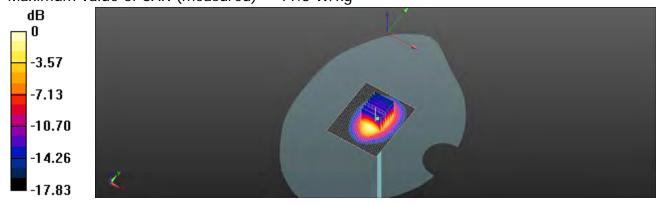
dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.56 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 15.4 W/kg

## SAR(1 g) = 9.78 W/kg; SAR(10 g) = 5.13 W/kg

Maximum value of SAR (measured) = 11.8 W/kg



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

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Page: 178 of 319

Date: 2014/11/24

## Dipole 1900 MHz\_SN:5d027\_Head

Communication System: CW; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.42 \text{ S/m}$ ;  $\varepsilon_r = 41.116$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.65, 7.65, 7.65); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (41x101x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.2 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

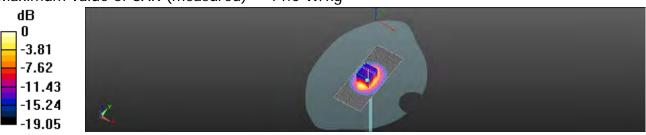
dx=5mm, dv=5mm, dz=5mm

Reference Value = 98.781 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.68 W/kg; SAR(10 g) = 5.04 W/kg

Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kq = 11.45 dBW/kq

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Page: 179 of 319

Date: 2014/11/18

## Dipole 1900 MHz\_SN:5d027\_Body

Communication System: CW; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.491 \text{ S/m}$ ;  $\varepsilon_r = 51.93$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

Probe: EX3DV4 - SN3831; ConvF(7.19, 7.19, 7.19); Calibrated: 2014/1/31;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn915; Calibrated: 2014/6/18

Phantom: Head;

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (51x61x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.6 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

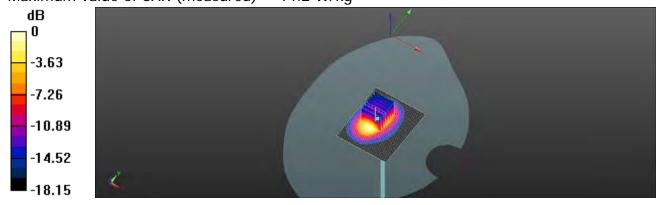
dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.49 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 18.1 W/kg

## SAR(1 g) = 9.94 W/kg; SAR(10 g) = 5.14 W/kg

Maximum value of SAR (measured) = 14.2 W/kg



0 dB = 14.2 W/kq = 11.52 dBW/kq

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Page: 180 of 319

Date: 2014/11/25

## Dipole 1900 MHz\_SN:5d027\_Body

Communication System: CW; Frequency: 1900 MHz, Duty factor: 1:1

Medium parameters used: f = 1900 MHz;  $\sigma = 1.542 \text{ S/m}$ ;  $\varepsilon_r = 51.826$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

#### **DASY5** Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.03, 7.03, 7.03); Calibrated: 2014/7/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2014/2/17
- Phantom: Head
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/Pin=250mW/Area Scan (41x101x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.6 W/kg

# Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

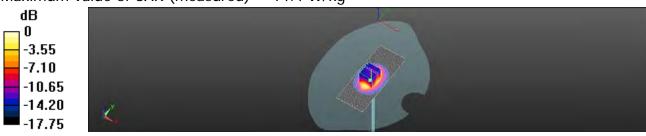
dx=5mm, dv=5mm, dz=5mm

Reference Value = 95.672 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 18.3 W/kg

# SAR(1 q) = 10.2 W/kq; SAR(10 q) = 5.3 W/kq

Maximum value of SAR (measured) = 14.4 W/kg



0 dB = 14.4 W/kq = 11.58 dBW/kq

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Page: 181 of 319

Date: 2014/11/23

## Dipole 2450 MHz\_SN:727\_Head

Communication System: CW; Frequency: 2450 MHz, Duty factor: 1:1

Medium parameters used: f = 2450 MHz;  $\sigma = 1.823 \text{ S/m}$ ;  $\epsilon_r = 39.185$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(6.97, 6.97, 6.97); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom:Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=250mW, dist=2mm: Interpolated grid: dx=12

mm, dy=12 mm

Maximum value of SAR (interpolated) = 22.3 W/kg

## Configuration/d=10mm, Pin=250mW, dist=2mm /Cube 0: Measurement

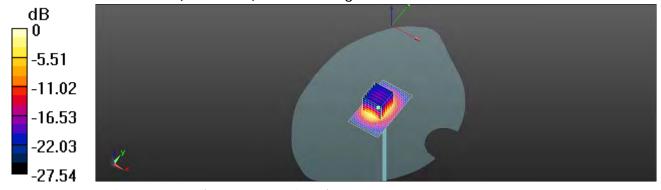
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.77 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 29.0 W/kg

## SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.02 W/kg

Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 22.3 W/kq = 13.47 dBW/kq

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Page: 182 of 319

Date: 2014/11/23

## Dipole 2450 MHz\_SN:727\_Body

Communication System: CW; Frequency: 2450 MHz, Duty factor: 1:1

Medium parameters used: f = 2450 MHz;  $\sigma = 2.045 \text{ S/m}$ ;  $\epsilon_r = 50.104$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(7.15, 7.15, 7.15); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom:Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=250mW, dist=2mm: Interpolated grid: dx=12

mm, dy=12 mm

Maximum value of SAR (interpolated) = 23.8 W/kg

## Configuration/d=10mm, Pin=250mW, dist=2mm /Cube 0: Measurement

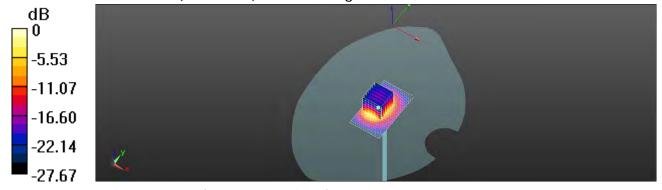
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.07 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 30.7 W/kg

## SAR(1 g) = 13.1 W/kg; SAR(10 g) = 5.85 W/kg

Maximum value of SAR (measured) = 22.3 W/kg



0 dB = 23.8 W/kq = 13.76 dBW/kq

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Page: 183 of 319

Date: 2014/11/30

## Dipole 2600 MHz\_SN:1005\_Head

Communication System: CW; Frequency: 2600 MHz, Duty factor: 1:1

Medium parameters used: f = 2600 MHz;  $\sigma = 1.972 \text{ S/m}$ ;  $\epsilon_r = 38.778$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

Probe: EX3DV4 - SN3923; ConvF(7.41, 7.41, 7.41); Calibrated: 2014/8/28;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=12

mm, dy=12 mm

Maximum value of SAR (interpolated) = 24.0 W/kg

## Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

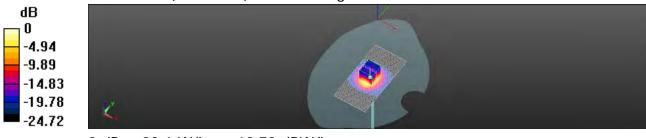
dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.3 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 33.3 W/kg

SAR(1 g) = 14.9 W/kg; SAR(10 g) = 6.48 W/kg

Maximum value of SAR (measured) = 23.6 W/kg



0 dB = 23.6 W/kq = 13.72 dBW/kq

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Page: 184 of 319

Date: 2014/12/1

## Dipole 2600 MHz\_SN:1005\_Body

Communication System: CW; Frequency: 2600 MHz, Duty factor: 1:1

Medium parameters used: f = 2600 MHz;  $\sigma = 2.138 \text{ S/m}$ ;  $\varepsilon_r = 51.492$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

Probe: EX3DV4 - SN3923; ConvF(7.36, 7.36, 7.36); Calibrated: 2014/8/28;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1260; Calibrated: 2014/8/26

Phantom: Head

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/Pin=250mW/Area Scan (51x91x1): Interpolated grid: dx=12

mm, dy=12 mm

Maximum value of SAR (interpolated) = 25.2 W/kg

## Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

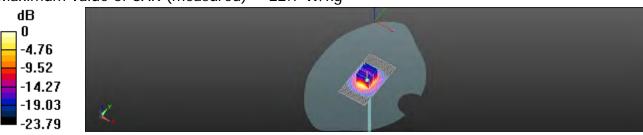
dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.663 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 31.4 W/kg

SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.34 W/kg

Maximum value of SAR (measured) = 22.7 W/kg



0 dB = 22.7 W/kq = 13.56 dBW/kq

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Page: 185 of 319

Date: 2014/11/17

## Dipole 5200 MHz\_SN:1104\_Head

Communication System: CW; Frequency: 5200 MHz, Duty factor: 1:1

Medium parameters used: f = 5200 MHz;  $\sigma = 4.618 \text{ S/m}$ ;  $\epsilon_r = 36.074$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(5.25, 5.25, 5.25); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 18.4 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm /Cube 0: Measurement

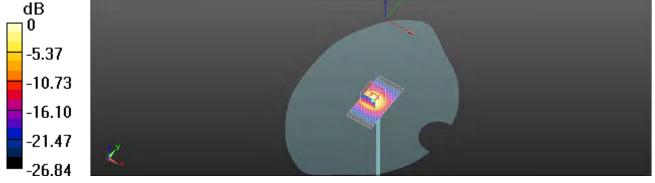
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 59.62 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 36.6 W/kg

SAR(1 g) = 8.37 W/kg; SAR(10 g) = 2.43 W/kg

Maximum value of SAR (measured) = 18.4 W/kg



0 dB = 18.4 W/kg = 12.66 dBW/kg

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Page: 186 of 319

Date: 2014/11/19

## Dipole 5200 MHz\_SN:1104\_Body

Communication System: CW; Frequency: 5200 MHz, Duty factor: 1:1

Medium parameters used: f = 5200 MHz;  $\sigma = 5.407 \text{ S/m}$ ;  $\epsilon_r = 48.601$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.56, 4.56, 4.56); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 19.2 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm /Cube 0: Measurement

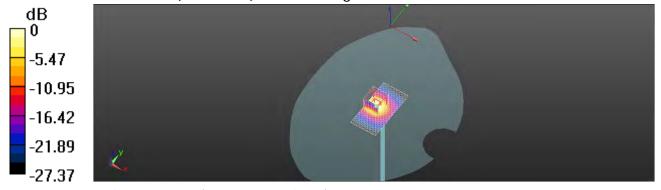
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 48.19 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 29.8 W/kg

## SAR(1 g) = 7.59 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 19.2 W/kq = 12.82 dBW/kq

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Page: 187 of 319

Date: 2014/11/18

## Dipole 5300 MHz\_SN:1104\_Head

Communication System: CW; Frequency: 5300 MHz, Duty factor: 1:1

Medium parameters used: f = 5300 MHz;  $\sigma = 4.731 \text{ S/m}$ ;  $\epsilon_r = 35.828$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(5.07, 5.07, 5.07); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom:Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.4 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm /Cube 0: Measurement

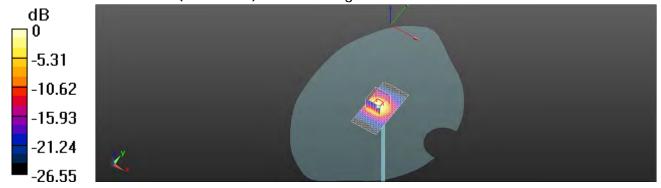
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.38 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 34.8 W/kg

SAR(1 g) = 8.32 W/kg; SAR(10 g) = 2.32 W/kg

Maximum value of SAR (measured) = 17.1 W/kg



0 dB = 17.4 W/kg = 12.40 dBW/kg

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Page: 188 of 319

Date: 2014/11/19

## Dipole 5300 MHz\_SN:1104\_Body

Communication System: CW; Frequency: 5300 MHz, Duty factor: 1:1

Medium parameters used: f = 5300 MHz;  $\sigma = 5.571 \text{ S/m}$ ;  $\epsilon_r = 48.323$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.38, 4.38, 4.38); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom:Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 16.5 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm/Cube 0: Measurement

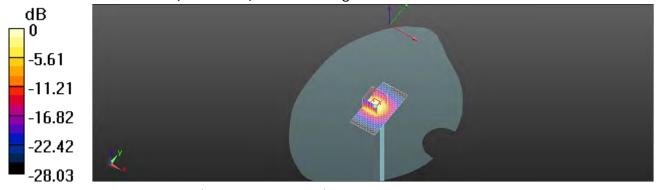
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 44.03 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 32.5 W/kg

## SAR(1 g) = 7.83 W/kg; SAR(10 g) = 2.24 W/kg

Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.5 W/kq = 12.17 dBW/kq

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Page: 189 of 319

Date: 2014/11/17

## Dipole 5600 MHz\_SN:1104\_Head

Communication System: CW; Frequency: 5600 MHz, Duty factor: 1:1

Medium parameters used: f = 5600 MHz;  $\sigma = 5.081 \text{ S/m}$ ;  $\epsilon_r = 35.142$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.48, 4.48, 4.48); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 19.7 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm /Cube 0: Measurement

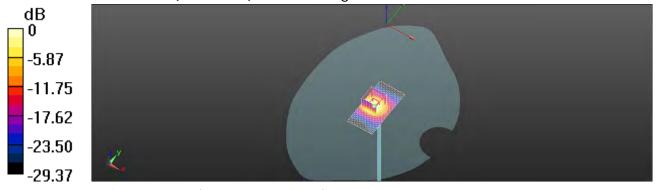
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.23 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 39.8 W/kg

## SAR(1 g) = 8.74 W/kg; SAR(10 g) = 2.58 W/kg

Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.7 W/kq = 12.93 dBW/kq

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Page: 190 of 319

Date: 2014/11/19

## Dipole 5600 MHz\_SN:1104\_Body

Communication System: CW; Frequency: 5600 MHz, Duty factor: 1:1

Medium parameters used: f = 5600 MHz;  $\sigma = 6.041 \text{ S/m}$ ;  $\epsilon_r = 47.501$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(3.76, 3.76, 3.76); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom:Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 18.2 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm/Cube 0: Measurement

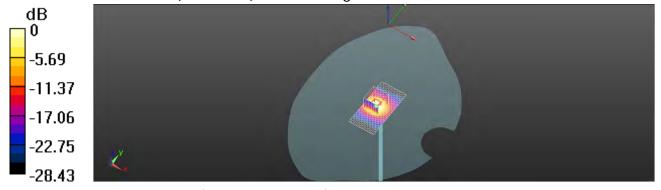
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 54.52 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 37.3 W/kg

## SAR(1 g) = 8.4 W/kg; SAR(10 g) = 2.35 W/kg

Maximum value of SAR (measured) = 18.2 W/kg



0 dB = 18.2 W/kq = 12.59 dBW/kq

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Page: 191 of 319

Date: 2014/11/18

## Dipole 5800 MHz\_SN:1104\_Head

Communication System: CW; Frequency: 5800 MHz, Duty factor: 1:1

Medium parameters used: f = 5800 MHz;  $\sigma = 5.315 \text{ S/m}$ ;  $\epsilon_r = 34.701$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

Probe: EX3DV4 - SN3770; ConvF(4.65, 4.65, 4.65); Calibrated: 4/24/2014;

- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head:
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.8 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm /Cube 0: Measurement

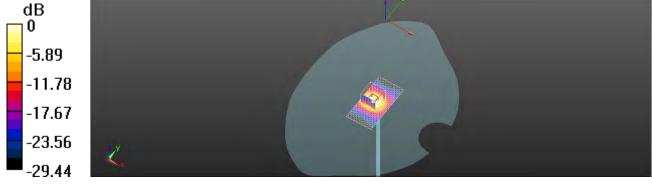
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.30 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 38.6 W/kg

SAR(1 g) = 8.11 W/kg; SAR(10 g) = 2.33 W/kg

Maximum value of SAR (measured) = 17.7 W/kg



0 dB = 17.8 W/kg = 12.50 dBW/kg

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Page: 192 of 319

Date: 2014/11/19

## Dipole 5800 MHz\_SN:1104\_Body

Communication System: CW; Frequency: 5800 MHz, Duty factor: 1:1

Medium parameters used: f = 5800 MHz;  $\sigma = 6.2 \text{ S/m}$ ;  $\varepsilon_r = 46.941$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

## **DASY5** Configuration:

- Probe: EX3DV4 SN3770; ConvF(4.13, 4.13, 4.13); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 8/27/2014
- Phantom: Head;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

# Configuration/d=10mm, Pin=100mW, dist=2mm: Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 16.9 W/kg

## Configuration/d=10mm, Pin=100mW, dist=2mm/Cube 0: Measurement

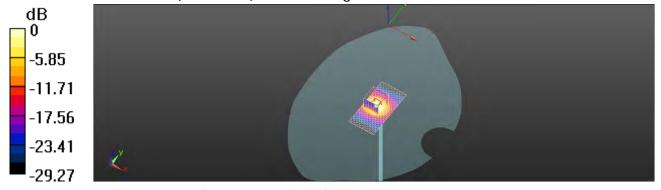
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 51.84 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 36.2 W/kg

## SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.16 W/kg

Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kq = 12.28 dBW/kq

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Page: 193 of 319

## 7. DAE & Probe Calibration Certificate

Calibration Laboratory of CHISS Schweizerischer Kalibriardienst S Schmid & Partner Sarvice suisse d'étalonnage C C TARATO Engineering AG sughausstrasse 43, 8004 Zurich, Switzerland Servizio svizzero di terature Swiss Calibration Service Accredited by the Swiss Accreditation Service (SAS) Accreditation No.: SCS 108 The Swiss Accreditation Service is one of the signatories to the EA Multillateral Agreement for the recognition of calibration certificates Certificate No: DAE4-1260\_Aug14 SGS-TW (Auden) CALIBRATION CERTIFICATE DAE4 - SD 000 D04 BM - SN: 1260 QA CAL-06.v26 Calibration procedure for the data acquisition electronics (DAE) Dathration date: August 26, 2014 This calibration coefficiate occuments the paceatility to readona 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 tacility, environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE princil for calibration) Primary Standards ID P Cas Date (Certificate No.) Scheduled Calibration 01-De-13 (No:13976) Doi:14 SN 0810278 Kathley Multimater Type 2001 Dheck Date (in house) Scheduled Check SE UWS 053 AA 1001 U7-Jan-14 (in figure check) Auto DAE Californion Unit in house check JanvitS SE LINES 000 AA 1002 07-Jan-14 (in house check) In bouse check: Jan-15 Calibrator Box V2.1 Function Calibrated by: Domnique Statten Deputy Fectifical Misnager Approved by: Fin Edmhob Issued: August 26, 2014 This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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Certificate No: DAE4-1260, Aug 14

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Page 9 at 5



Page: 194 of 319

Calibration Laboratory of Schmid & Partner

Engineering AG aughausstrasse 43, 8004 Zurich, Switzerland





Service suisse d'étalennage C Servizio svizzero di taratura Swee Calibration Service

Accreditation No.: SCS 108

Accomined by the Swiss Ascinditation Service (SAS) The Swiss Accreditation Service is one of the eignalaries to the EA Multitudent Agreement for the recognition of calibration certification

#### Glossary

DAE

data acquisition electronics

Connector angle

information used in DASY system to align probe sensor X to the robot

coordinate system.

#### Methods Applied and Interpretation of Parameters

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

Destribute No: DAS4-1950 Aug 14

Page 2 et 6

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Page: 195 of 319

#### DC Voltage Measurement

A/D Convener Resolution nominal

High Rerige ILSB = 6.1 µV , full range = -100 ...+600 mV Low Range: ILSB = 61 nV , full range = -1......+2 mV DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec.

Calibration Factors	X	Υ	- 2
High Range	406.033 ± 0.02% (k=2)	405.001 ± 0.02% (k=2)	405 579 ± 0.02% (k-2)
Low Range	3.95663 ± 1.50% (k=2)	4.01886 ± 1.50% (k=2)	4.00468 ± 1.50% (k=2)

#### Connector Angle

١	Connector Angle to be used in DASY system	B4.0 * ± 1 "

Certificate No. DAE4-1260\_Aug14

Page 3 of 5

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Page: 196 of 319

## Appendix (Additional assessments outside the scope of SCS108)

High Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	190997,43	-0.04	-0.00
Channel X + Input	20003.49	2.49	0.01
Channel X - Input	-19998.62	2,32	-0.01
Channel Y + Input	199988.97	1.33	0,00
Channel Y - Input	20001.53	0.51	0.00
Channel Y - Input	-20000.52	0.34	-0.00
Channel Z + Input	199996,52	1.01	0.00
Channel Z + Input	19999.80	-1/21	-0.01
Channel Z - Input	-20001.65	-0.71	0.00

Low Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	2005,98	0.17	0.01
Channel X + Input	201.72	0.49	0,24
Channel X - Input	-198.19	0:50	-0.25
Channel Y + Input	1999.92	-1.02	0.05
Channel Y + input	201,16	-0.25	0.12
Channel V - Input	-198.53	0.05	-0.03
Channel Z + Input	2001.06	0.10	0.01
Channel Z + Input	200.04	-1.27	-0,53
Channel Z - Input	-200.02	-1.46	0.74

#### 2. Common mode sensitivity

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	1.17	-0,56
	- 200	1.57	-0.48
Channel Y	200	12.66	12,37
	200	13.46	-12.07
Channel Z	200	-0.46	-0.74
	- 200	-1.73	-1.63

#### 3. Channel separation

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200		5,89	A2.24
Channel Y	200	9,64	-	7.42
Channel Z	200	9,68	7.16	

Certificate No. DAE4-1260\_Aug14

Page 4 of 6.

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Page: 197 of 319

AD-Converter Values with inputs shorted

	High Range (LSB)	Low Range (LSB)
Channel X	15914	14950
Channel Y	15817	16075
Channel Z	16045	16582

#### 5. Input Offset Measurement

DASY measurement parameters: Autó Zéro Time: 3 suo; Measuring fimo; 3 sec.

	Average (μV)	min. Offset (uV)	max. Offset (μV)	Std. Deviation (µV)
Channel X	0.26	-0.78	1,42	0.43
Channel Y	-0.44	-1,36	0.61	0.43
Channel Z	-1,66	2.60	-0.69	0.44

#### 6. Input Offset Current

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

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	500

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

Typical values	Alarm Level (VDC)	
Supply (+ Vec)	+7.9	
Supply (* Vcc)	:7.8	

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (* Vcc)	+0.01	+6	-+14
Supply (- Vco)	-0.01	48	-8

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Page 5 of 5

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Page: 198 of 319

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Accrepted by the Switz Appropriation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accesso

Accreditation No.: SCS 108

CALIBRATION	CERTIFICATE		
Object	DAE4 - SD 000 D	04 BK - SN 915	
Calibration procedurate	QA CAL-06.v26 Calibration process	dure for the data acquisition electr	renics (DAE)
Calibration date:	June 18, 2014		
The measurements and the unco	emerius with certisence pe	and standards, which realize the physical sens modelly are given on the talkowing pages and	are part of the perfective.
	TE critical for calibration)	tacity: gharonman temperatore (22 ± 31°C;	and framidity < 10%.
manning Equipment used this			
Primary Standards	in e	Cas Date (Centrale No.)	Spreadured Calibration
	ID # SN: 0810278	Car Balle (Certificate No.) 01 Oct-13 (No.13976)	Scredued Calibration Oct-14
Primary Standards			
Primary Standards Kealtley Multimeen Type 2001	SN: 0810278 ID # SE UWS 050 AA 1001	01-Dut-13 (Nu:13076)	Od+14
Primary Standards Keithley Multimater Type 2001 Secondary Standards Auto DAE Daibration Link	SN: 0810278 ID # SE UWS 050 AA 1001	01-Out-13 (Nu:13976) Check Date (in house) 07-Jan-14 (in house check)	School and Check In house church, Jun-15
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Primary Standards Keifnley Muttimeter Type 2001 Secondary Standards Auto DAE Calibration Link	SN: 061027E  ID #  SE UWS 030 AA 1000 SE UMS 006 AA 1000	01-Out-13 (Nut-13976).  Check Data (in house).  07-Jan-14 (in house shuck).  07-Jan-14 (in mouse shuck).	Oct-14 Schedund Chrcs, In Joseph Chrcs, Jan-15 In Noise chark: Jan-15 In Noise chark: Jan-15

Certificate No: DAE4-915\_Jun14

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Page: 199 of 319

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Glossary

data acquisition electronics

Connector angle information used in DASY system to align probe sensor X to the robot

coordinate system.

#### Methods Applied and Interpretation of Parameters

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

Certificate No: DAE4-915 Jun14 Page 2 of 5

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Page: 200 of 319

#### DC Voltage Measurement

A/D - Converter Resolution nominal High Range: 1LSB =

full range = -100...+300 mV full range = -1......+3mV Low Range: 1LSB = 61nV. DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	z
High Range	404.307 ± 0.02% (k=2)	404.432 ± 0.02% (k=2)	404.778 ± 0.02% (k=2)
Low Range	3.97786 ± 1.50% (k=2)	4.00889 ± 1.50% (k=2)	3.98763 ± 1.50% (k=2)

#### Connector Angle

Connector Angle to be used in DASY system	115.0 ° ± 1 °

Certificate No: DAE4-915\_Jun14 Page 3 of 5

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Page: 201 of 319

#### Appendix (Additional assessments outside the scope of SCS108)

#### 1. DC Voltage Linearity

High Range	Reading (µV)	Difference (μV)	Error (%)
Channel X + Input	199998.08	1.14	0.00
Channel X + Input	20000.26	-0.79	-0.00
Channel X - Input	-19999.34	1.47	-0.01
Channel Y + Input	200000.17	3.04	0.00
Channel Y + Input	19999.35	-1.60	-0.01
Channel Y - Input	-20000.40	0.40	-0.00
Channel Z + Input	199996.89	-0.05	-0.00
Channel Z + Input	19999.67	-1.07	-0.01
Channel Z - Input	-20001.83	-0.82	0.00

Low Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	2000.78	-0.15	-0.01
Channel X + Input	201.37	-0.01	-0.00
Channel X - Input	-198.71	-0.07	0.04
Channel Y + Input	2001.08	0.23	0.01
Channel Y + Input	201.11	-0.04	-0.02
Channel Y - Input	-198.95	-0.16	0.08
Channel Z + Input	2000.69	-0.17	-0.01
Channel Z + Input	200.66	-0.48	-0.24
Channel Z - Input	-200.04	-1.33	0.67
nannei 2 - Input	-200.04	-1.33	0.

#### 2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-15.73	-17.62
	- 200	17.95	16.40
Channel Y	200	-5.63	-5.61
	- 200	4.75	4.70
Channel Z	200	-0.98	-1.03
	- 200	-0.88	-0.86

#### 3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (μV)
Channel X	200	- "	4.09	-3.56
Channel Y	200	7.89	-	5.02
Channel Z	200	8.61	6.69	

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Page 4 of 5

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Page: 202 of 319

## 4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16112	13093
Channel Y	15985	14777
Channel Z	1588-1	15729

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec Input  $10M\Omega$ 

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (µV)
Channel X	0.08	-1.17	1.32	0.43
Channel Y	-0.58	-1.57	0.70	0.47
Channel Z	-0.51	-1.47	1.80	0.44

#### 6. Input Offset Current

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

7. Input Resistance (Typical values for information)

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

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

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

9. Power Consumption (Typical values for information)

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

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Page: 203 of 319

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SGS - TW (Auden)

Accorditation No.: SCS 108

Certificate No. DAE4-856\_Aug14

## CALIBRATION CERTIFICATE DAE4 - SD 000 D04 BM - SN: 856 QA CAL-06.v26 Calibration procedure(s) Calibration procedure for the data acquisition electronics (DAE) Cartronios date. August 27, 2014 This patibation certificate documents the proceeding to national standards, which reside the physical units of measurements (3i). The insecurements 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 (PZ ± 3) To and humidity = 70%. Califination Equipment used (M&TE critical for calibration) Primary Standards ID:0 Car Date (Certificate No.) Scheduled Calibration Keitney Musimeler Type 2007 SN 0810278 Secondary Standards Auto DAE Calibration Unit Check Date (in Irousa) Scheduled Check SE UWS 053 AA 1001 07-Jan-14 (in house d'edu) In house check, Jan 15 Calibrator Box V2.1 SE LA/IS 005 AA 1002 07-Jan-14 (in house check) In house check: Jan-10 Tectvicies Deputy Technical Mirreger Fin Bomyon Approved by: This cultivation certificate shall not be reproduced except in full without written approval of the lapprapay

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Page 1 of 5

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Page: 204 of 319

Calibration Laboratory of Schmid & Partner

Schmid & Partner
Engineering AG
Zeushausstrasse 43, 9004 Zurich, Switzerland





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Accreditation No.: SCS 108

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#### Glossary

DAE data acquisition electronics

Connector angle information used in DASY system to align probe sensor X to the robot

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  - DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
  - Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
  - AD Converter Values with inputs shorted. Values on the internal AD converter corresponding to zero input voltage
  - Input Offset Measurement. Output voltage and statistical results over a large number of zero voltage measurements.
  - Input Offset Current: Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - Input resistance: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.
  - Power consumption: Typical value for information. Supply currents in various operating modes.

Certificate No: DAE4-666\_Aug14

Fagn 2 of 5

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Page: 205 of 319

## DC Voltage Measurement

A/D - Converter Resolution nominal

full range = -1.00,\_+300 mV full range = -1....+3mV High Range: 1LSB = B.THY. Low Range: 1LSB = 61nV ; DASY measurement parameters: Auto Zern Time: 3 sec; Measuring Ilmir: 3 sec

Calibration Factors	×	γ	2
High Range	403,468 ± 0.02% (4=2)	404.581 ± 0.02% (6+2)	403.903 ± 0.02% (k-2)
Low Range	3.97681 ± 1.50% (k-2)	3.97783 ± 1.50% (k=2)	3.97815 ± 1.50% (k+2)

#### Connector Angle

	_
Connector Angle to be used in DASY system	52.5 "±1"

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Page 5 of 6

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Page: 206 of 319

## Appendix (Additional assessments outside the scope of SCS108)

## 1. DC Voltage Linearity

High Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	19999933	0.84	0.00
Channel X + Input	19990.00	32.25	+0,01
Channel X - Input	20000.45	0.34	-0,00
Channel Y + Input	199999.95	0.96	0.00
Channel Y + Input	19997,51	-3.82	-0,02
Channal Y Input	-20000.77	0.07	-0,00
Channel Z + Input	199997.26	0.19	-0,00
Channel Z + Input	19997.65	-3.57	-0.02
Channel Z - Input	-20002.47	1.55	0.01

Low Bange	Heading (µV)	Difference (µV)	Error (%)
Channel X + Input	2001.05	-0.09	-0,00
Channel X + Input	202,34	0.60	0.40
Channel X - Input	-198.91	0.26	-0.13
Channel Y + Input	2001.39	0,26	0.01
Channel Y + Input	201.08	-0,36	0.18
Channel Y - Input	-199,24	-0.78	0,39
Channel Z + Input	2000.92	-0.16	-0.01
Channel Z + Input	200,26	-1.22	-0.60
Channel Z - Input	-199,91	+1:47	0.74

#### 2. Common mode sensitivity

	Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-14,76	-16.42
	-200	17,19	15,88
Channel Y	500	-2.17	7,25
	+200	0.30	.0.01
Channel Z	200	10.27	10,05
	-300	-13.06	-12.03

#### 3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel V (µV)	Channel Z (µV)
Channel X	200	- >1	2.81	-1.15
Channel Y	200	7.99		3:07
Channel Z	200	8.55	5.24	-

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Page: 207 of 319

## 4. AD-Converter Values with inputs shorted

	High Range (LSB)	Low Range (LSB)
Channel X	16226	16620
Channel Y	15942	16803
Channel 2	15875	16811

#### 5. Input Offset Measurement

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

	Average (μV)	min. Offset (µV)	max. Offset (µV)	Std. Deviation (µV)
Channel X	0.72	+0.77	1.89	0.38
Channel Y	-0.24	-1.07	1,89	0,42
Channel Z	-0.98	-2.01	0.07	0.40

#### 6. Input Offset Current

Nominal input circuity offset current on all channels «25tA

7. Input Resistance (Typical values for information)

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

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

Typical values	Alarm Level (VDC)	
Supply (+ Vcc)	+7.9	
Supply (- Vcc)	-7.0	

9. Power Consumption /Typics values for information

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0;01	-8	-9

Certificate No DAE4-856\_Aug14

Page 5 of 5

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Page: 208 of 319



nbei Road, Haidian District, Beijing, 100191. China 33-2079 Fax: «86-10-62304633-2504 Tel: +86-10-62304633-2079 E-mail: Inforcemente.com Http://www.emcite.com

Auden

#### Certificate No: Z14-97006 Client : **CALIBRATION CERTIFICATE** Object DAE3 - SN: 360 Calibration Procedure(s) TMC-OS-E-01-198 Calibration Procedure for the Data Acquisition Electronics Calibration date: February 17, 2014 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) to and Calibration Equipment used (M&TE critical for calibration) Primary Standards ID# Cal Date(Calibrated by, Certificate No.) Scheduled Calibration Documenting Process Calibrator 753 1971018 01-July-13 (TMC, No:JW13-049) July-14 Name Function Calibrated by: SAR Test Engineer Zhao Jing. Reviewed by: Qi Dianyuan SAR Project Leader Approved by: Deputy Director of the laboratory Lu Bingsong Issued: February 18, 2014 This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: Z14-97006 Page Lof 3

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Page: 209 of 319



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Glossary:

DAE

data acquisition electronics

Connector angle

information used in DASY system to align probe sensor X

to the robot coordinate system.

## Methods Applied and Interpretation of Parameters:

- DC Voltage Measurement. Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

Certificate No: Z14-97007

Page 2 of 3

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Page: 210 of 319



1 Collaboration with

# S D C A G

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#### DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1µV, full range = -100...+300 mV Low Range: 1LSB = 61nV, full range = -1......+3mV DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	x	Y	Z
High Range	404.198 ± 0.15% (k=2)	404.046 ± 0.15% (k=2)	404.074 ± 0.15% (k=2)
Low Range	3.93670 ± 0.7% (k=2)	3.93807 ± 0.7% (k=2)	3.97346 ± 0.7% (k=2)

#### Connector Angle

Connector Angle to be used in DASY system	223° ± 1 °	

Certificate No: Z14-97006

Page 3 of 3

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Page: 211 of 319

Calibration Laboratory of Schmid & Partner Engineering AG Zoughausstrasse 43, 8004 Zurich, Switzelland





Schweizenscher Kalibrierdiens; Service stilste d'étalormage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

Accepted by the owns Acceptation Service (BAE)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certification

cion

SGS-TW (Auden)

Galibration Equations used M&TE critical for calibrations

Certificate No.: EX3-3923\_Aug 14

# Calibration procedure(s) Calibration procedure(s) QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probles Calibration bate: August 28, 2014 This estimation conflicate documents materiablely to national standards, which realize the physical unite of measurements (S). The measurements and the uncertainties with confidence procedurity and given on the following pages and are part of the confidence. All contrations have been conducted in the closed lateratory facility, environment temperature (22 ± 3)°Q and (untility) < 70%.

Primary Standards	.0	Cat Date (Certificate No.)	Scheduled Calibration
Power minter E44198	GB41293874	03-Apr-14 (No. 217-01811)	Apr-15
Power serior E4412A	MY41498087	03-Apr:14 (No. 217-01911)	April 5
Reference 3 dft Attenuator	BN: 85064 (3u)	03-Apr-14 (No. 217-01915)	Apr:15
Reference 28 de Attenuator	SN: 85277 (20x)	113-Apr-14 (No. 217-01919)	Apr-15
Reference 30 oB Attempelor	SN. 85129 (30b)	II3-Apr-14 (No. 217-01920)	Apr.15
Reference Probe E83DV2	SM: 3013	30-Dec-13 (No. ESS-3013 Dec13)	Dec-14
DAE4	SN. 660	13-Dec-13 (No. DAE4-660_Dec/3)	Dec-14
Secondary Standards	10	Check Date (in house)	Scheduled Chick
RF generator HP 8648C	LIS3642U01700	4-Aug-99 (in house check Apr-13)	in house check. Apr-16
Network Ababzer HP 8753E	us37390589	18-Oct-01 (In house check Oct-13)	In house check: Oct-14

Calibrated by:

East E-you're Especially Factories September 1 Sep

Certificate No: EX3-3923 Aug 14

Page 1 of 11

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Page: 212 of 319

#### Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughteestrass 42, 800 Forter, Switzerland





S Schweizenscher Kalterennerst
C Service suisse d'étaionnige
Service syltzere di santium
Swas Californion Service

Acceptimise No.: SCS 108

Accredited by the Same Accredition Service (SAS)

The Swiss Accreditation Service is one of the signatories to the Ele Munitatoral Agmement for the recognition of calibration contributes

#### Glossary:

TSL taskie simulating liquid
NORMX,y.z sensitivity in free space
ConvF sensitivity in TSL / NORMX,y.z
DCP diode compression point

CF crest factor (1/duty\_cycle) of this RF signal A, B, C, D modulation dependent linearization parameters

Polarization in initiation around probe axis

Polarization is a repeat around an axis that is in the plane norms to probe sale (at measurement cambri),

i.e., ti = 0 is normal to proce axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

#### Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Minesurement Techniques", June 2013.
- Techniques", June 2013
  b) IEC 62209-1, "Procedure to measure the Specific Atsorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)". Fabruary 2005

#### Methods Applied and Interpretation of Parameters:

- NORMx, y,z: Assessed for E-field polarization 8 = 6 (f = 100 MHz in TEM-call; f > 1800 MHz, R22 waveguide).
   NORMx, y,z are only intermediate values, i.e., the uncertainties of NORMx, y,z does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConVF).
- NORM(f)x,y,z = NCRMx,y,z \* frequency\_response (see Frequency Response Charl). This linearization is implemented in DASY4 software varsions later than 4.2. The uncertainty of the frequency response ≼ included in the stated uncertainty of ConvF.
- DCPx.y,z: CCP are numerical linearization parameters assessed based on the data of power awasp with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak in Average Ratio that is not calibrated but determined based on the signal characteristics.
- As, y.z. Bs, y.z. Cs, y.z. Ds, y.z. VRx, y.z. A. B. C. D an numerical invariantion parameters assessed based on the data of power sweet 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 tilode.
- ConvF and Boundary Effect Parameters. Assessed in flat phantom using E-field (or Temperature Transfer
  Standard for t ≤ 800 MHz) and inside wavegude using analytical field distributions based on power
  measurements for t > 800 MHz. The same setups are used for assessment of the parameters applied for
  boundary companisation (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 MORMs, 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 (20 deviation from isotropy), it is field of low gradients resilized using a flat phantom exposed by a patch unternia.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No loterance required.
- Connector Angle: The angle is assessed using the Information gained by determining the NORMx (no. uncertainty required).

Fernican No. EX3-3924 Aug 14

Page Z of 11

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Page: 213 of 319

EX 10VA - SVLTVE

7800006-20 -501to

# Probe EX3DV4

SN:3923

Manufactured; Calibrated: March 8, 2013 August 28, 2014

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

Contificate No: EX343923\_Aug14

Page 2.6111

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Page: 214 of 319

EX3DVA-5N 3973

- Avignet set 2014

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3923

#### Basic Calibration Parameters

	Sensor	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m)*)*	0.58	0.48	0.47	±10,1%
DCP (mV)"	99.2	102.2	103.3	

UID	Communication System Name		A tilli	B dBõV	C	dB	WR mV	Unc (k=Z)
0	CW	X	0.0	0.0	1.0	0.00	132.9	43.0 %
		Y	0.0	0.0	1.0		134 B	
		2	0.0	0.0	1.0		135 ()	

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%.

Certificate No. EX3-3923\_Aug14

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The uncertainties of MormX,Y,Z do not wheat the E field undertainty make TEL (see Page 5 4nd 5) formers of mentination parameter uncertainty our required. Or entainty to community make the rest is not useful and useful undertainty to community and the rest of the rest o



Page: 215 of 319

Avgust 20, 2014 EX30V4 SN:3923

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3923

#### Calibration Parameter Determined in Head Tissue Simulating Media

r (MHz) <sup>©</sup>	Relative Permittivity	Conductivity (Sim)	ConvF X	ConvF Y	ConvF Z	Alphé 9	Depth <sup>G</sup> (mm)	Unct. (k=2)
750	41,9	0:89	10.91	10.91	10.91	0.25	1.16	± 12.0 %
835	41.5	0.90	10.48	10.48	10.48	0.27	1.07	± 12.0 W
900	41.5	0.97	10.26	10.25	10.26	0.17	1.53	± 12-0.%
1750	40.1	1.37	8.72	B;72	8.72	0.75	0.57	± 12.0 %
1900	40.0	1.40	3.42	8.42	8.42	0.45	0.77	±12.09
2000	40.0	1.40	8.46	5.46	8.46	0,67	0.63	± 12.0 %
2300	39.5	1.67	B.02	5.02	B.02	0.35	0.85	±1209
2450	39.2	1.80	7.66	7,66	7,66	0.33	0.87	112.03
2600	39.0	1.96	7.41	7.41	7.41	0.35	0.86	±12.05
5200	36.0	4.68	5.17	5.17	5.17	0.35	1.80	+13.13
5300	35.9	4.76	4.99	4.99	4.99	0.35	1,80	±13.19
5800	35.5	5.07	4.71	4.71	4.71	0.40	1.80	±13.19
5600	35.3	5.27	4.67	4.67	4.67	0.40	1.80	± 13.1 %

<sup>&</sup>lt;sup>6</sup> Frequency weldily above 300 MHz of a 100 MHz only applies to CASY 44 and higher (see Page 2), vice 4 is restricted to a 50 MHz. The uncertainty is the RSS of the Cornel uncertainty at celebration frequency and the uncertainty to the ordinated frequency welday better 500 MHz (a.1.0...25, 40, 50 and 70 MHz (b.). Some secondard to 200 MHz (b.). Above 5 GHz requency validity can be exceeded to 110 MHz.
\*A frequencies better 3 CPS, the validity of feature currentless (c.) and be retained for 110 MHz.
\*A frequencies better 3 CPS, the validity of feature currentless (c.) and be retained for 110 MHz.

Certocate No. EX3-3921, Aug 14

Page 5 of 11

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Page: 216 of 319

E330V4- SN:3022

August 28, 2014

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3923

#### Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) E	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvFY	ConvF 2	Alphu "	Depth to (mm)	Unct. (k=2)
750	55.5	0.96	10.29	10.29	10.29	0.30	1.04	± 12.0.%
635	55.2	0.97	10.32	10.32	10.32	0.55	0.78	± 12.0 %
900	55,0	1,05	10.04	10.04	10.04	0.44	0.88	± 12.0 %
1750	53.4	1.49	8.30	8.30	8,30	0.39	0.85	± 12.01
1900	53,8	1,52	8.03	B 03	8.03	0.30	0.95	± 12.09
2000	53,3	1.52	8.16	B.16	8.16	0.23	116	± 12.09
2300	62.9	1.01	7.76	7.76	7.76	0.44	0.77	± 12,0 9
2450	52.7	1.95	7.58	7.56	7.56	0.80	0.50	± 12.0 9
2600	52.5	216	7.36	7,36	7.36	0.80	0.50	± 12.0 9
5200	49.0	5,30	4.71	4.71	4.71	0.35	1.90	± 13.1 %
5300	48,9	5.42	4.58	4,58	4.58	0.35	1.90	213.13
5600	48.5	5.77	4.09	4.09	4:09	-0.4D	1.00	±13.19
5800	48.2	6.00	4.33	4,33	4:33	0.40	1.90	2 13.13

Finguously validity above 380 MHz of ± 107 MHz only applied for DAGY vid a and higher [see Page 2], should be asserted to ± 50 MHz. The uncertainty is the HSS of the Count uncertainty at contrastion begans and the uncertainty for the indicated frequency band. Finguestry saidity below 360 MHz or ± 10, 25, 40, 50 and 70 MHz by Count asserted at 30, 54, 128, 150 and 200 MHz or page of key. Above 5 GHz begans or yaidity can be exceeded to ± 110 MHz.

All frequences below 3 GHz, the validity of issue parameters (a amile) can be released to ± 10% 1 input compression formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of issue parameters.

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Certificate No. EX3-3923\_Aug 14

Page 6 of 11

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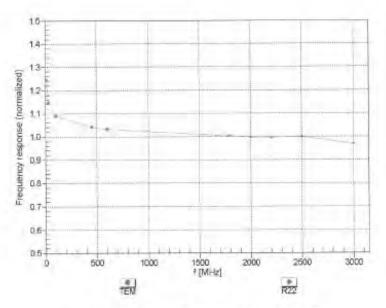
Page: 217 of 319

EX3DV4- SN:3923

August 28, 2014

# Frequency Response of E-Field

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



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

Certificate No: EX3-3923\_Aug/14

Page 7 of 11

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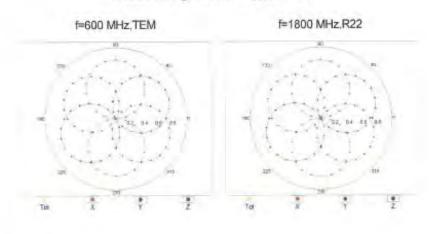
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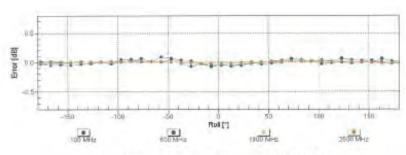


Page: 218 of 319

August 28, 2014 EX3DV4-SN:3923

# Receiving Pattern (6), 9 = 0°





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

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Page 8 of 11

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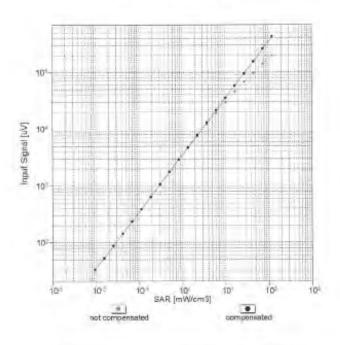
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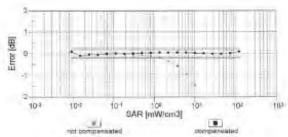


Page: 219 of 319

August 28, 2014 EX3DV4- SN:3923

# Dynamic Range f(SAR<sub>head</sub>) (TEM cell , feval= 1900 MHz)





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

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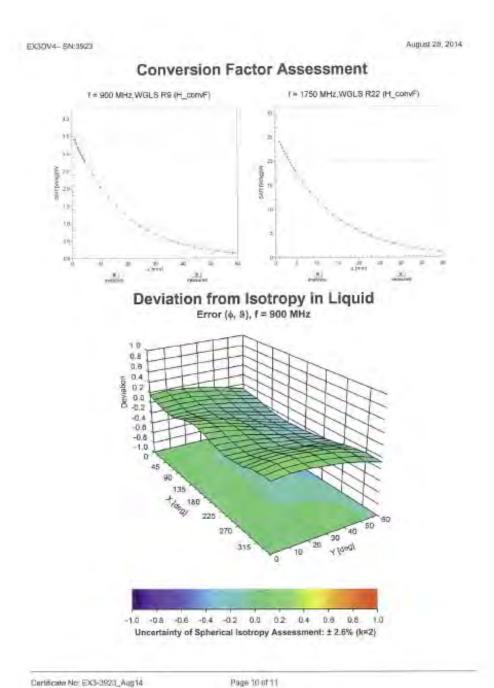
Page 9 of 11

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Page: 220 of 319



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Page: 221 of 319

EXCDV4\_8N:3923

August 28, 2016

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3923

#### Other Probe Parameters

Sensor Arrangament	Triangular
Connector Angle (*)	-57
Mechanical Surface Delection Mode	anabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 cmm
Tip Length	2 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	7 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Messurement Distance from Surface	1.4 wm

Certificate No. EX3-3825, Aug 14

Page 11 rd 11

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Page: 222 of 319

Calibration Laboratory of Schmid & Partner Engineering AG ougharastrasss 43,8004 Zonon. Switterland





Schweizerischer Kalibrierdienes Service suisse d'étalonnage Servizio evizzaro di torattica

Accrecised by the Swiss Accrecitation Service (SA6) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of chibration certificates

SGS-TW (Auden)

Acceptation No.: SCS 108

C

Certificate No. EX3-3831\_Jan14 CALIBRATION CERTIFICATE EX3DV4 - SN:3831 Cateration procedured QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for desimetric E-field probes Carrygion date: January 31, 2014 The callendar certificate documents the succeptility or national statistics, which replice the physical and of measurements (5) The measurements and the unconsenter with confidence outliability are given on the following pages and are part of the cardicale All calibrations have been conducted in the closed laboratory facility, environment temperature (22 ± 3)°C and hamiday = 10% Calibration Equipment used (MS/TE critical for calibration) Primary Standards Cal Date (Certificate No.) Scheduled Calibration Power meter E4410B C841200674 84-Apr-13 (No. 217-01733) April 14 Phwer sensor E4412A MY43498087 B4-Apr-13 (No. 217-01733) April4 Reference 3 dB Attenuator SN \$5054 (3c) D4-Acr-13 (No. 237-01237) Apr. 14 Reference 20 dB Attanuation SN: \$5277 (20x) 04-Apr-13 (No. 217-01735) Apr-14 Reference 30 dB Attenueror SN: \$5129 (30b) B4-Apr-13 (No. 217-01738) Apr-14 Reference Prese ES3DV2 SN: 3013 36-Dec-13 (No. ES3-3013 Dec/3) Day-10 DAE4 उर छहा 13-Dec-13 (No. DAEA (RID), Dec13) Dac-14 Secondary Standards ID. Check Dale (in house) Screduled Check RF generato: HP 88490 US3642LIG1700 4-Aug-99 (In trause sheek Apr-13) In house check: Apr-16 Neiwork Anaryon HP 67535 115/2/24/0885 18-Oct-01 (in human streets Oct-13). In house check: Dig-14 Non Estable Laboratory Technician anoveres Kata Pakono Technical Manager Issued January 31, 2014 This collection certificate shall led be recordinate average in full without written approve in the laboratory.

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Page 1 of 11

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Page: 223 of 319

#### Calibration Laboratory of

Schmid & Partner Engineering AG oughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service suisse d'étalons С Servizio svizzero di taratura

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signaturies to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

tissue simulating liquid NORMx,y,z sensitivity in free space sensitivity in TSL / NORMx,y,z ConvF DCP diode compression point

crest factor (1/duty\_cycle) of the RF signal modulation dependent linearization parameters A, B, C, D

Polarization @ o rotation around probe axis

Polarization 9 a rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 0 is normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

- Calibration is Performed According to the Following Standards:

  a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement
  - Techniques", June 2013
    IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

#### Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization  $\theta = 0$  (f  $\leq 900$  MHz in TEM-cell; f  $\geq 1800$  MHz: R22 wavegu NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- $NORM(f)x,y,z = NORMx,y,z * frequency_response$  (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor medi
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z; A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f < 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters applied for used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm$  50 MHz to  $\pm$  100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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Page: 224 of 319

EX3DV4 -- SN:3831

January 31, 2014

# Probe EX3DV4

SN:3831

Manufactured: Calibrated:

September 6, 2011 January 31, 2014

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

Certificate No: EX3-3831\_Jan14

Page 3 of 11

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Page: 225 of 319

EX3DV4-- SN:3831

January 31, 2014

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

#### **Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m) <sup>2</sup> ) <sup>A</sup>	0.45	0.42	0.43	± 10.1 %
DCP (mV) <sup>B</sup>	102.4	100.1	97.7	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc <sup>t</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	153.1	±3.0 %
		_ Y	0.0	0.0	1.0		146.3	
		Z	0.0	0.0	1.0		154.8	

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%.

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Page 4 of 11

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A The uncertainfies of NormX,Y,Z do not affect the E<sup>1</sup>-field uncertainty inside TSL (see Pages 5 and 6).

Numerical Innonization parameter: uncertainty not required.

Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the equare of the field value.



Page: 226 of 319

EX3DV4-SN:3831

January 31, 2014

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

#### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>6</sup>	Depth <sup>G</sup> (mm)	Unct. (k=2)
750	41.9	0.89	9.59	9.59	9.59	0.74	0.84	± 12.0 %
835	41.5	0.90	9.14	9.14	9.14	0.22	1.36	± 12.0 %
900	41.5	0.97	9.17	9.17	9.17	0.28	0.96	± 12.0 %
1750	40.1	1.37	8.00	8.00	8.00	0.26	0.99	± 12.0 %
1900	40.0	1.40	7.79	7.79	7.79	0.60	0.65	± 12.0 %
2000	40.0	1.40	7.71	7.71	7.71	0.39	0.79	± 12.0 %
2300	39.5	1.67_	7.35	7.35	7.35	0.43	0.76	± 12.0 %
2450	39.2	1.80	6.99	6.99	6.99	0.37	0.85	± 12.0 %
2600	39.0	1.96	6.62	6.62	6.62	0.38	0.87	± 12.0 %
5200	36,0	4.66	4.67	4.67	4.67	0.35	1.80	± 13.1 %
5300	35.9	4.76	4.41	4.41	4.41	0.40	1.80	± 13.1 %
5600	35.5	5.07	3.99	3.99	3.99	0.50	1.80	± 13.1 %
5800	35.3	5.27	4.12	4.12	4.12	0.45	1.80	± 13.1 %

Certificate No: EX3-3831\_Jan14

Page 5 of 11

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<sup>&</sup>lt;sup>6</sup> Frequency validity of ± 100 MHz cirtly applies for DASY v4.4 and higher (see Page 2), also it is restricted to ± 50 MHz. The uncertainty is the RSS of the Corner uncertainty at cellbration frequency and the uncertainty for the indicated frequency band.

\*At frequencies below 3 GHz, the validity of tissue parameters (a and a) can be released to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of issue parameters (a and a) is restricted to ± 5%. The uncertainty is the RSS of the Corner uncertainty for indicated target issue parameters.

\*AphatDepth 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 at any distance larger than half the probe tip dismeter from the boundary.



Page: 227 of 319

EX3DV4-- SN:3831

January 31, 2014

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

#### Calibration Parameter Determined in Body Tissue Simulating Media

Cambradon	anibration Parameter Determined in Body Tissue Simulating Media										
f (MHz) <sup>c</sup>	Relative Permittivity*	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>5</sup>	Depth <sup>G</sup> (mm)	Unct. (k=2)			
750	55.5	0.96	9.10	9.10	9.10	0.50	0.80	± 12.0 %			
835	55.2	0.97	9.03	9.03	9.03	0.28	1.15	± 12.0 %			
900	55.0	1.05	8.84	8.84	8.84	0.29	1.08	± 12.0 %			
1750	53.4	1.49	7.63	7.63	7.63	0.26	1.16	± 12.0 %			
1900	53.3	1.52	7.19	7.19	7.19	0.32	1.01	± 12.0 %			
2000	53.3	1.52	7.17	7.17	7.17	0.44	0.83	± 12.0 %			
2300	52,9	1.81	6.90	6.90	6.90	0.52	0.76	± 12.0 %			
2450	52.7	1.95	6.68	6.68	6.68	0.80	0.56	± 12.0 %			
2600	52.5	2.16	6.50	6.50	6.50	0.80	0.50	± 12.0 %			
5200	49.0	5.30	4.08	4.08	4.08	0.50	1.90	± 13.1 %			
5300	48.9	5.42	3.87	3.87	3.87	0.50	1.90	± 13.1 %			
5600	48.5	5.77	3.36	3.36	3.36	0.60	1.90	± 13.1 %			
5800	48.2	6.00	3.78	3.78	3.78	0.55	1.90	± 13.1 %			

Certificate No: EX3-3831\_Jan14

Page 6 of 11

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<sup>&</sup>lt;sup>0</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), clase it is asstricted to ± 50 MHz. The uncertainty is the RS3 of the Cornel' uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

\*At frequencies below 3 GHz, the validity of tissue parameters (a and e) can be released to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (a and e) is restricted to ± 6%. The uncertainty is the RSS of the ConvF uncertainty for indicated target issue parameters.

\*Application and the 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.



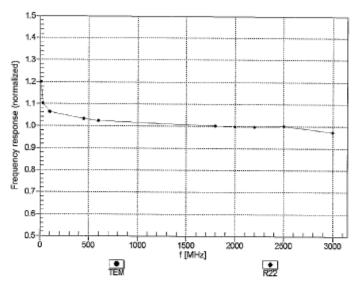
January 31, 2014

Page: 228 of 319

EX3DV4-SN:3831

# Frequency Response of E-Field

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



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

Certificate No: EX3-3831\_Jan14 Page 7 of 11

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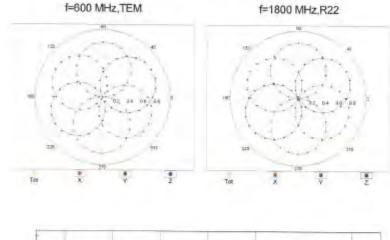


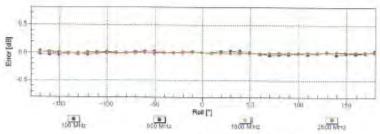
Page: 229 of 319

EX3DV4- SN:3831

January 31, 2014

# Receiving Pattern (6), 9 = 0°





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

Certificate No: EX3-3831\_Jan14

Page 8 of 11

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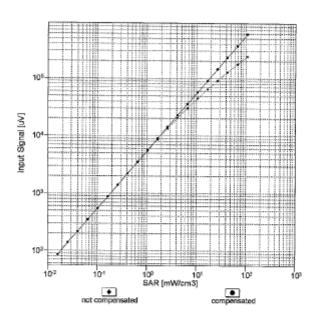


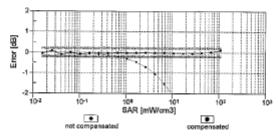
Page: 230 of 319

EX3DV4- SN:3831

January 31, 2014

### Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f = 900 MHz)





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

Certificate No: EX3-3831\_Jan14

Page 9 of 11

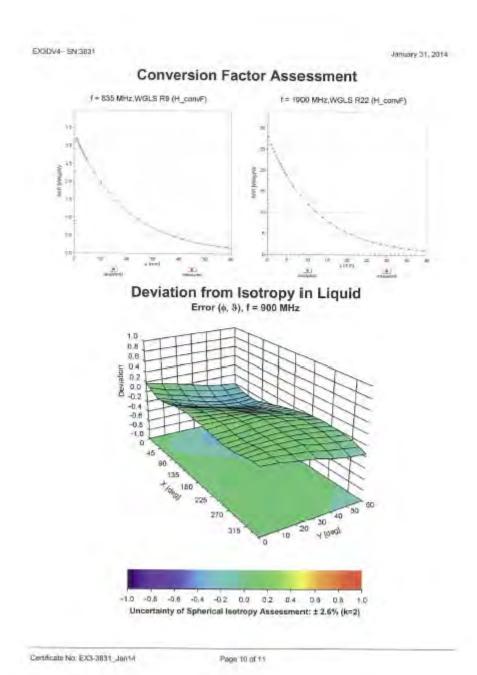
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Page: 231 of 319



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Page: 232 of 319

EX3DV4-- \$N:3831

January 31, 2014

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

#### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (*)	-20.6
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	2 mm

Certificate No: EX3-3531\_Jan14

Page 11 of 11

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Page: 233 of 319

Calibration Laboratory of Schmid & Partner

Scrimic & Partner
Engineering AG
Zeughausstrasse 43, 8864 Zurich, Switterland





Schweiberscher Kalibnerdienst Service suitee d'étalonnage Servizio setzero di tarature Swise Calibration Service

Accretized by the Swess Accretization Service (SAS)
The Swiss Accretization Service is one of the algoritories to she EA
Multilateral Agreement for the recognition of calibration certificative

Caltration Explorest used (M&TE critical for calibration)

Client SGS-TW (Auden)

Accreditation No.: SCS 108

Certificate No. EX3-3938 Jul 14

CALIBRATION CERTIFICATE

Dispersion procedures | EX3DV4 - SN:3958 |

Generation procedures | GA GAL-01.79, QA GAL-14.74, VI. QA GAL-25.75, QA GAL-25.76 |

Calibration procedures for desimetric E-field probes |

Calibration certificate documents the traceability on national statements, which relates the physical units of measurements (81). The measurements and the incertainties with confidence probability are given on the following pages and are pain of the certification. At calibrations have been conducted in the classed information territory environment immigrations (22 ± 3) C and harmony < 70%

Primary Standards	(0)	Call Core (Cartificate Mo.)	Scheduled Calibration
Power maler E4415E	GB41293874	03-Apr-14 (No. 217-81911)	April .
Power sensor E4412A	MY41498887	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: 55094 (3c)	03-Apr-14 (No. 217-01915)	Apx+10:
Rejelence 20 dB Attenuator	SN 56277 (20x)	03-Apr-14 (No. 217-01919)	Apr 15
Furmanca 30 dB Abumultor	SN: 55179 (Mb)	03-Apr-14 (No. 217-01920)	Apr-11
Reference Prope ES30V2	SN 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec:14
DAE4	BN: 660	13-Dec-13 (No. DAE4-860_Dec13)	Dec-14
Secondary Standards	(0	Check Dain (in house)	Scheduled Check
RF generator HP 86480.	US3642U01700	#-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8750E	US3/399580	15-Oct-01 (in house check Gizt-13)	in house check. Dick-14

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Certificate No: EX3-3938\_Jul14

Page 1 of 11

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Page: 234 of 319

#### Calibration Laboratory of

Schmid & Partner Engineering AG





Service suisse d'étalonnage C Servizio svizzero di taratura

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signal Multilateral Agreement for the recognition of calibration certificates

#### Glossary:

tissue simulating liquid NORMx,y,z sensitivity in free spa sensitivity in TSL / NORMx,y,z DCP

diode compression point crest factor (1/duty\_cycle) of the RF signal modulation dependent linearization parameters A, B, C, D

Polarization φ φ rotation around probe axis

Polarization 9 9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e.,  $\theta$  = 0 is normal to probe axis information used in DASY system to align probe sensor X to the robot coordinate system Connector Angle

#### 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

Techniquee\*, June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

#### Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f < 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe securacy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z \* CanvF 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
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: EX3-3938\_Jul14

Page 2 of 11

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Page: 235 of 319

July 25, 2014 EX3DV4 -- SN:3938

# Probe EX3DV4

SN:3938

Manufactured: Calibrated:

May 2, 2013 July 25, 2014

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: EX3-3938 Jul 14 Page 3 of 11

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Page: 236 of 319

EX3DV4-- SN:3938

July 25, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

#### **Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m) <sup>2</sup> ) <sup>A</sup>	0.52	0.59	0.34	± 10.1 %
DCP (mV) <sup>6</sup>	98.3	99.4	104.7	

#### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc <sup>E</sup> (k=2)
0	CW	Х	0.0	0.0	1.0	0.00	166.6	±3.0 %
		Y	0.0	0.0	1.0		157.7	
		Z	0.0	0.0	1.0		153.7	

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%.

Certificate No: EX3-3938\_Jul14

Page 4 of 11

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The uncertainties of NormX,Y,Z do not affect the IE<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

Numerical linearization parameter: uncertainty not required.

Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the



Page: 237 of 319

EX3DV4-SN:3938

July 25, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

#### Calibration Parameter Determined in Head Tissue Simulating Media

ampration	inbration Parameter Determined in nead Tissue Simulating Media										
f (MHz) <sup>G</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>G</sup> (mm)	Unct. (k=2)			
835	41.5	0.90	9.41	9.41	9.41	0.80	0.50	± 12.0 %			
900	41.5	0.97	9.26	9.26	9.26	0.61	0.68	± 12.0 %			
1750	40.1	1.37	7.91	7.91	7.91	0.59	0.66	± 12.0 %			
1900	40.0	1.40	7.65	7.65	7.65	0.54	0.72	± 12.0 %			
2000	40.0	1.40	7.66	7.66	7.66	0.80	0.59	± 12.0 %			
2450	39.2	1.80	6.97	6.97	6.97	0.41	0.78	± 12.0 %			
2600	39.0	1.96	6.83	6.83	6.83	0.38	0.86	± 12.0 %			
5200	36.0	4.66	4.95	4.95	4.95	0.40	1.80	± 13.1 %			
5300	35.9	4.76	4.74	4.74	4.74	0.40	1.80	± 13.1 %			
5600	35.5	5.07	4.47	4.47	4.47	0.40	1.80	± 13.1 %			
5800	35.3	5.27	4.49	4.49	4.49	0.40	1.80	± 13.1 %			

<sup>&</sup>lt;sup>C</sup> 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 estituation 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 ± 10 MHz.

<sup>f</sup> At frequencies below 3 GHz, the validity of tissue parameters (s and o) can be released to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (s and o) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target Issue parameters.

<sup>g</sup> Apha/Depth are determined during cationation. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always lass than ± 1% for frequencies below 3 GHz and balow ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip clameter from the boundary.

Certificate No: EX3-3938\_Jul14

Page 5 of 11

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Page: 238 of 319

EX3DV4-SN:3938

July 25, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

#### Calibration Parameter Determined in Body Tissue Simulating Media

ambration	alibration Farameter Determined in Body Tissue Simulating Media									
f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>6</sup>	Depth <sup>G</sup> (mm)	Unct. (k=2)		
835	55.2	0.97	9.35	9.35	9.35	0.80	0.60	± 12.0 %		
900	55.0	1.05	9.24	9.24	9.24	0.80	0.50	± 12.0 %		
1750	53.4	1.49	7.36	7.36	7.36	0.80	0.62	± 12.0 %		
1900	53.3	1.52	7.03	7.03	7.03	0.44	0.83	± 12.0 %		
2000	53.3	1.52	7.21	7.21	7.21	0.30	0.97	± 12.0 %		
2450	52.7	1.95	6.69	6.69	6.69	0.75	0.57	± 12.0 %		
2600	52.5	2.16	6.57	6.57	6.57	0.80	0.50	± 12.0 %		
5200	49.0	5.30	4.27	4.27	4.27	0.45	1.90_	±13.1 %		
5300	48.9	5.42	4.11	4.11	4.11	0.45	1.90	± 13.1 %		
5600	48.5	5.77	3.70	3.70	3.70	0.50	1.90	± 13.1 %		
5800	48.2	6.00	3.92	3.92	3.92	0.50	1.90	± 13.1 %		

<sup>&</sup>lt;sup>o</sup> 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, 23, 46, 90 and 70 MHz for ConvF assessments at 30, 84, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.
\*At frequencies below 3 GHz, the validity of tissue parameters (s and e) can be relaxed to ± 10% if figuid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (s and e) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target issue parameters.
A physiCepth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always liess 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 dismeter from the boundary.

Certificate No: EX3-3938\_Jul14 Page 6 of 11

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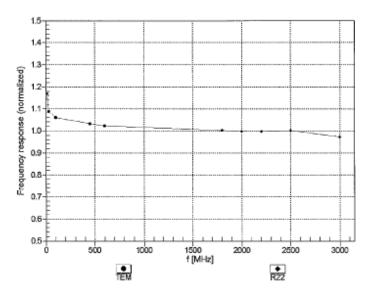
Page: 239 of 319

EX3DV4-- SN:3938

July 25, 2014

# Frequency Response of E-Field

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



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

Certificate No: EX3-3938\_Jul14

Page 7 of 11

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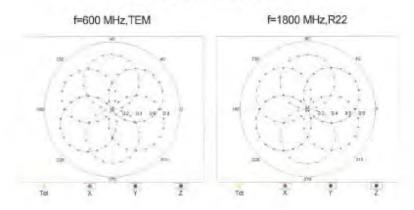
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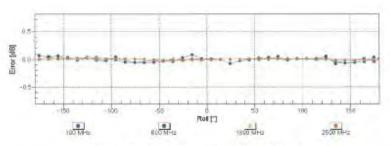


Page: 240 of 319

EX3DV4- SN:3938 July 25, 2014

# Receiving Pattern (6), 9 = 0°





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

Certificate No: EX3-3938\_Jul 14

Page 6 of 11

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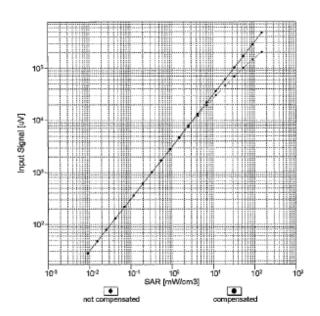
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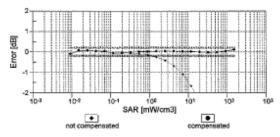


Page: 241 of 319

EX3DV4- SN:3938 July 25, 2014

### Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f<sub>eval</sub>= 1900 MHz)





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

Page 9 of 11

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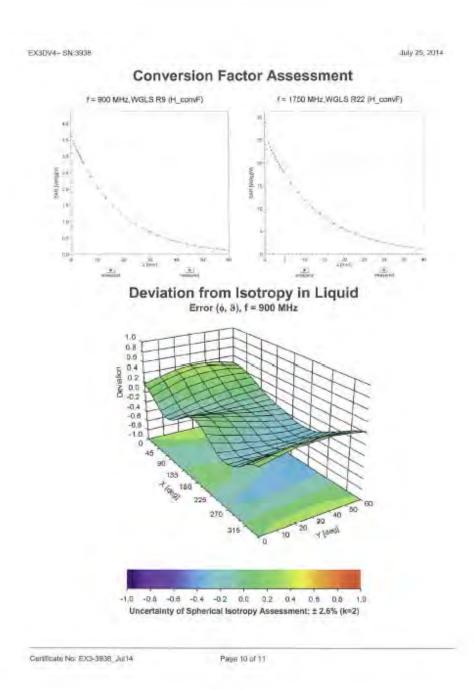
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Page: 243 of 319

EX3DV4- SN:3938 July 25, 2014

### DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

#### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (*)	-25.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Certificate No: EX3-3938\_Jul14 Page 11 of 11

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Schweizerischer Kallbrierdin Service suisse d'étalunnage Servizio evizzero di taratura Swiss Calibration Service

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SGS-TW (Auden)

Cereficate No: EX3-3770 April

CALIBRATION CERTIFICATE EX3DV4 - SN:3770 Object QA CAL 01.V9, QA CAL-14.V4: QA CAL-23.V5, QA CAL-25.V6 Calibration procedurated Calibration procedure for cosmetric E-field probes April 24, 2014 Calibration date This paids also perfileate documents the tracestrify to national standards, which reutize the physical units of meass The recognitionals and the uncertainties with confidence probability will given on the following pages and are part of the perfican All calibrations have been constituted in the closed substatory facility environment temperature (22 ± 3)/13 and numetry = 78%. Calibration Equipment used IMATE critical for calibration)

Primary Standards	iti	(Call Date (Cadificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	E3-Agr-14 (No. 217-01911)	Asr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 cB Alternation	SN: 36054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: 36277 (204)	03-Apr-14 (No. 217-01619)	Apr-15
Raterance 30 cB Abenuator	SN: S5129 (30b)	(CS-Apri-14 (No. 217-01920)	April 15
Reterence Probe ES30V2	EN: 3013	30-Den-13 (No. ES3-3013_Dec13)	Dec-14
DAEI	5N 680	13 Dec-13 (No. DIAE4 660, Dec13)	Dec-14
Secondary Standards	(13)	Check Date (in house)	Scheduled Check
HF generator HP 8848C	US3642U01700	4-Aug-99 (in house check Apr-13).	try frogser check: Apr-15
Network Analyzer HP 8753E	US37990560	18-Oct-01 (in house check Col-13)	in house check: Oct-14

Name	Fuertion	Signiture
Jelon Kastreli	Laborary Technique	FILE
Kaya Polmin	Technical Manager	JERY.
		Issued, April 24, 2014
	Jeion Kastrali	Jeich Kastreli Jahra Kurry Teormogau.

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Page 1.0f 11

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Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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# Glossary:

tissue simulating liquid NORMx,y,z sensitivity in free space sensitivity in TSL / NORMx,y,z DCP diode compression point

crest factor (1/duty\_cycle) of the RF signal A, B, C, D modulation dependent linearization parameters

Polarization φ o rotation around probe axis

9 rotation around an axis that is in the plane normal to probe axis (at measurement center), Polarization 9

i.e., 9 = 0 is normal to probe axis information used in DASY system to align probe sensor X to the robot coordinate system Connector Angle

#### 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

#### Methods Applied and Interpretation of Parameters:

- WORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)x,y,z = NORMx,y,z \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f s 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: EX3-3770\_Apr14

Page 2 of 11

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Page: 246 of 319

EX3DV4 - SN:3770

April 24, 2014

# Probe EX3DV4

SN:3770

Manufactured: Calibrated:

July 6, 2010 April 24, 2014

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

Certificate No: EX3-3770\_Apr14

Page 3 of 11

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April 24, 2014

Page: 247 of 319

EX3DV4-SN:3770

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

#### **Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)	
Norm (µV/(V/m) <sup>2</sup> ) <sup>A</sup>	0.31	0.61	0.40	± 10.1 %	
DCP (mV) <sup>th</sup>	104.0	96.9	102.5		

#### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc <sup>ll</sup> (k=2)
0	CW	×	0.0	0.0	1.0	0.00	141.8	±3.5 %
		Y	0.0	0.0	1.0		132.9	
		Z	0.0	0.0	1.0		135.7	

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%.

Certificate No: EX3-3770\_Apr14

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Page 4 of 11

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<sup>&</sup>lt;sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 6 and 6).

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

<sup>a</sup> Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



Page: 248 of 319

April 24, 2014 EX3DV4-SN:3770

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

#### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha <sup>6</sup>	Depth <sup>6</sup> (mm)	Unct. (k=2)
750	41.9	0.89	9.70	9.70	9.70	0.27	1.09	± 12.0 %
835	41.5	0.90	9.32	9.32	9.32	0.52	0.77	± 12.0 %
900	41.5	0.97	9.16	9.16	9.16	0.14	1.68	± 12.0 %
1750	40.1	1.37	8.08	8.08	8.08	0.28	0.92	± 12.0 %
1900	40.0	1.40	7.79	7.79	7.79	0.36	0.81	± 12.0 %
2000	40.0	1.40	7.75	7.75	7.75	0.40	0.78	± 12.0 %
2300	39.5	1.67	7.35	7.35	7.35	0.26	0.95	± 12.0 %
2450	39.2	1.80	6.97	6.97	6.97	0.35	0.82	± 12.0 %
2600	39.0	1.96	6.73	6.73	6.73	0.45	0.73	± 12.0 %
5200	36.0	4.66	5.25	5.25	5.25	0.35	1.80	± 13.1 %
5300	35.9	4.76	5.07	5.07	5.07	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.48	4.48	4.48	0.45	1.80	± 13.1 %
5800	35.3	5.27	4.65	4.65	4.65	0.45	1.80	± 13.1 %

Certificate No: EX3-3770\_Apr14 Page 5 of 11

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Frequency validity of a 100 MHz only applies for DASY w.4.4 and higher (see Page 2), also it is restricted to ± 60 MHz. The uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

At frequencies below 3 GHz, the validity of tissue parameters (a and o) can be released to ± 10% if liquid compensation formats is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (a and o) is restricted to ± 5%. The uncertainty is the RSS of the ConvE uncertainty is indicated traper tissue parameters, is and o) is restricted to ± 5%. The uncertainty is the RSS of the ConvE uncertainty is indicated traper tissue parameters, is and o) is restricted to ± 5%. The uncertainty is the RSS of the ConvE uncertainty is indicated traper tissue parameters, is and o) is restricted to ± 5%. The uncertainty is the RSS of the ConvE uncertainty is the RSS of the RSS of the ConvE uncertainty is the RSS of the RSS of the ConvE uncertainty is the RSS of the RSS of the ConvE uncertainty is the RSS of the R



Page: 249 of 319

EX3DV4- SN:3770

April 24, 2014

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

#### Calibration Parameter Determined in Body Tissue Simulating Media

alibration Parameter Determined in Body Tissue Simulating Media								
f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>0</sup>	Depth <sup>6</sup> (mm)	Unct. (k=2)
750	55,5	0.96	9.54	9.54	9.54	0.53	0.79	± 12.0 %
835	55.2	0.97	9.40	9.40	9.40	0.19	1.60	± 12.0 %
900	55.0	1.05	9.23	9.23	9.23	0.27	1.20	± 12.0 %
1750	53.4	1.49	7.79	7.79	7.79	0.37	0.87	± 12.0 %
1900	53.3	1.52	7.51	7.51	7.51	0.47	0.78	± 12.0 %
2000	53.3	1.52	7.59	7.59	7.59	0.61	0.69	± 12.0 %
2300	52.9	1.81	7.27	7.27	7.27	0.60	0.69	± 12.0 %
2450	52.7	1.95	7.15	7.15	7.15	0.52	0.72	± 12.0 %
2600	52.5	2.16	6.90	6.90	6.90	0.80	0.50	±12.0 %
5200	49.0	5.30	4.56	4.56	4.56	0.50	1.90	± 13.1 %
5300	48.9	5.42	4.38	4.38	4.38	0.50_	1.90	± 13.1 %
5800	48.5	5.77	3.76	3.76	3.76	0.55	1.90	± 13.1 %
5800	48.2	6.00	4.13	4.13	4.13	0.55	1.90	± 13.1 %

Certificate No: EX3-3770\_Apr14

Page 6 of 11

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<sup>&</sup>lt;sup>6</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), also it is restricted to ± 60 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

\*At frequencies below 3 GHz, the validity of tissue parameters (c and e) can be reliaved to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (c and e) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target issue parameters.

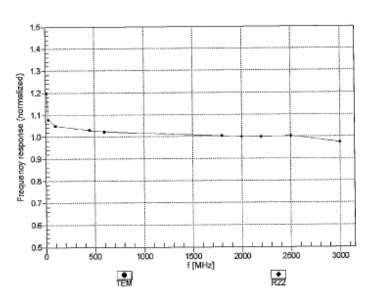
ApharDepth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-8 GHz at any distance larger than half the probe tip diameter from the boundary.



Page: 250 of 319

April 24, 2014 EX3DV4- SN:3770

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



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

Page 7 of 11 Certificate No: EX3-3770\_Apr14

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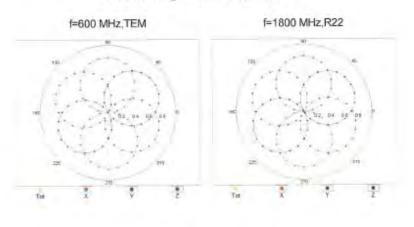
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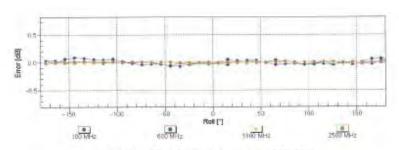


Page: 251 of 319

April 24, 2014 EX3DV4- SN:3770

# Receiving Pattern (\$\phi\$), 9 = 0°





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

Certificate No: EX3-3770\_Apr14

Page 8 of 11

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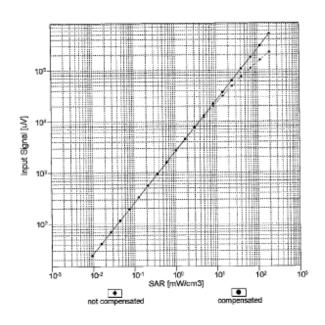


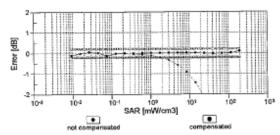
Page: 252 of 319

EX3DV4-SN:3770

April 24, 2014

# Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f<sub>eval</sub>= 1900 MHz)





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

Certificate No: EX3-3770\_Apr14

Page 9 of 11

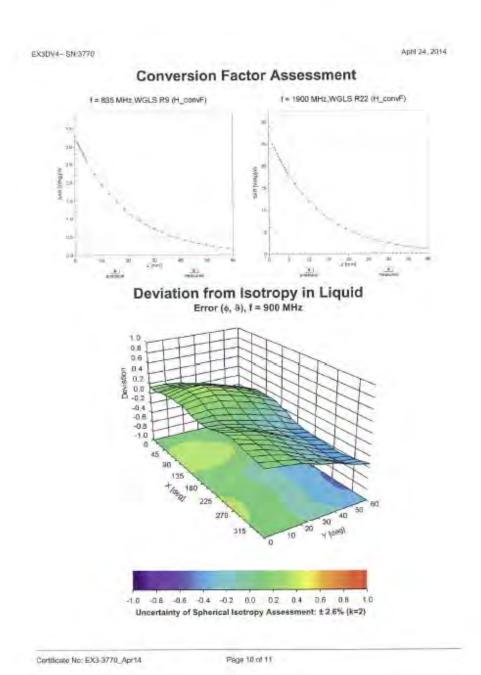
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Page: 254 of 319

EX3DV4-- SN:3770

April 24, 2014

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

#### Other Probe Parameters

Triangular
-34.3
enabled
disabled
337 mm
10 mm
9 mm
2.5 mm
1 mm
1 mm
1 mm
2 mm

Certificate No: EX3-3770\_Apr14

Page 11 of 11

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Page: 255 of 319

# 8. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test IEEE 1528

A	С	D	е	f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty %	Probability Distributioin	Div	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system								
Probe calibration(under 6Ghz)	6.55%	N	1		1	1 6.55%	6.55%	∞
Isotropy , Axial	3.50%	R	$\sqrt{3}$		1	1 2.02%	2.02%	$\infty$
Isotropy, Hemispherical	9.60%	R	$\sqrt{3}$		1	1 5.54%	5.54%	$\infty$
Boundary Effect	1.00%	R	$\sqrt{3}$		1	1 0.58%	0.58%	$\infty$
Linearity	4.70%	R	$\sqrt{3}$		1	1 2.71%	2.71%	$\infty$
Detection Limits	1.00%	R	$\sqrt{3}$		1	1 0.58%	0.58%	$\infty$
Readout Electronics	0.30%	N	1		1	1 0.30%	0.30%	$\infty$
Response time	0.80%	R	$\sqrt{3}$		1	1 0.46%	0.46%	$\infty$
Integration Time	2.60%	R	$\sqrt{3}$		1	1 1.50%		
Measurement drift (class A evaluation)	1.75%	R	√3		1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3		1	1.73%	1.73%	$\infty$
RF ambient conditions -reflections	3.00%	R	√3		1	1 1.73%	1.73%	$\infty$
Probe positioner Mechanical restrictions	0.40%	R	√3		1	1 0.23%	0.23%	$\infty$
Probe Positioning with respect to phantom	2.90%	R	√3		1	1 1.67%	1.67%	$\infty$
Post-processing	1.00%	R	$\sqrt{3}$		1	1 0.58%	0.58%	$\infty$
Max SAR Eval	1.00%	R	$\sqrt{3}$		1	1 0.58%	0.58%	
Test Sample related								
Test sample	2.90%	N	1		1	1 2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1		1	1 3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3		1	1 2.89%	2.89%	$\infty$
Phantom and Setup								
Phantom Uncertainty	4.00%	R	√3		1	1 2.31%	2.31%	$\infty$
Liquid conductivity(meas.)	4.94%	N	1	0.6	4 0.4			
Liquid permitivity(meas.)	4.98%	N	1	0.	6 0.4	9 2.99%	2.44%	M
Combined standard uncertainty		RSS				12.36%	12.01%	
Expant uncertainty (95% confidence interval), K=2						24.72%	24.03%	

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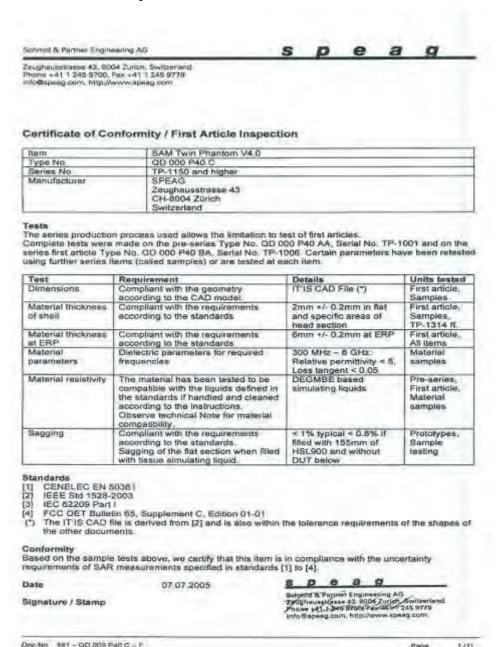
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Page: 256 of 319

# 9. Phantom Description



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Page: 257 of 319

# 10. System Validation from Original Equipment Supplier

Calibration Laboratory of Schweigerischer Kalibnertie Schmid & Partner Service suisse d'étalonnage C ST SRATE Servizio evizzero di taratura Engineering AG isstrasse 43, 8004 Zurich, Switzerland Swiss Calibration Service Accredited by the Swiss Accreditation Service (SAS) Accreditation No.: SCS 108 The Swiss Accreditation Service is one of the signaturies to the EA Multilateral Agreement for the recognition of calibration certificates Certificate No: D750V3-1015\_Aug14 SGS-TW (Auden) CALIBRATION CERTIFICATE D750V3 - SN 1015 Calibration procedura(s) QA CAL-05.V9 Calibration procedure for dipole validation kits above 700 MHz August 28, 2014 Calibration date: This contradion certificate documents the traceasisty to national identifiers. Which cause the physical units of magazinements (Ei). The measurements and the uncertainties with confidence probability are given on the following pages and are pain of the certificans. All calibrations have been conducted in the crosed laboratory facility: environment temperature (12 ± 3)° U and humidity < 70%. Cilibration Equipment used IMATE critical for established 154 Primary Standarda Cal Date (Cartificate No.) Stheduled Calibration X1837480704 00-Oct-13 (No. 217-01H27) Dcf-14 Pilwer meter EPM-442A US37292783 09-Oct-13 (No. 217-01827) POWER SRIBOT HE 8481 A MEY41092317 09-Oct-13 (No. 217 01828) Detail 03-Apr-14 (No. 217-01916) Helevence 20 dB Attenuator SN. 5058 (20k) AD1-15 Type-N mismatch combination 9N: 5047.2 / 06327 03-Apr-14 (No. 217-01921) Apr-15 Returence Probe ESSDV3 BN: 3205 30-Dec-13 (No. ES3-3205, Dec13) Dec 14 DAGA Sec. 601 IB-Aug-14 (No. DAE4-63) Aug 14) Aug-15 Check Date (in house) Scheduled Check econdary Standards RF generator RAS SMT-06 100006 Ot-Aug-99 (in house check Oct-15) in house check. Oct-16 US37390585 S4208 Network Analyzer HP 87535 18-Oct-01 (in house check Oct-13) in house chack: Oct-1a Californial by Michael Wirber Laboratory Technician M. Weboo Technical Annuger Katu Rólovu: Approved by Hisued: August 26, 2014 This calibration partitiose shall not be reproduced biologif in full without written approval of the laboratory

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Page 1 of 8

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Certificate No: D750V3-1015 Aug14

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Page: 258 of 319

Calibration Laboratory of Schmid & Partner Engineering AG Zeughaussträsse 43, 8004 Zurich, Switzerland





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Accorditation No.: SCS 108

According by the Swiss According to Savice (SAS)

The Swiss Accombitation Service in one of the agreements to the EA Mustilatoral Agreement for the recognition of calibration certificates

#### Glossary:

TSL ConvF

N/A

tissue simulating liquid

sensitivity in TSL / NORM x y,z not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, TEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)",
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL. The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna
- SAR for nominal TSL parameters. The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Certificate New 0750V3-1015 Aug 14

Face 8 of 6

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Page: 259 of 319

#### Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY5	V52.8.5
Advanced Extrapolation	
Modular Flat Phanton	
15 mm	with Spacer
cix dy, dz = 1 mm	
750 MHz = 1 MHz	
	Advanced Extrapoletion  Modular Rat Phantiam  15 mm  UK JV, dz ≠5 mm

## Head TSL parameters

he following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mhp/m
Measured Head TSL parameters	(22.0 ± 0.2) VO	#2.2 ± 6 %	0,91 mho/m ± 6 %
Head TSL temperature change during test.	< 0.5 °C		-

## SAR result with Head TSL

SAR averaged over 1 cm <sup>2</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW Input power	2.11 W/kg
SAR for pominal Head TSL parameters	normalized to 1W	8.31 W/kg ± 17.0 % (km2)

5AR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input prover	1.38 W/kg
SAR for numinal Head TSL parameters	normalized to 1W	5.45 W/kg ± 16.5 % (k=2)

## Body TSL parameters

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22,0 °C	55,5	0,96 mho/m
Measured Body TSL parameters	(22.0±0.2) °C	55,4 ± 8 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	1,000	name (

#### SAR result with Body TSL

SAR averaged over 1 cm <sup>2</sup> (1 g) of Body TSL	Condition	
SAR measured	950 mW input power	2.24 WAsg.
SAR for nominal Body TSL parameters	What is beginner	8.75 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm2 (10 g) of Body TSL	condition	
SAR measured	250 mW Input power	1.49 W/kg
SARI for nominal Body TSL gammeters	normalized to TW	5.85 W/kg ± 16.5 % (k=2)

Centicate No: D750V3-1015\_Aug14

Page 9 of 8

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Page: 260 of 319

## Appendix (Additional assessments outside the scope of SCS108)

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.1 Ω - 0.4 jΩ
Return Loss	- 30.4 dB

## Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 2.9 jΩ	
Return Loss	- 29.5 dB	

#### General Antenna Parameters and Design

Electrical Delay (one direction) 1.037 ns	
---	--

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional FUT Data

Manufactured by	SPEAG	
Manufactured on	March 22, 2010	

Certificate No: D750V3-1015\_Aug14

Page 4 of 8

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Page: 261 of 319

## **DASY5 Validation Report for Head TSL**

Date: 28.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1015

Communication System: UID 0 - CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz;  $\sigma = 0.91$  S/m;  $\epsilon_c = 42.2$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section

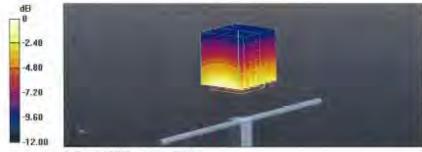
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.37, 6.37, 6.37); Calibrated: 30.12.2013;
- · Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52-52.8.8(1222); SEMCAD X 14.6.10(7331)

## Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx≈5mm, dy=5mm, dz=5mm Reference Value = 53.68 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 3.13 W/kg SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.38 W/kg Maximum value of SAR (measured) = 2.46 W/kg



0 dB = 2.46 W/kg = 3.91 dBW/kg

Cartificate No: D750V3-1015\_Aug14

Page 5 of B

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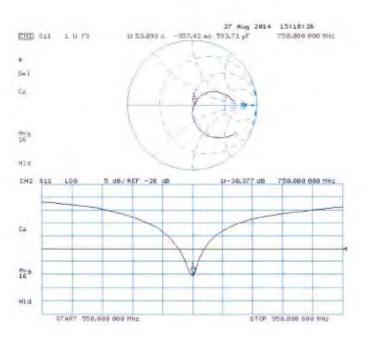
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Page: 262 of 319

## Impedance Measurement Plot for Head TSL



Certificate No: D750V3-1015\_Aug14

Page 5 of 8

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Page: 263 of 319

## DASY5 Validation Report for Body TSL

Date: 27.08:2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz: Type: D750V3; Serial: D750V3 - SN: 1015

Communication System: UID 0 - CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz;  $\sigma = 0.99 \text{ S/m}$ ;  $\varepsilon_c = 55.4$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63,19-2011)

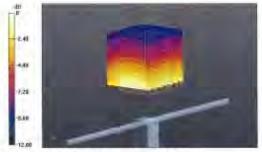
#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.13, 6.13, 6.13); Calibrated: 30.12.2013;
- Sensor-Surface; 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52,8,8(1222); SEMCAD X 14.6.10(7331)

## Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 53.06 V/m; Power Drift = 40.02 dB Peak SAR (extrapolated) = 3,26 W/kg SAR(1 g) = 2.24 W/kg; SAR(10 g) = 1.49 W/kg

Maximum value of SAR (measured) = 2.60 W/kg



0 dB = 2.60 W/kg = 4.15 dBW/kg

Certificate No D750V3-1015\_Aug14

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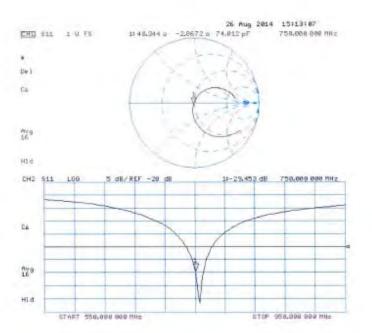
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Page: 264 of 319

## Impedance Measurement Plot for Body TSL



Certificate No: D750V3-1015\_Aug14

Page 8 of 8

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Page: 265 of 319

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Client SGS-TW (Auden)

Accorditation No.: SCS 108

Certificate No. D835V2-4d063 Aug 14

Section 1	redshirt and the	OF E	
Object	D835V2 - SN. 40	063	
Dateration procedura(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	we 700 MHz
nestrution date:	August 28, 2014		
		ional standards, which realize the physical un robublity are given on the following pages ar	
		ry lacility, environment immorature (22 ± 31)	
Cathration Equipment used (M&	E critical for calibration)		
	IE critical for calibration)	Cal Date (Certificate No.)	Scheduled Calibration
Primary Standards Power meller EPM-442A	1	Cal Date (Certificate No.) 09-0c=13 (No. 217-01827)	Scheduled Calibration Oct-14
Pilmary Standards Power maler EPM-442A Power sensor HP 9461A	ID.# B837480704 US37292783	09-Gc+13 (No. 217-01627) 09-Gc+13 (No. 217-01627)	Oct-14 Oct-14
Primary Standards Power maler EPM-442A Power sensor HP 9461A Power sensor HP 9461A	ID # GB37480704 US37292783 MY41092317	09-Oc+13 (No. 217-01627) 09-Oc+13 (No. 217-01627) 09-Oc+13 (No. 217-01628)	Oct-14 Oct-14
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Primary Standards Fower malar EPM-442A Tower season HP 9461A Power season HP 9461A Reference 20 d0 Afterwalor Type-N mismatch combination Reference Proce ES30VI DAE4	ID # GB37480704 US37292788 MY41092317 SN: 5008 (20K) SN: 5047.27 (08327 SN: 3206 SN: 601	0#-Oc+13 (No. 217-01827) 0#-Oc+13 (No. 217-01827) 0#-Oc+13 (No. 217-01828) 03-Apr-14 (No. 217-01818) 03-Apr-14 (No. 217-0191) 33-Oc+13 (No. ES3-3200, Dec13) 18-Aug-14 (No. DAE4-601, Aug14)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15
Primary Standards Ower male: EPM-442A Yower sensor HP 9461A Yower sensor HP 9461A Telerence 20 dtl Ameruator Type-N mismatch combination Telerence Proce ESSOVI DAE4 Secondary Standards	ID # G837480704 US37292783 MY41993317 SN: 5066 (20K) SN: 5047.27 (08327 SN: 509 SN: 601	0#-Oc=13 (No. 217-01827) 0#-Oc=13 (No. 217-01827) 0#-Oc=13 (No. 217-01828) 03-Apr-14 (No. 217-01916) 03-Apr-14 (No. 217-01921) 33-Oc=13 (No. ES3-3205, Dec13) 18-Aug-14 (No. DAE4-601, Aug14) Creck Date (in house)	Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Scheduled Chack
Primary Standards  Ower maler EFM-442A  Yower sensor HP 9461A  Adwer sensor HP 9461A  Teleference 20 df Americalor  ype-N mismatch combination  Reference Proce ESDOVI  DAE4  Secondary Standards  © generator R&S SMT-ce	ID # GB37480704 US37292788 MY41092317 SN: 5008 (20K) SN: 5047.27 (08327 SN: 3206 SN: 601	0#-Oc+13 (No. 217-01827) 0#-Oc+13 (No. 217-01827) 0#-Oc+13 (No. 217-01828) 03-Apr-14 (No. 217-01818) 03-Apr-14 (No. 217-0191) 33-Oc+13 (No. ES3-3200, Dec13) 18-Aug-14 (No. DAE4-601, Aug14)	Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Schottsled Chack In Pousa check: Oct-16
Calibration Equipment used (M& Primary Standards Power malar EPM-442A Power sensor HP 9461A Power sensor HP 9461A Reference 20 dD Americator Type N information combination fluidimence Probe ESOOV0 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	ID # IB37480704 US37292783 MY41092317 SN: 5006 (20K) SN: 5047.2 / 08327 SN: 3006 SN: 601	0#-Oci-13 (No. 217-01827) 0#-Oci-13 (No. 217-01827) 0#-Oci-13 (No. 217-01828) 03-Apr-14 (No. 217-01818) 03-Apr-14 (No. 217-01911) 30-Oci-13 (No. ESS-2205, Dec13) 18-Aug-14 (No. DAE4-601, Aug-14) Orrock Date (in house) 04-Aug-89 (in house check Oci-13) 18-Oci-11 (in house check Oci-13)	Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Scheduled Chack In nouse chack, Oct-14 Ill nouse chack, Oct-14
Primary Standards  Power relier EPM-442A  "dwer seesor HP 8461A  Power sensor HP 8481A  Reference 20 d0 Americator  (ype-N mismatch combination  reference Proce ESODY)  DAE4  Secondary Standards  RF generator R&S SMT-C6	ID # 6937480704 US37292793 MY41092317 SN: 5006 (20K) SN: 5047.27 (06327 SN: 3206 SN: 601 ID # 100005 US37390695 S4206	0#-Ocs-13 (No. 217-01627) 0#-Ocs-13 (No. 217-01627) 0#-Ocs-13 (No. 217-01628) 03-Apr-14 (No. 217-01618) 03-Apr-14 (No. 217-01621) 33-Ocs-13 (No. ES3-2205_Dec13) 18-Aug-14 (No. DAE4-601_Aug14) Cirrick Date (in house)	Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Schottsled Chack In Pousa check: Oct-16
Primary Standards Ower male: EPM-442A Yower sensor HP 9461A Yower sensor HP 9461A Telerence 20 d0 Americator Type-14 mismatch combination Telerence Proce ESSOVI DAE4 Secondary Standards Figurerator R&S SMT-66 Velwork Analyzer HP 8753E	ID # GB37480704 US37292783 MY41993317 SN: 5086 (20K) SN: 5047.27 (08327 SN: 509 SN: 601 ID # 100005 US37396685 S4206	04-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Occ-13 (No. ES3-2206, Dec13) 18-Aug-14 (No. DAE4-601, Aug-14) Creck Date (in house) 04-Aug-86 (in house) Cct-13) 18-Oct-01 (in house) Cct-13)	Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Scheduled Chack In rouse chack, Oct-14 Ill rouse chack, Oct-14
Primary Standards Ower male: EPM-442A Yower sensor HP 9461A Yower sensor HP 9461A Telerence 20 d0 Americator Type-14 mismatch combination Telerence Proce ESSOVI DAE4 Secondary Standards Figurerator R&S SMT-66 Velwork Analyzer HP 8753E	ID # GB37480704 US37292783 MY41993317 SN: 5086 (20K) SN: 5047.27 (08327 SN: 509 SN: 601 ID # 100005 US37396685 S4206	04-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Occ-13 (No. ES3-2206, Dec13) 18-Aug-14 (No. DAE4-601, Aug-14) Creck Date (in house) 04-Aug-86 (in house) Cct-13) 18-Oct-01 (in house) Cct-13)	Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Scheduled Check In rouse check Oct-14 Ill rouse check Oct-14

Certificate No: D835V2-4d063\_Aug14

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Page: 266 of 319

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#### Glossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORM x,y,z N/A not applicable or not measured

## Calibration is Performed According to the Following Standards:

- EEE 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
- EC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)". February 2005
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
  of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL. The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
  positioned under the liquid filled phantom. The impedance stated is transformed from the
  measurement at the SMA connector to the feed point. The Return Loss ensures low
  reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point.
   No uncertainty required.
- . SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Certificate No: D835V2-4df6:L Augili

Page 2 of 8

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Page: 267 of 319

## Measurement Conditions

ASY system configuration, as far as not	given on page 1.	
DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

## Head TSL parameters

he following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.94 mha/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>2</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.24 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.05 W/kg ± 16.5 % (k=2)

## **Body TSL parameters**

g parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.2 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

## SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.35 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.21 W/kg ± 16.5 % (k=2)

Certificate No: D835V2-4d063\_Aug14

Page 3 of 8

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Page: 268 of 319

## Appendix (Additional assessments outside the scope of SCS108)

## Antenna Parameters with Head TSL

Impedance: transformed to fried point	51.7 \Omega - 3.6 \Omega	
Return Loss.	-28,2 dB	

## Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.1 II - Ji.B ji.i	
Raturn Loss	-23.7 dB	

## General Antenna Parameters and Design

Water Control of the Control	to before
Electrical Delay (one direction)	T-091-05

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard symfrigin coaxial cable. The center conductor of the feeding line at directly connected to the second arm of the dipole. The antenna is therefore short-diculted for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standars.

No excessive large must be applied to the dipole arms, because they might bend on the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 27, 2006

Certificate No: D835V2-4:063 Aug 14

Face 4 of B

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Page: 269 of 319

#### DASY5 Validation Report for Head TSL

Date: 28.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063

Communication System: UID 0 - CW; Frequency: 835 MHz.

Medium parameters used: f = 835 MHz;  $\sigma = 0.94$  S/m;  $\varepsilon_r = 42$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section; Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63,19-2011)

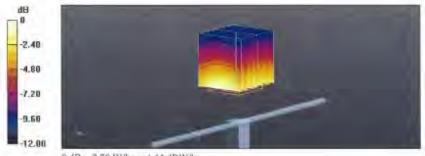
#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.22, 6.22, 6.22); Calibrated: 30.12,2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial; 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 56.23 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.55 W/kg Maximum value of SAR (measured) = 2.78 W/kg



0 dB = 2.78 W/kg = 4.44 dBW/kg

Certificate No: D835V2-4d083\_Aug14

Page 5 of 8

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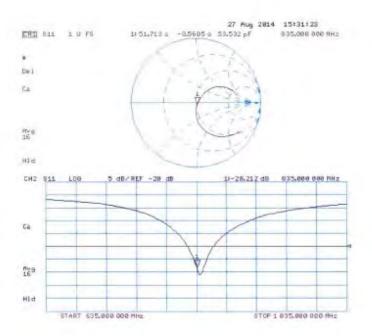
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Page: 270 of 319

## Impedance Measurement Plot for Head TSL



Certificate No: D835V2-4d063\_Aug14

Page 6 of 8

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Page: 271 of 319

#### DASY5 Validation Report for Body TSL

Date: 27.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz;  $\sigma = 1.01 \text{ S/m}$ ;  $\varepsilon_c = 55.2$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.09, 6.09, 6.09); Calibrated: 30.12.2013;
- Sensor-Surface; 3mm (Mechanical Surface Detection)
- Efectronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8,8(1222); SEMCAD X 14.6.10(7331)

## Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0;

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 54.65 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 3,53 W/kg

SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.59 W/kg Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4,47 dHW/kg

Certificate No: D835V2-4d063 Aug 14

Page 7 of 8

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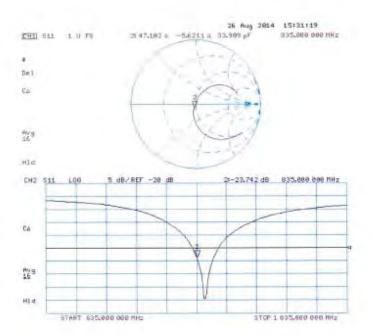
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Page: 272 of 319

## Impedance Measurement Plot for Body TSL



Certificate No: D835V2-4d063\_Aug14

Page 8 of 8

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Page: 273 of 319

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Accreditation No.: SCS 108

Certificate No: D1750V2-1008 Aug14

	ERTIFICATE		
Object	D1750V2 - SN: 1	800	
Сайочник ргосновин(в)	DA CAL-05.v9 Calibration proces	dure for dipole validation kits abo	we 700 MHz
Galbration date	August 26, 2014		
		onal scandards, which resides the physical un rebublity are given on the folkwing pages an	
All calibrations have been conduc	ded in the dicead laborator	y acety: endromieric arripentora (62 ± 3)*(	and inumetre = 70%
Calorision Equipment used (M&	E critical for calibration)		
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Fower meter EPM-462A Power sansor HF 6481A Power sensor HP 6481A Reference 20 dB Attenuator Type-N manualch combination	GB07460704 US37282783 MY41092317 SN: 5058 (20x) SN: 5047 2 / 06327	RH-Oct-13 (No. 217-01827) DB-Oct-13 (No. 217-01827) DB-Oct-13 (No. 217-01828) D3-Apr-14 (No. 217-01918) D3-Apr-14 (No. 217-01921)	Oct-14 Ces-1a Oct-14 Apr-15 Apr-15
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Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Releistance 20 dB Alternation Type-N manualch combination Reference Probe ESSOV3 DAE4 Secundary Standards RF generator RAS SMT-96 Melwork Analyzes HP 8753E	GB07460704 Usa7292783 MY41092317 SN: D059 (20x) SN: 5047-2/ (06327 SN: 3205 SN: 501 10.4 190605 US37390585 S4205 Name	Rii-Oct-13 (No. 217-01827) DB-Oct-13 (No. 217-01827) DB-Oct-13 (No. 217-01827) DB-Oct-13 (No. 217-01918) DB-Apri-14 (No. 217-01918) DB-Apri-14 (No. 217-01918) DB-Apri-14 (No. 217-01921) SB-Oct-13 (No. ESS-3506, Dect 3) TB-Aug-14 (No. DAE4-601_Aug-14) Check Date (In house) D4-Aug-98 (in house check Oct-13) TB-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Aug-15 Scheckled Check in house check: Oct-16 in house check: Oct-16

Certificate No: D1750V2-1008\_Aug14

Page 1 of 8

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Page: 274 of 319

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Schweizerischer Kalibrierdienut S Service suitare d'étalonnage C Security systems of faculture Swiss Calibration Service

Accreditation No.: SCS 108

Appended by the Swire Apprehinition Sinver (SAS)

The Sweet Accreditation Service is one of the signalistics to the EA. Multilateral Acreement to the recognition of calibration certificates

#### Glossary:

TSL

tissue simulating liquid

ConvF N/A

sensitivity in TSL / NORM x.y.z. not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)",
- KDB 865864, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

d) DASY4/5 System Handbook.

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end. of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized; SAR as measured, normalized to an input power of I W at the entenna
- SAR for nominal TSL parameters. The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Combosts No: 01750V2-1008\_Aug14

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Page: 275 of 319

## Measurement Conditions

DASY Version	DASY5	V52.6,8
Extrapolation	Advanced Extrapolation	
Phentom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Space
Zoom Scan Resolution	dx. dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

## Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	55/0 °C	40.1	1.37 m/m/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	392=5%	1.37 mho/m = 6 %
Head TSL temperature change during test	< 0.5 °C		_

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.9 W/kg = 17.0 % (k=2)

SAR averaged over 10 cm² (10 g) of Head TSL	rocionos	
SAR measured	250 mW input power	4.91 W/kg
SAR for nominal Head TSL parameters	normalized to tW	19.6 W/kg ± 16.5 % (k±2)

# **Body TSL parameters**

	Tamperature	Permittivity	Conductivity
Nomical Body TSL parameters	22,0 °C	53,A	1.49 mhalm
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.0±8%	1.49 mbo/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

## SAR result with Body TSL

SAR averaged over 1 cm <sup>2</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW Input power	9.44 W/kg
SAR for nominal Body TSL parameters	nomelized to 1W	37.5 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>2</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.07 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.2 W/kg ± 16.5 % (k=2)

Certificate No: D1750V2-1068\_Aug1/I

Page 3 of B

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Page: 276 of 319

## Appendix (Additional assessments outside the scope of SCS108)

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	$50.4 \Omega + 0.3 j\Omega$	
Return Loss	- 48.4 dB	

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	$46.4 \Omega + 0.3 j\Omega$	
Return Loss	- 28.5 dB	

## General Antenna Parameters and Design

	100000000
Electrical Delay (one direction)	1.222 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	February 11, 2009	7

Certificate No: D1750V2-1008\_Aug14 Page 4 of 8

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Page: 277 of 319

## DASY5 Validation Report for Head TSL

Date: 28.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz;  $\sigma = 1.37 \text{ S/m}$ ;  $\varepsilon_r = 39.2$ ;  $p = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConyF(5.23, 5.23, 5.23); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 95.53 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 9.26 W/kg; SAR(10 g) = 4.91 W/kgMaximum value of SAR (measured) = 11.6 W/kg



0 dB = 11.6 W/kg = 10.64 dBW/kg

Certificate No: D1750V2-1008 Aug14

Page 5 of 8

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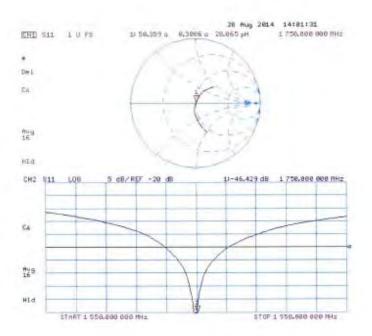
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Page: 278 of 319

## Impedance Measurement Plot for Head TSL



Certificate No: D1750V2-1008 Aug14 Page 6 of 8

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Page: 279 of 319

#### DASY5 Validation Report for Body TSL

Date: 28.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz;  $\sigma = 1.49 \text{ S/m}$ ;  $\epsilon_r = 52$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

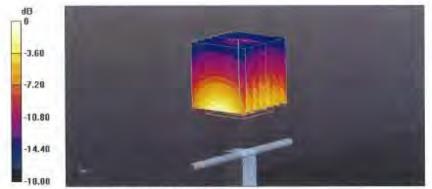
#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.89, 4.89, 4.89); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18:08:2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

## Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 93,44 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 16.3 W/kg SAR(1 g) = 9,44 W/kg; SAR(10 g) = 5.07 W/kg

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



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

Certificate No: D1750V2-1008, Aug14

Page 7 of 8

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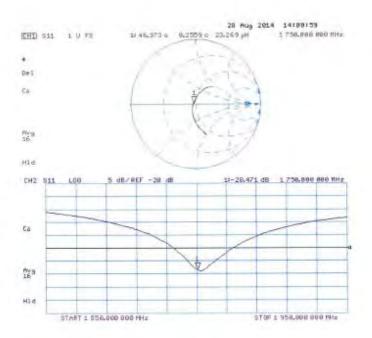
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Page: 280 of 319

## Impedance Measurement Plot for Body TSL



Certificate No: D1750V2-1008 Aug14

Page 8 of 8

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Page: 281 of 319

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Cilent SGS-TW (Auden)

Accreditation No.: SCS 108

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Certificate No: D1900V2-5d027\_Apr14

Direct	D1900V2 - SN: 5	d027	
Carbratori prosedureja	DA CAL-05,v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Cartrellor dale	April 23, 2014		
		onal standards, which realize the physical un robability are given on the following pages or	
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Certificate No: D1900V2-5d027\_April-4

Page 1 of 8

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Page: 282 of 319

#### Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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Swiss Calibration Service

Accreditation No.: SCS 108

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#### Glossarv:

TSL tissue simulating liquid ConvF sensitivity in TSL / NORM x,y,z N/A not applicable or not measured

#### Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

d) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Certificate No: D1900V2-5d027 Apr14

Page 2 of 8

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Page: 283 of 319

## Measurement Conditions

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

#### Head TSL parameters

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.36 mha/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	****	

## SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	-
SAR measured	250 mW input power	9.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.3 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.6 W/kg ± 16.5 % (k=2)

# **Body TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.4 ± 6 %	1.52 mha/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

## SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.87 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	39.3 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.22 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.8 W/kg ± 16.5 % (k=2)

Certificate No: D1900V2-5d027 Apr14

Page 3 of 8

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Page: 284 of 319

## Appendix

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 Ω + 6.8 jΩ
Return Loss	- 23.0 dB

## Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3 Ω + 2.8 jΩ
Return Loss	- 26.4 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-directed for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

Certificate No: D1900V2-5d027\_Apr14

Page 4 of 8

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Page: 285 of 319

## **DASY5 Validation Report for Head TSL**

Date: 23.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

## DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz;  $\sigma = 1.36 \text{ S/m}$ ;  $\epsilon_r = 39.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.06, 5.06, 5.06); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25,04,2013
- Phantom: Flat Phantom 5.0 (front); Type; QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

## Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 97.825 V/m; Power Drift = 0,06 dB Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.71 W/kg; SAR(10 g) = 5.1 W/kg Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.90 dBW/kg

Certificate No: D1900V2-5d027\_Apr14

Page 5 of 8

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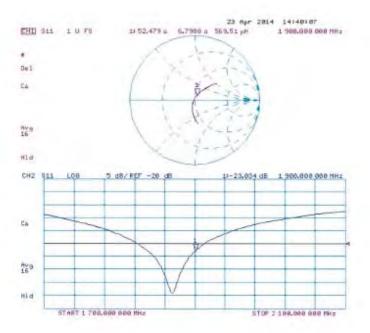
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Page: 286 of 319

## Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d027\_Apr14

Page 6 of 8

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Page: 287 of 319

### DASY5 Validation Report for Body TSL

Date: 22.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT; Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027

Communication System: LIID 0 - CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz;  $\sigma = 1.52$  S/m;  $\epsilon_c = 52.4$ ;  $\rho = 1000$  kg/m<sup>2</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25,04,2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

## Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm 2/Zoom Scan (7x7x7)/Cube 0;

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 94.526 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 17.2 W/kg

SAR(1 g) = 9.87 W/kg; SAR(10 g) = 5.22 W/kg Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

Certificate No: D1900V2-5d027\_Apr14

Page 7 of B

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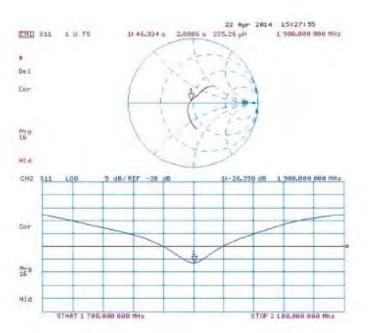
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Page: 288 of 319

## Impedance Measurement Plot for Body TSL



Certificate No: D1900V2-5d027\_Apr14

Page 8 of 8

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Page: 289 of 319

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio avizzero di taratura Swiss Calibration Service

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Client SGS-TW (Auden)

Accreditation No.: SCS 108

Certificate No: D2450V2-727 Apr14

Diject	D2450V2 - SN: 7	27	
Calibration proceduralis)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calcoration date:	April 23, 2014		
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Certificate No: D2450V2-727\_Apr44

Page 1 of 8

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Page: 290 of 319

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### Glossary:

TSL ConvF N/A tissue simulating liquid sensitivity in TSL / NORM x,y,z

not applicable or not measured

### 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
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
  of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
  point exactly below the center marking of the flat phantom section, with the arms oriented
  parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
  positioned under the liquid filled phantom. The impedance stated is transformed from the
  measurement at the SMA connector to the feed point. The Return Loss ensures low
  reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point.
   No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Certificate No: D2450V2-727\_Apr14

Page 2 of 8

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Page: 291 of 319

#### Measurement Conditions

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.2 ± 6 %	1.81 mho/m ±6%
Head TSL temperature change during test	< 0.5 °C		

# SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.1 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.0 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>2</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.2 W/kg ± 16.5 % (k=2)

# Body TSL parameters

ing parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.6 ± 6 %	2.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.0 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.90 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.3 W/kg ± 16.5 % (k=2)

Certificate No: D2450V2-727\_Apr14

Page 3 of 8

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Page: 292 of 319

### Appendix

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.6 Ω + 1.9 jΩ
Return Loss	- 26.5 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.1 Ω + 3.5 jΩ
Return Loss	- 28.7 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction) 1.148 ns		
	1.148 ns	Electrical Delay (one direction)

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 09, 2003

Certificate No: D2450V2-727\_Apr14 Page 4 of 8

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Page: 293 of 319

#### DASY5 Validation Report for Head TSL

Date: 23.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 727

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz;  $\sigma = 1.81$  S/m;  $\varepsilon_r = 38.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

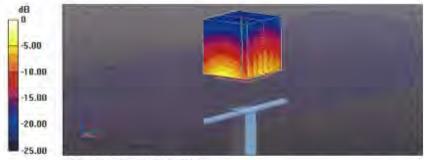
- Probe: ES3DV3 SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04,2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52,8.7(1137); SEMCAD X 14,6.10(7164)

# Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid; dx=5mm, dy=5mm, dz=5mm Reference Value = 100.01 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 27.0 W/kg

SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.09 W/kgMaximum value of SAR (measured) = 17.1 W/kg



0 dB = 17.1 W/kg = 12.33 dBW/kg

Certificate No: D2450V2-727\_April4.

Page 5 of 8

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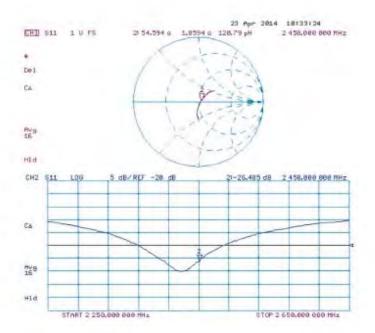
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Page: 294 of 319

### Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-727\_Apr14 Page 6 of 8

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Page: 295 of 319

#### DASY5 Validation Report for Body TSL

Date: 23.04,2014

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 727

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz,  $\sigma = 2.01$  S/m;  $\varepsilon_r = 50.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

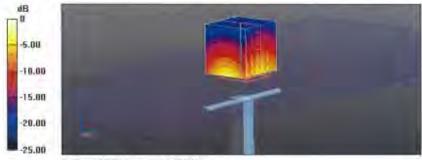
#### DASY52 Configuration:

- Probe: ES3DV3 SN3205: ConvF(4.35, 4.35, 4.35); Calibrated: 30.12,2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

# Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 94.356 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 26.9 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.9 W/kgMaximum value of SAR (measured) = 16.7 W/kg



0 dB = 16.7 W/kg = 12.23 dBW/kg

Certificate No: D2450V2-727\_Apr14

Page 7 of B

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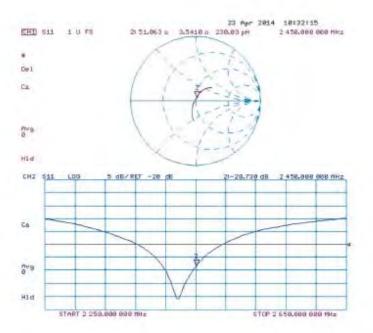
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Page: 296 of 319

### Impedance Measurement Plot for Body TSL



Certificate No: D2450V2-727\_Apr14

Page 8 of 8

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Page: 297 of 319

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zirrich, Switzerland





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SGS-TW (Auden)

Accreditation No.: SCS 108

C

Certificate Nor D2600V2-1005 Jan14

Disper	D2600V2 - SN: 1	005	
Calibration procedure(s)	QA CAL-05.v9 Calibration proces	dure for dipole validation kits abo	ve 700 MHz
Cultoration date:	January 2B, 2014		
The measurements and the unca	rtainties with confidence p	onal standards, which remize the physical on robability are given on the following pages an	d are part of the certification
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Page: 298 of 319

Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service suisse d'étalonnage С Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 108

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#### Glossary:

TSL ConvF N/A

tissue simulating liquid

sensitivity in TSL / NORM x,y,z not applicable or not measured

#### Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)",
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

d) DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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%

Certificate No: D2600V2-1005 Jan14

Page 2 of 8

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Page: 299 of 319

### Measurement Conditions

DASY system configuration, as far as not given on page 1.

ASY system configuration, as far as not	given on page 1.	
DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.2 ± 6 %	2.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	57.7 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	26.0 W/kg ± 16.5 % (k=2)

# Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.9 ± 6 %	2.21 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

# SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	14.3 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	56.2 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.33 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	25.1 W/kg ± 16.5 % (k=2)

Certificate No: D2600V2-1005\_Jan14

Page 3 of 8

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Page: 300 of 319

#### Appendix

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 3.2 jΩ
Return Loss	- 30.0 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.5 Ω - 2.6 jΩ
Return Loss	- 26.8 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.155 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 23, 2006

Certificate No: D2600V2-1005\_Jan14

Page 4 of 8

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Page: 301 of 319

#### DASY5 Validation Report for Head TSL

Date: 28.01,2014

Test Laboratory: SPEAG, Zurich, Switzerland

#### DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1005

Communication System; UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz;  $\sigma = 2.02 \text{ S/m}$ ;  $\epsilon_c = 38.2$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

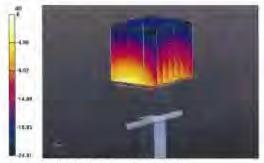
Measurement Standard; DASY5 (IEEE/IEC/ANSI C63-19-2007)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.46, 4.46, 4.46); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated; 25.04.2013
- Phantom: Flat Phantom 5,0 (front); Type; QD000P50AA; Serial: [00]
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

# Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 98.590 V/m; Power Drift = 0.08 dB Peak SAR (extrapolated) = 31.3 W/kg SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.57 W/kg Maximum value of SAR (measured) = 19.3 W/kg



0.0B = 19.3 W/kg = 12.86 dBW/kg

Certificate No: D2600V2-1005\_Jan14

Paga 5 of 8

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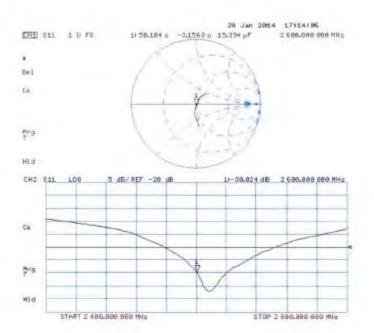
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Page: 302 of 319

### Impedance Measurement Plot for Head TSL



Certificate No: D2600V2-1005\_Jan14

Page 6 of 8

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Page: 303 of 319

### DASY5 Validation Report for Body TSL

Date: 28.01.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1005

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz;  $\alpha = 2.21 \text{ S/m}$ ;  $\epsilon_r = 50.9$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

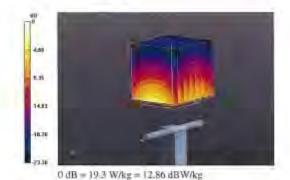
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.24, 4.24, 4.24); Calibrated: 30.12.2013
- + Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Su601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

# Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.624 V/m; Power Drift = -0.00 dB Peak SAR (extrapolated) = 30.8 W/kg SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.33 W/kg Maximum value of SAR (measured) = 19.3 W/kg



Certificate No: D2600V2-1085\_Jan18

Page 7 of 8

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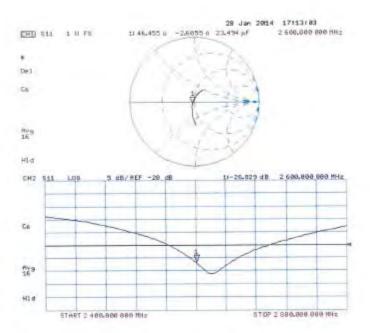
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Page: 304 of 319

### Impedance Measurement Plot for Body TSL



Certificate No: D2600V2-1005 Jan14

Page 8 of 8

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Page: 305 of 319

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Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of salibration certificates

Client SGS-TW (Auden)

Accreditation No.: SCS 108

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Certificate No: D5GHzV2-1104\_Apr14

Object	D5GHzV2 - SN:	1104	
Calibration processure(s)	QA CAL-22.v2 Calibration proce	dure for dipole validation kits bet	ween 3-8 GHz
Calibration date:	April 16, 2014		
The measurements and the unc	ertainties with confidence p	ional standards, which realize the physics or robubility are given on the following pages or ry buowly: environment temperature (22 ± 3)*	nd are part of the certificate.
Printing Shortants	10.4	Cali Date (Certificate No.)	Scheduled Calibration
Primary Shandards Towar mater EPM-442A	ID # GB3748670#	09-Ocs-13 (No. 217-01827)	Oct-14
nimmy Shantants Deep mater EPM-442A Ower sensor HF 8481A	ID 4 GB37480704 US37282783	09-Oc-13 (No. 217-01827) 09-Ocl-13 (No. 217-01827)	Oct-14 Oct-14
Princery Standards Power motor EPM-442A Power Sensor HF 8481A Tower Sensor HF 8481A	ID # GB37480704 US37282753 MY41092317	09-Ocs-13 (No. 217-01821) 09-Ocs-13 (No. 217-01821) 09-Ocs-13 (No. 217-01828)	Oct-14 Oct-14 Cad-14
rimmy Shantants Tower meter EPM-442A Tower Sensor HF 6481A Tower Sensor HF 6481A Toleronce 20 dB Attenuator	ID # GB3748070# US37292763 MY41092317 3N 5056 (20k)	09-Oc-13 (No. 217-01827) 09-Oci-13 (No. 217-01827) 09-Oci-13 (No. 217-01828) 03-Apr-14 (No. 217-01918)	Cct-14 Cct-14 Cct-14 Ap=12
Primary Standards  Paser mater EPM-442A  Power sensor HF 8481A  Teleformore SO GE Alternation  Type-Is mismatch combination	ID 4 GB37480704 US37292763 MY41092317 SN 5050 (20k) SN 5047.2 / 06327	09-Oc-13 (No. 217-0162?) 09-Oc-13 (No. 217-0162?) 09-Oc-13 (No. 217-01628) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01621)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15
Primary Standards Power Instance PM-442A Power Sensor HF 8481A Power Sensor HF 8881A Reference 20 dB Altenuard Type-N mismatch combination Reference Probe EX3DV4	ID 4 GB37480704 US37282753 MY41032317 SN: 5050 (20K) SN: 5047-2 / 06327 SN: 5503	09-Oct-13 (No. 217-01627) 09-Oct-13 (No. 217-01627) 09-Oct-13 (No. 217-01628) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01621) 30-Oes-13 (No. 237-01621)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14
Primary Sharetands  Painter Install EPM-942A  Power Sensor HEF 8481A  Tower Sensor HEF 9481A  Tolerande 20 dB Alternation  Type-N mismatch combination  Taterance Proba EX3DV4  AAE4	ID 4 GB37480704 US37292763 MY41092317 SN 5050 (20k) SN 5047.2 / 06327	09-Oc-13 (No. 217-0162?) 09-Oc-13 (No. 217-0162?) 09-Oc-13 (No. 217-01628) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01621)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15
Calibration Equipment used (Me Primary Standards Power matter EPM-442A Power sensor HF 8481A Power sensor HF 8481A Power sensor HF 8481A Reference 20 dB Attenuation Type-K mismatch combination Reference Probe EX3DV4 DAE#	ID 4 GB37480704 US37282783 MY41032317 9N 5050 (20k) SN 5047 2 / 06327 SN 901	09-Oc-13 (No. 217-01627) 09-Oc-13 (No. 217-01627) 09-Oc-13 (No. 217-01628) 03-Apr-14 (No. 217-01928) 03-Apr-14 (No. 217-01621) 30-Des-13 (No. EXX-3003, Duc13) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Apr-14 Schedular Check
Primary Standards  Primar Install EPM-642A  Power Sensor HEF 6481A  Power Sensor HEF 6481A  Reference 20 dB Attenuation  Type-K mismatch combination  Reference Probe EX3DV4  DAE4  Securitary Standards  HE generator HISS SMI-68	ID 4 GS37480704 US37282783 MY41093317 9N 5050 (20k) SN 6047.2 / 06327 SN 6041	O9-Oct-13 (No. 217-01627) O9-Oct-13 (No. 217-01627) O9-Oct-13 (No. 217-01628) O3-Apr-14 (No. 217-01621) O3-Oct-13 (No. 217-01621) O3-Oct-13 (No. EX3-3503 Dec13) 25-Apr-13 (No. DAEa-601_Apr13)	Oct-14 Oct-14 Oct-14 Oct-14 Apr-15 Des-14 Apr-14 Scheduler Check In hoose check, Oct-16
Primary Standards  Primer media EPM-442A  Primer Sensor HEF 8481A  Primer Sensor HEF 8481A  Reference 20 dB Attenuation  Type-K mismatch combination  Reference Probe EX3DV4  DAE4	ID 4 GB37480704 US37282753 MY4 (092317 9N 5050 (20K) SN 5040 7.2 / 06327 5N 5003 SN 601	09-Oct-13 (No. 217-01627) 09-Oct-13 (No. 217-01627) 09-Oct-13 (No. 217-01628) 05-Apr-14 (No. 217-01928) 05-Apr-14 (No. 217-01621) 30-Oct-13 (No. EX3-3503, Dec13) 25-Apr-13 (No. DAEa-601_Apr13) Check Date (in house) 04-Aug-39 (in flowing effect Oct-13)	Oct-14 Oct-14 Oct-14 Oct-14 Apr-15 Des-14 Apr-15 Des-14 Apr-14 Scheduler Check In house effects, Oct-16
Printing Standards Power season HEF 8481A Power season HEF 8481A Power season HEF 8481A Parter season HEF 8481A Reference 20 dB Attenuation Fype-R mismatch combination Reference Probe EXSTV4 DAE4 Secondary Standards — generator Has SMI 456 Retwork Amerization HEF 8753E	ID # ISS7/48070# US3/282/83 MY41092317 9N 5050 (20k) SN 6047.2 / 06327 SN 9503 SN 001 ID # 100005 US37/390583 \$4206	09-Oc-13 (Nu. 217-01627) 09-Oc-13 (Nu. 217-01627) 09-Oc-13 (Nu. 217-01627) 00-Oc-13 (Nu. 217-01628) 00-Apr-14 (Nu. 217-01621) 30-Dec-13 (Nu. 217-01621) 30-Dec-13 (Nu. EXX-3003, Dec13) 25-Apr-13 (Nu. DAE-1-601_Apr13) Check Date (in Insues) 04-Aug-99 in Tourie check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Apr-14 Apr-14 Scheduler Checs In house check, Oct-16 in house check: Oct-14
Primary Standards  Primar Install EPM-642A  Power Sensor HEF 6481A  Power Sensor HEF 6481A  Reference 20 dB Attenuation  Type-K mismatch combination  Reference Probe EX3DV4  DAE4  Securitary Standards  HE generator HISS SMI-68	ID # IBS748070# US37282783 MY41032317 SN 5050 (20k) SN 5047 2 / 06327 SN 5047 2 / 06327 SN 601 ID # 100005 US37390383 54206	09-Oc-13 (No. 217-01627) 09-Oc-13 (No. 217-01627) 09-Oc-13 (No. 217-01628) 03-Apr-14 (No. 217-01628) 03-Apr-14 (No. 217-01621) 30-Oc-13 (No. 217-01621) 30-Oc-13 (No. DAE-1-601_Apr13) 25-Apr-13 (No. DAE-1-601_Apr13) Check Date (in house) 04-Aug-39 (in flouise check Oct-13) 18-Oc-01 (In house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Apr-14 Apr-14 Scheduler Checs In house check, Oct-16 in house check: Oct-14
Primary Standards  Primer install EPM-642A  Primer sensor HP 8481A  Secondary Standards  HE generator HRS SMI 456  Retwork Amerizat HP 8753E	ID # IBS748070# US37282783 MY41032317 SN 5050 (20k) SN 5047 2 / 06327 SN 5047 2 / 06327 SN 601 ID # 100005 US37390383 54206	09-Oc-13 (No. 217-01627) 09-Oc-13 (No. 217-01627) 09-Oc-13 (No. 217-01628) 03-Apr-14 (No. 217-01628) 03-Apr-14 (No. 217-01621) 30-Oc-13 (No. 217-01621) 30-Oc-13 (No. DAE-1-601_Apr13) 25-Apr-13 (No. DAE-1-601_Apr13) Check Date (in house) 04-Aug-39 (in flouise check Oct-13) 18-Oc-01 (In house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-15 Apr-15 Dec-14 Apr-14 Scheduler Check In house check, Oct-16 in house check, Oct-14

Certificate No: D5GHzV2-1104\_Apr14

Page 1 of 15

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Page: 306 of 319

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Accreditation No.: SCS 108

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Muttilateral Agreement for the recognition of calibration certificates

#### Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

### Calibration is Performed According to the Following Standards:

- a) IEC 62209-2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", March 2010
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"
- c) 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

### Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
  of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
  point exactly below the center marking of the flat phantom section, with the arms oriented
  parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
  positioned under the liquid filled phantom. The impedance stated is transformed from the
  measurement at the SMA connector to the feed point. The Return Loss ensures low
  reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point.
   No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Certificate No: D5GHzV2-1104\_Apr14

Page 2 of 15

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Page: 307 of 319

#### Measurement Conditions

DASY system configuration, as far as not given on page 1

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5300 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

### Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.8 ± 6 %	4.43 mha/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm <sup>2</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	80.0 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm <sup>2</sup> (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.8 W/kg ± 19.5 % (k=2)

Certificate No: D5GHzV2-1104\_Apr14 Page 3 of 15

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Page: 308 of 319

### Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.7 ± 6 %	4.54 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	84.3 W / kg ± 19.9 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.0 W/kg ± 19.5 % (k=2)

# Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.3 ± 6 %	4.83 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

### SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.31 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	82.8 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.5 W/kg ± 19.5 % (k=2)

Certificate No: D5GHzV2-1104\_Apr14

Page 4 of 15

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Page: 309 of 319

### Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.0 ± 6 %	5.03 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	79.2 W/kg ± 19.9 % (k=2)

	SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
į	SAR measured	100 mW input power	2.26 W/kg
į	SAR for nominal Head TSL parameters	normalized to 1W	22.5 W/kg ± 19.5 % (k=2)

Certificate No: D5GHzV2-1104\_Apr14

Page 5 of 15

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Page: 310 of 319

#### Body TSL parameters at 5200 MHz

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.0 ± 6 %	5.44 mha/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

#### SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.69 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.3 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.3 W/kg ± 19.5 % (k=2)

#### Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.8 ± 6 %	5.57 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

### SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.84 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	77.8 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.7 W/kg ± 19.5 % (k=2)

Certificate No: D5GHzV2-1104\_Apr14

Page 6 of 15

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Page: 311 of 319

#### Body TSL parameters at 5600 MHz

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.3 ± 6 %	5.96 mha/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

# SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	81.4 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.6 W/kg ± 19.5 % (k=2)

### Body TSL parameters at 5800 MHz

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.0 ± 6 %	6.23 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

### SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.73 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.7 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.1 W/kg ± 19.5 % (k=2)

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Page 7 of 15

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Page: 312 of 319

#### Appendix

# Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	48.2 Ω - 4.8 jΩ
Return Loss	- 25.6 dB

#### Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	48.5 Ω - 7.6 jΩ
Return Loss	- 22.2 dB

#### Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	53.9 Ω + 0.5 jΩ
Return Loss	- 28.5 dB

#### Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	58.3 Ω - 4.4  Ω
Return Loss	- 21.2 dB

#### Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	52.6 Ω - 9.2 μΩ
Return Loss	- 20.6 dB

### Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	53.3 Ω - 1.8 jΩ
Return Loss	- 28.7 dB

# Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	58.7 Ω - 5.2 jΩ
Return Loss	- 20.6 dB

### Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	57.0 Ω + 2.2 jΩ
Return Loss	- 23.3 dB

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Page 8 of 15

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Page: 313 of 319

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.207 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 24, 2010

Certificate No: D5GHzV2-1104\_Apr14

Page 9 of 15

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Page: 314 of 319

# **DASY5 Validation Report for Head TSL**

Date: 16.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1104

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600

MHz, Frequency: 5800 MHz

Medium parameters used: f = 5200 MHz;  $\sigma = 4.43 \text{ S/m}$ ;  $\epsilon_r = 35.8$ ;  $\rho = 1000 \text{ kg/m}^3$ , Medium parameters used: f = 5300 MHz;  $\sigma = 4.54$  S/m;  $\epsilon_r = 35.7$ ;  $\rho = 1000$  kg/m $^3$  , Medium parameters used: f = 5600 MHz;  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  , Medium parameters used:  $\sigma = 1000$  kg/m $^3$  kg/m4.83 S/m;  $\epsilon_r$  = 35.3;  $\rho$  = 1000 kg/m³, Medium parameters used: f = 5800 MHz;  $\sigma$  = 5.03 S/m;  $\epsilon_r$  = 35;  $\rho$  = 1000 kg/m3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.52, 5.52, 5.52); Calibrated: 30.12.2013, ConvF(5.2, 5.2, 5.2); Calibrated: 30.12.2013, ConvF(4.86, 4.86, 4.86); Calibrated: 30.12.2013, ConvF(4.91, 4.91, 4.91); Calibrated: 30.12.2013;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

# Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.950 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 29.4 W/kg

SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.29 W/kg

Maximum value of SAR (measured) = 18.2 W/kg

### Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.460 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.41 W/kg

Maximum value of SAR (measured) = 19.4 W/kg

# Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.602 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 33.3 W/kg

SAR(1 g) = 8.31 W/kg; SAR(10 g) = 2.36 W/kg

Maximum value of SAR (measured) = 19.7 W/kg

Page 10 of 15 Certificate No: D5GHzV2-1104, Apr14

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Page: 315 of 319

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 62.293 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 33.5 W/kg

SAR(1 g) = 7.95 W/kg; SAR(10 g) = 2.26 W/kgMaximum value of SAR (measured) = 19.1 W/kg



Certificate No: D5GHzV2-1104\_Apr14

Page 11 of 15

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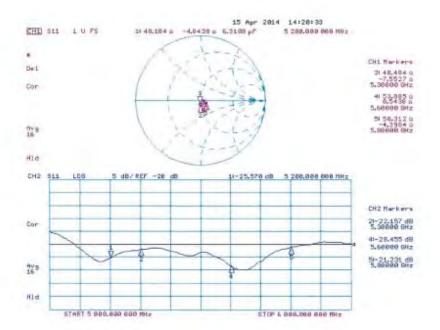
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Page: 316 of 319

### Impedance Measurement Plot for Head TSL



Certificate No: D5GHzV2-1104\_Apr14

Page 12 of 15

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Page: 317 of 319

#### DASY5 Validation Report for Body TSL

Date: 15.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

#### DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1104

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600

MHz, Frequency: 5800 MHz

Medium parameters used: f = 5200 MHz;  $\sigma = 5.44$  S/m;  $\varepsilon_r = 47$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used: f= 5300 MHz;  $\sigma$  = 5.57 S/m;  $\epsilon_r$  = 46.8;  $\rho$  = 1000 kg/m<sup>3</sup>, Medium parameters used: f = 5600 MHz;  $\sigma$  = 5.96 S/m;  $\epsilon_r$  = 46.3;  $\rho$  = 1000 kg/m<sup>3</sup>, Medium parameters used: f = 5800 MHz;  $\sigma$  = 6.23 S/m;  $\epsilon_r$  = 46;  $\rho$  = 1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2013, ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013, ConvF(4.3, 4.3, 4.3); Calibrated: 30.12.2013, ConvF(4.47, 4.47, 4.47); Calibrated: 30.12.2013:
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

# Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 59.628 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 30.7 W/kg

SAR(1 g) = 7.69 W/kg; SAR(10 g) = 2.15 W/kg

Maximum value of SAR (measured) = 18.2 W/kg

### Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 59.482 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.84 W/kg; SAR(10 g) = 2.19 W/kg

Maximum value of SAR (measured) = 18.7 W/kg

# Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 58.886 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 36.9 W/kg

SAR(1 g) = 8.21 W/kg; SAR(10 g) = 2.28 W/kg

Maximum value of SAR (measured) = 20.1 W/kg

Certificate No: D5GHzV2-1104 Apr14

Page 13 of 15

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Page: 318 of 319

### Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 56.160 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 36.8 W/kg

SAR(1 g) = 7.73 W/kg; SAR(10 g) = 2.13 W/kg

Maximum value of SAR (measured) = 19.4 W/kg



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Page 14 of 15

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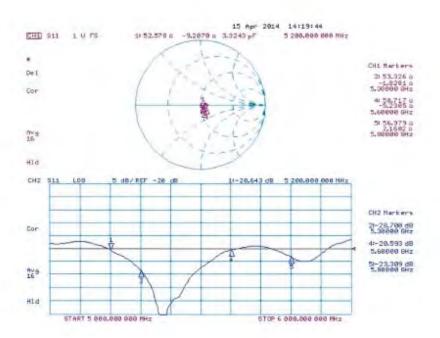
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Page: 319 of 319

### Impedance Measurement Plot for Body TSL



Certificate No: D5GHzV2-1104\_Apr14

Page 15 of 15

# End of 1st part of report

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