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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-0851-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-PM0851

Date of Receipt Nov. 10, 2014

Date of Test(s) Nov. 13, 2014 ~ Dec. 08, 2014

Date of Issue Jan. 16, 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 six 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.

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Signed on behalf of SGS					
Sr. Engineer	Supervisor				
Pin Chu	Ricky Huang				
Pin Chu	Ricky Huang				
Date: Jan. 16, 2015	Date: Jan. 16, 2015				

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SGS Taiwan Ltd.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803/新北市五股區新北產業園區五工路 134 號



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Version

Report Number	Revision	Description	Issue Date
EN/2014/B0011	00	Initial Version	Jan. 06, 2015
EN/2014/B0011	01	1 st modification	Jan. 09, 2015
EN/2014/B0011	02	2 nd modification	Jan. 16, 2015

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

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1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Electronics & Communication Laboratory			
No.134, Wu Kung Road, New Taipei Industrial Park			
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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1.3 Description of EUT

1.3 Description of EU) [
EUT Name	Mobile Phone				
Brand Name	Sony	Sony			
Type No.	PM-0851-BV				
HW Version	A				
SW Version	25.0.B.0.35				
	2G/3G: ZH8005X87T / ZH8005XC0T				
Serial No.	WLAN: ZH8005X8D9 / ZH8005XC00				
	LTE: ZH8005X8DD / ZH8005XC22				
	2G/3G: 004402453394748 / 00440	2453436606			
IMEI Code	WLAN: 004402453394672 / 004402	2453436705			
	LTE: 004402453394613 / 00440245	53436424			
FCC ID	PY7-PM0851				
	⊠GSM ⊠GPRS ⊠EDGE	⊠WCDMA ⊠HSDPA			
Mode of Operation	⊠HSUPA ⊠HSPA+ ⊠LTE FD	D			
	⊠WLAN802.11a/b/g/n(20M/40M)	⊠Bluetooth			
	GSM	1/8.3			
	GPRS (support multi class 12 max)	1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP) 1/8.3 (1Dn1UP)			
Duty Cycle	EDGE (support multi class 12 max)	1/0.3 (1Dn101) 1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 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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	GSM850	824.2		848.8
	GSM1900	1850.2		1909.8
	WCDMA Band II	1852.4		1907.6
	WCDMA Band V	826.4	_	846.6
	LTE FDD Band II	1850	_	1910
	LTE FDD Band V	824	_	849
	LTE FDD Band VII	2500	_	2570
	WLAN 802.11 b/g/n(20M)	2412	_	2462
	WLAN802.11 n 40M	2422	_	2452
	WLAN802.11 a 5.2G	5180	_	5240
TX Frequency Range	WLAN802.11 a 5.3G	5260	_	5320
(MHz)	WLAN802.11 a 5.5G	5500		5700
	WLAN802.11 a 5.8G	5745		5825
	WLAN802.11 n (20M) 5.2G	5180		5240
	WLAN802.11 n (20M) 5.3G	5260	_	5320
	WLAN802.11 n (20M) 5.5G	5500		5700
	WLAN802.11 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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	GSM850	128		251
	GSM1900	512		810
	WCDMA Band II	9262		9538
	WCDMA Band V	4132		4233
	LTE FDD Band II	18607		19193
	LTE FDD Band V	20415		20643
	LTE FDD Band VII	20775		21425
	WLAN 802.11 b/g/n(20M)	1	_	11
	WLAN802.11 n 40M	3		9
	WLAN802.11 a 5.2G	36		48
Channel Number	WLAN802.11 a 5.3G	52		64
(ARFCN).	WLAN802.11 a 5.5G	100		140
	WLAN802.11 a 5.8G	149		165
	WLAN802.11 n (20M) 5.2G	36		48
	WLAN802.11 n (20M) 5.3G	52		64
	WLAN802.11 n (20M) 5.5G	100		140
	WLAN802.11 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) 5.5G	102	_	134
	WLAN802.11 n (40M) 5.8G	151		159
	Bluetooth	0		78

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Max. SAR (1 g) (Unit: W/Kg)						
Mode	Band	Measured	Reported	Position / Channel		
	GSM 850	0.504	0.504			
	GSM 1900	0.187	0.191	☐Left ☐Right ☐Cheek ☐Tilt810 _Channel		
	WCDMA Band II	0.282	0.288			
Head	WCDMA Band V	0.451	0.462	□ Right □ Cheek □ Tilt		
	LTE FDD Band II	0.446	0.460			
	LTE FDD Band V	0.439	0.453	□ Right □ Cheek □ Tilt 20450		
	LTE FDD Band VII	0.247	0.249	☐Left ☐Right ☐Cheek ☐Tilt ☐ 21350 ☐Channel		

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Max. SAR (1 g) (Unit: W/Kg)						
Mode	Band	Measured	Reported	Position / Channel		
Head	WLAN802.11 b	0.514	0.525	☐Left ☐Right ☐Cheek ☐Tilt ☐ Channel — with Memory card		
	WLAN802.11 a 5.2G	0.204	0.215	☐Left ☐Right ☐Cheek ☐Tilt <u>48</u> Channel		
	WLAN802.11 a 5.3G	0.218	0.219	☐Left ☐Right ☐Cheek ☐Tilt 64 Channel		
	WLAN802.11 a 5.6G	0.410	0.411	☐Left ☐Right ☐Cheek ☐Tilt ☐ 132 ☐Channel		
	WLAN802.11 a 5.8G	0.491	0.518	□Left ⊠Right ⊠Cheek □Tilt 157Channel		

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Max. SAR (1 g) (Unit: W/Kg)						
Mode	Band	Measured	Reported	Position / Channel		
	GSM 850	0.353	0.353	☐Front ☐Back <u>251</u> Channel -With headset		
	GSM 1900	0.312	0.319	☐Front ⊠Back 810 Channel		
	WCDMA Band II	0.592	0.631	☐Front ☐Back 9400 Channel -With headset		
	WCDMA Band V	0.316	0.323	☐Front ☐Back 4123 Channel		
Body worn (speech	LTE FDD Band II	0.682	0.703	☐Front ☐Back 19100 Channel		
mode)	LTE FDD Band V	0.415	0.424	☐Front ☐Back 20600 Channel		
	LTE FDD Band VII	0.803	0.814	☐Front ☐Back 21100 Channel		
	WLAN802.11 a 5.2G	0.265	0.279	☐Front ☐Back 48 Channel		
	WLAN802.11 a 5.3G	0.270	0.271	☐Front ⊠Back 64 Channel		
	WLAN802.11 a 5.6G	0.388	0.389	☐Front ⊠Back 132 Channel		
	WLAN802.11 a 5.8G	0.346	0.356	☐Front ⊠Back 161 Channel		

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Max. SAR (1 g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GPRS 850 1Dn1UP	0.690	0.690	☐Front ☐Back ☐Bottom ☐Right ☐Left <u>251</u> Channel	
	GPRS 1900 1Dn1UP	0.616	0.630	☐Front ☐Back ☐Bottom ☐Right ☐Left810Channel	
	WCDMA Band II	1.120	1.143	☐Front ☐Back ☐Bottom ☐Right ☐Left 9538 Channel	
Hotspot mode	WCDMA Band V	0.788	0.790	☐Front ☐Back ☐Bottom ☐Right ☐Left 4132 Channel	
	LTE FDD Band II	1.260	1.298	Front Back Bottom Right Left 19100 Channel repeated at the highest SAR	
	LTE FDD Band V	0.534	0.545	☐Front ☐Back ☐Bottom ☐Right ☐Left	
	LTE FDD Band VII	1.160	1.171	☐Front ☐Back ☐Bottom ☐Right ☐Left21350 _Channel	
	WLAN802.11 b	0.546	0.549	☐Front ☐Back ☐Top ☐Right ☐Left <u>11</u> Channel	

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Type No. Difference: The difference between Type No.: PM-0851-BV (Dual SIM) and Type No.:

PM-0850-BV (Single SIM) is only in SIM slot and NFC feature.

PM-0850-BV: Single SIM, with NFC feature. PM-0851-BV: Dual SIM, without NFC feature.

<u>Measurement:</u> The verified SAR results of Type No.: PM-0851-BV (Dual SIM) were less than 20% of the worst cases of Type No.: PM-0850-BV (Single SIM).

Type No.: PM-0851-BV (Dual SIM) verified the worst cases of Type No.: PM-0850-BV (Single SIM)

Max. SAR (1 g) (Unit: W/Kg)

wax. SAR (1 g) (Unit: W/Rg)									
Mode	Band	Measured	Reported	Position / Channel					
	GSM 850	0.490	0.501						
	GSM 1900	0.205	0.210	☐Left ☐Right ☐Cheek ☐Tilt810 _Channel					
	WCDMA Band II	0.457	0.460	☐ Left☐ Right☐ Cheek☐ Tilt☐ 9538☐ Channel					
	WCDMA Band V	0.396	0.455	☐ Left☐ Right☐ Cheek☐ Tilt☐ 4233☐ Channel					
Head	LTE FDD Band II	0.495	0.500	<pre></pre>					
	LTE FDD Band V	0.460	0.470	☐Left ☐Right ☐Cheek ☐Tilt					
	LTE FDD Band VII	0.239	0.239	☐Left ☐Right ☐Cheek ☐TiltChannel					
	WLAN802.11 b	0.419	0.432	☐Left ☐Right ☐Cheek ☐Tilt ☐Channel					
	WLAN802.11 a 5.8G	0.401	0.413	☐Left ☐Right ☐Cheek ☐Tilt <u>157</u> Channel					

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Type No.: PM-0851-BV (Dual SIM) and Type No.:

PM-0850-BV (Single SIM) is only in SIM slot and NFC feature.

PM-0850-BV: Single SIM, with NFC feature. PM-0851-BV: Dual SIM, without NFC feature.

Measurement: The verified SAR results of Type No.: PM-0851-BV (Dual SIM) were less than 20% of the worst cases of Type No.: PM-0850-BV (Single SIM).

Type No.: PM-0851-BV (Dual SIM) verified the worst cases of Type No.: PM-0850-BV (Single SIM)

Max. SAR (1 g) (Unit: W/Kg)											
Mode	Band	Measured	Reported	Position / Channel							
	GSM 850	0.319	0.326	☐Front ⊠Back 251 Channel							
	GSM 1900	0.338	0.346	☐Front ⊠Back 810 Channel							
Body-worn	WCDMA Band II	0.524	0.528	☐Front ⊠Back 9538 Channe							
	WCDMA Band V	0.236	0.271	☐Front ⊠Back 4233 Channe							
	WLAN802.11 a 5.6G	0.361	0.372	☐Front ⊠Back 5660 Channe							

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Type No.: PM-0851-BV (Dual SIM) and Type No.:

PM-0850-BV (Single SIM) is only in SIM slot and NFC feature.

PM-0850-BV: Single SIM, with NFC feature. PM-0851-BV: Dual SIM, without NFC feature.

Measurement: The verified SAR results of Type No.: PM-0851-BV (Dual SIM) were less than 20%

of the worst cases of Type No.: PM-0850-BV (Single SIM).

of Type No. DM OOFO DV (Cinale CIM)

Type No.: PM-0851-BV (Dual SIM) verified the worst cases of Type No.: PM-0850-BV (Single SIM Max. SAR (1 g) (Unit: W/Kg)									
Mode	Band	Measured	Reported	Position / Channel					
	GSM 850	0.700	0.716	☐Front ☐Back ☐Bottom ☐Right ☐Left <u>251</u> Channel					
	GSM 1900	0.666	0.682	☐Front ☐Back ☐Bottom ☐Right ☐Left 810 Channel					
	WCDMA Band II	1.230	1.239	☐ Front ☐ Back ☐ Bottom ☐ Right ☐ Left ☐ 9538 Channel					
Hotspot mode	WCDMA Band V	0.680	0.744	☐Front ☐Back ☐Bottom ☐Right ☐Left 4233 Channel					
	LTE FDD Band II	1.360	1.373	Front Back Bottom Right Left 19100 Channel - repeated at the highest SAR					
	LTE FDD Band V	0.575	0.587	☐Front ☐Back ☐Bottom ☐Right ☐Left					
	LTE FDD Band VII	1.110	1.113	☐ Front ☐ Back☐ Bottom☐ Right☐ Left☐ Channel☐ C					

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Type No. Difference:	he difference between Type	No.: PM-0	851-BV (D	ual SIM) and Type No.:							
PM-0850-BV (Single SIM) is only in SIM slot and NFC feature.											
PM-0850-BV: Single SIM,	PM-0850-BV: Single SIM, with NFC feature.										
PM-0851-BV: Dual SIM, w	vithout NFC feature.										
Measurement: The verif	fied SAR results of Type No	.: PM-0851	-BV (Dual S	SIM) were less than 20%							
of the worst cases of Type	e No.: PM-0850-BV (Single	SIM).									
Type No.: PM-0851-BV (C	oual SIM) verified the worst	cases of Ty	pe No.: PN	M-0850-BV (Single SIM)							
,	Max. SAR (1 g) (l	Jnit: W/k	(g)	, g ,							
Mode	Band	Measured	Reported	Position / Channel							
Hotspot mode	WLAN802.11 b	0.574	0.585	☐Front ☐Back ☐Bottom ☐Right ☐Left 11 Channel							

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#. GSM/GPRS/EDGE conducted power table:

EUT mode	Frequency (MHz)	СН	Max. Rated Avg. Power + Max.	Burst average power	Source -based time average
			Tolerance	Avg. (dBm)	Avg. (dBm)
0014050	824.2	128	33.5	33.2	24.17
GSM850 (GMSK)	836.6	190	33.5	33.4	24.37
(GWISIK)	848.8	251	33.5	33.5	24.47
The	division fact	or compared	to the number	er of TX time	slot
	Divisio	1 TX ti	me slot		
	טואוטו		-9.03		

	Burst average power									
Max. Rated Avg	. Power + Max. 7	Tolerance (dBm)	33.5	30.5	28.5	27.5				
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP				
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)				
ODDCOFO	824.2	128	33.2	29.5	27.7	26.9				
GPRS850 (GMSK)	836.6	190	33.4	29.5	27.8	26.9				
(Giviort)	848.8	251	33.5	29.6	28	27.1				
		Source-bas	sed time aver	age power						
0000000	824.2	128	24.17	23.48	23.44	23.89				
GPRS850 (GMSK)	836.6	190	24.37	23.48	23.54	23.89				
(GIVIOIK)	848.8	251	24.47	23.58	23.74	24.09				
	The division factor compared to the number of TX time slot									
Division for the			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot				
'	Division facto	I	-9.03	-6.02	-4.26	-3.01				

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	Burst average power									
Max. Rated Avg	. Power + Max.	Folerance (dBm)	33.5	30.5	28.5	27.5				
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP				
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)				
FDOFOEO	824.2	128	33.2	29.5	27.7	26.9				
EDGE850 (MCS4)	836.6	190	33.4	29.5	27.8	26.9				
(111001)	848.8	251	33.4	29.5	27.8	27.1				
		Source-bas	sed time aver	age power						
ED 05050	824.2	128	24.17	23.48	23.44	23.89				
EDGE850 (MCS4)	836.6	190	24.37	23.48	23.54	23.89				
(111001)	848.8	251	24.37	23.48	23.54	24.09				
	The division factor compared to the number of TX time slot									
	Division facto	r	1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot				
	חואואוטו ומכנט	I	-9.03	-6.02	-4.26	-3.01				

	Burst average power								
Max. Rated Avg	. Power + Max. 7	Tolerance (dBm)	28	25.5	25	25			
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP			
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)			
FDOFOEO	824.2	128	27.6	25	25	25			
EDGE850 (MCS5)	836.6	190	27.5	25	25	25			
(111000)	848.8	251	27.7	25.1	25	25			
		Source-bas	sed time aver	age power					
ED 05050	824.2	128	18.57	18.98	20.74	21.99			
EDGE850 (MCS5)	836.6	190	18.47	18.98	20.74	21.99			
(111000)	848.8	251	18.67	19.08	20.74	21.99			
	The division factor compared to the number of TX time slot								
	Division factor			2 TX time slot	3 TX time slot	4 TX time slot			
	חוטוטוטויום ומכנט	I	-9.03	-6.02	-4.26	-3.01			

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	Burst average power									
Max. Rated Avg	. Power + Max.	Folerance (dBm)	28	25.5	25	25				
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP				
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)				
FDOFOEO	824.2	128	27.6	25	25	25				
EDGE850 (MCS9)	836.6	190	27.5	25	25	25				
(111007)	848.8	251	27.7	25.1	25	25				
		Source-bas	sed time aver	age power						
ED 05050	824.2	128	18.57	18.98	20.74	21.99				
EDGE850 (MCS9)	836.6	190	18.47	18.98	20.74	21.99				
(111007)	848.8	251	18.67	19.08	20.74	21.99				
	The division factor compared to the number of TX time slot									
	Division facto	r	1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot				
	טואואוטוז ומכנט	I	-9.03	-6.02	-4.26	-3.01				

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EUT mode	Frequency (MHz)	СН	Max. Rated Avg. Power + Max.	Burst average power	Source -based time average
			Tolerance	Avg. (dBm)	Avg. (dBm)
0014000	1850.2 512		30.5	30	20.97
GSM1900 (GMSK)	1800	661	30.5	30	20.97
(Giviory	1909.8	810	30.5	30.4	21.37
The	division fact	or compared	to the number	er of TX time	slot
	Divisio	1 TX ti	me slot		
	וואוטו	TIACIUI		-9.	.03

	Burst average power								
Max. Rated Avg	. Power + Max. 7	Tolerance (dBm)	30.5	27	25	24.5			
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP			
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)			
00004000	1850.2	512	30	26.5	24.7	23.8			
GPRS1900 (GMSK)	1800	661	30	26.5	24.7	23.8			
(GWISIT)	1909.8	810	30.4	26.6	24.8	24.3			
		Source-bas	sed time aver	age power					
00001000	1850.2	512	20.97	20.48	20.44	20.79			
GPRS1900 (GMSK)	1800	661	20.97	20.48	20.44	20.79			
(GWISIK)	1909.8	810	21.37	20.58	20.54	21.29			
	The division	n factor com	pared to the	number of T	X time slot				
	Division facto	r	1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot			
	חואואוטו ואכוט	l	-9.03	-6.02	-4.26	-3.01			

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	Burst average power									
Max. Rated Avg	. Power + Max.	Folerance (dBm)	30.5	27	25	24.5				
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP				
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)				
ED054000	1850.2	512	30.1	26.5	24.7	23.8				
EDGE1900 (MCS4)	1800	661	30	26.5	24.7	23.8				
(111001)	1909.8	810	30.4	26.6	24.8	24.1				
		Source-bas	sed time aver	age power						
ED 051000	1850.2	512	21.07	20.48	20.44	20.79				
EDGE1900 (MCS4)	1800	661	20.97	20.48	20.44	20.79				
(111001)	1909.8	810	21.37	20.58	20.54	21.09				
	The division factor compared to the number of TX time slot									
	Division fortun			2 TX time slot	3 TX time slot	4 TX time slot				
	Division facto	I	-9.03	-6.02	-4.26	-3.01				

		Burs	st average po	wer						
Max. Rated Avg	. Power + Max.	Folerance (dBm)	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)				
ED 054000	1850.2	512	27.2	24.3	23.2	22.2				
EDGE1900 (MCS5)	1800	661	27.2	24.3	23.3	22.2				
(111000)	1909.8	810	27.5	24.5	23.5	22.5				
		Source-bas	sed time aver	age power						
ED 051000	1850.2	512	18.17	18.28	18.94	19.19				
EDGE1900 (MCS5)	1800	661	18.17	18.28	19.04	19.19				
(111000)	1909.8	810	18.47	18.48	19.24	19.49				
	The division factor compared to the number of TX time slot									
	Division facto	r	1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot				
	ווטוצוויונועונעונעונעונעונעונע	! 	-9.03	-6.02	-4.26	-3.01				

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		Burs	st average po	ower						
Max. Rated Avg	. Power + Max.		<u> </u>	24.5	23.5	22.5				
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP				
EUT mode	Frequency (MHz)	СН	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)				
	1850.2	512	27.2	24.3	23.2	22.2				
(MCS9)	1800	661	27.2	24.3	23.3	22.2				
(10007)	1909.8	810	27.5	24.5	23.5	22.5				
		Source-bas	sed time aver	age power						
	1850.2	512	18.17	18.28	18.94	19.19				
EDGE1900 (MCS9)	1800	661	18.17	18.28	19.04	19.19				
(10007)	1909.8	810	18.47	18.48	19.24	19.49				
	The division factor compared to the number of TX time slot									
	Division facto	r	1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot				
!	Division facto	I	-9.03	-6.02	-4.26	-3.01				

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WCDMA Band II / Band V / HSDPA / HSUPA/ HSPA+_conducted power table:

		Max. Rated Avg. Power + Rel9		HSDPA mode AV(dBm)			HSUPA	mode A	V(dBm)		HSPA+ mode AV(dBm)						
Band	СН		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
MODAMA	9262	24.5	24.23	23.29	24.11	22.81	22.88	24.15	22.20	23.21	22.33	23.25	24.16	22.14	23.13	22.25	23.96
WCDMA Band II	9400	24.5	24.22	23.23	24.08	22.78	22.79	24.20	22.27	23.22	22.32	23.21	24.19	22.23	23.18	22.27	24.04
Danu II	9538	24.5	24.41	23.36	24.26	22.83	22.95	24.35	22.39	23.43	22.43	23.43	24.36	22.35	23.37	22.39	24.22
MODAMA	4132	24.5	24.35	23.44	24.42	22.98	23.03	24.45	22.51	23.19	22.56	23.42	24.32	22.35	23.30	22.38	24.13
WCDMA Band V	4183	24.5	24.31	23.35	24.37	22.87	22.91	24.41	22.49	23.17	22.55	23.39	24.23	22.25	23.23	22.31	24.00
Dallu V	4233	24.5	24.40	23.22	24.27	22.73	22.79	24.32	22.36	23.10	22.44	23.19	24.31	22.28	23.30	22.34	24.13

HSDPA

SUB-TEST	β_{c}	β_{d}	β _d (SF)	β_c/β_d	β _{HS} (<i>Note1, Note 2</i>)	CM (dB) (Note 3)	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

SUB-TEST	$eta_{ m c}$	eta_{d}	β _d (SF)	β _c /β _d	β _{HS} (Note1)	$eta_{ m ec}$	β _{ed} (Note 5) (Note 6)	β _{ed} (SF)	β _{ed} (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 _{ed} 1: 47/15 β _{ed} 2: 47/15	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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LTE FDD Band II / Band V/ Band VII power table:

1850.7 18607 23.96 24.5 0 1880 18900 24.10 24.5 0 1880 18900 24.10 24.5 0 199.3 19193 24.21 24.5 0 199.3 19193 24.21 24.5 0 199.3 19193 24.25 24.5 0 199.3 19193 24.25 24.5 0 199.3 19193 24.25 24.5 0 199.3 19193 24.25 24.5 0 199.3 19193 24.25 24.5 0 199.3 19193 24.33 24.5 0 199.3 19193 24.33 24.5 0 199.3 19193 24.33 24.5 0 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.39 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 199.3 19193 23.34 24 0.1 1880 18900 23.24 24 0.1 1880 18900 23.24 24 0.1 1880 18900 23.24 24 0.1 1880 18900 23.24 24 0.1 1880 18900 23.24 24 0.1 1880 18900 23.22 24 0.1 1880 18900 23.22 24 0.1 1880 18900 23.22 24 0.1 1880 18900 23.22 24 0.1 1880 18900 23.22 23 0.2 1850.7 18607 23.8 23 0.2 23 0.2 199.3 19193 22.29 23 0.2 199.3 19193 22.29 23 0.2 199.3 19193 22.29 23 0.2 199.3 19193 22.29 23 0.2 199.3 19193 22.28 23 0.2 199.3 199.3				LTE Band2	Conducted	power table			
1.4 180	BW (MHz)	Modulation	RB Size	RB Offset		Channel	Power	Power + Max.	Allowed per
144 1909.3 19193 24.21 24.5 0 1850.7 18607 24.05 24.5 0 1909.3 19193 24.25 24.5 0 1909.3 19193 24.25 24.5 0 1909.3 19193 24.25 24.5 0 1909.3 19193 24.25 24.5 0 1909.3 19193 24.33 24.5 0 1909.3 19193 24.33 24.5 0 1909.3 19193 24.33 24.5 0 1850.7 18607 23.14 24 0-1 1909.3 19193 23.40 24 0-1 1909.3 19193 23.40 24 0-1 1909.3 19193 23.39 24 0-1 1909.3 19193 23.39 24 0-1 1909.3 19193 23.39 24 0-1 1909.3 19193 23.38 24 0-1 1909.3 19193 23.38 24 0-1 1909.3 19193 23.38 24 0-1 1909.3 19193 23.34					1850.7	18607	23.96	24.5	0
1.4 1				0	1880	18900	24.01	24.5	0
1 2					1909.3	19193	24.21	24.5	0
1909.3 19193 24.25 24.5 0 1850.7 18607 23.95 24.5 0 1850.7 18607 23.95 24.5 0 1909.3 19193 24.33 24.5 0 1850.7 18607 23.14 24 0-1 1850.7 18607 23.14 24 0-1 1850.7 18607 23.14 24 0-1 1850.7 18607 23.15 24 0-1 1850.7 18607 23.15 24 0-1 1850.7 18607 23.15 24 0-1 1850.7 18607 23.15 24 0-1 1850.7 18607 23.16 24 0-1 1850.7 18607 23.16 24 0-1 1850.7 18607 23.16 24 0-1 1850.7 18607 23.16 24 0-1 1850.7 18607 23.16 24 0-1 1850.7 18607 23.18 24 0-1 1850.7 18607 23.18 24 0-1 1850.7 18607 23.18 24 0-1 1850.7 18607 23.20 24 0-1 1850.7 18607 23.20 24 0-1 1850.7 18607 23.20 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.04 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.00 23 0-2 1800 18900 22.86 23 0-2 1909.3 19193 22.96 23 0-2 1909.3 19193 22.96 23 0-2 1909.3 19193 22.86 23 0-2 1909.3 19193 22.86 23 0-2 1909.3 19193 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1909.3 19193 22.87 23 0-2 1909.3 19193 22.87 23 0-2 1909.3 19193 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1909.3 19193 22.86 23 0-2					1850.7	18607	24.05	24.5	0
1.4 1850.7 18607 23.95 24.5 0 1880 18900 24.03 24.5 0 1990.3 19193 24.33 24.5 0 1850.7 18607 23.14 24 0-1 1999.3 19193 23.34 24 0-1 1999.3 19193 23.30 24 0-1 1999.3 19193 23.39 24 0-1 1999.3 19193 23.39 24 0-1 1999.3 19193 23.39 24 0-1 1999.3 19193 23.38 24 0-1 1999.3 19193 23.38 24 0-1 1999.3 19193 23.38 24 0-1 1999.3 19193 23.38 24 0-1 1999.3 19193 23.34 24 0-1 1999.3 19193 23.34 24 0-1 1999.3 19193 23.34 24 0-1 1999.3 19193 23.34 24 0-1 1999.3 19193 23.30 24 0-1 1999.3 19193 23.30 24 0-1 1999.3 19193 23.30 24 0-1 1850.7 18607 23.01 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.00 23 0-2 1850.7 18607 23.00 23 0-2 1850.7 18607 23.00 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.86 23 0-2			1	2	1880	18900	24.15	24.5	0
1.4 Second Parison					1909.3	19193	24.25	24.5	0
1.4 1909.3					1850.7	18607	23.95	24.5	0
1.4 OPSK 0				5	1880	18900	24.03	24.5	0
1.4 OPSK O					1909.3	19193	24.33	24.5	0
1.4 1909.3					1850.7	18607	23.14	24	0-1
1.4 1850.7 18607 23.05 24		QPSK		0	1880	18900	23.22	24	0-1
1.4 1.4 180					1909.3	19193	23.40	24	0-1
1.4 1909.3					1850.7	18607	23.05	24	0-1
1.4 1850.7			3	2	1880	18900	23.15	24	0-1
1.4 1.4 1880 18900 23.18 24					1909.3	19193	23.39	24	0-1
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4					1850.7	18607	23.14	24	0-1
1.4 1.4 1.4				3	1880	18900	23.18	24	0-1
1.4 1.4 1.4					1909.3	19193	23.38	24	0-1
1.4 1909.3				0	1850.7	18607	23.20	24	0-1
1.4 1850.7			6		1880	18900	23.19	24	0-1
1850.7 18607 23.04 24 0-1 1880 18900 23.24 24 0-1 1909.3 19193 23.30 24 0-1 1850.7 18607 23.13 24 0-1 1850.7 18607 23.13 24 0-1 1909.3 19193 23.34 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.00 23 0-2 1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1850.7 18607 23.00 23 0-2 1909.3 19193 22.92 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2					1909.3	19193	23.34	24	0-1
1909.3 19193 23.30 24 0-1 1850.7 18607 23.13 24 0-1 1880 18900 23.33 24 0-1 1909.3 19193 23.34 24 0-1 1850.7 18607 23.03 24 0-1 1880 18900 23.22 24 0-1 1880 18900 23.22 24 0-1 1909.3 19193 23.24 24 0-1 1880 18900 23.22 24 0-1 1880 18900 23.22 24 0-1 1880 18900 23.22 24 0-1 1880 18900 23.22 24 0-1 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.18 23 0-2	1.4				1850.7	18607	23.04	24	0-1
1 2 1850.7 18607 23.13 24 0-1 1800 18900 23.33 24 0-1 1909.3 19193 23.34 24 0-1 1850.7 18607 23.03 24 0-1 1850.7 18607 23.03 24 0-1 1880 18900 23.22 24 0-1 1909.3 19193 23.24 24 0-1 1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2				О	1880	18900	23.24	24	0-1
1 2 1880 18900 23.33 24 0-1 1909.3 19193 23.34 24 0-1 1850.7 18607 23.03 24 0-1 1909.3 19193 23.22 24 0-1 1909.3 19193 23.24 24 0-1 1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1880 18900 22.81 23 0-2 1880 18900 22.81 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2					1909.3	19193	23.30	24	0-1
1909.3 19193 23.34 24 0-1 1850.7 18607 23.03 24 0-1 1880 18900 23.22 24 0-1 1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.18 23 0-2					1850.7	18607	23.13	24	0-1
1850.7 18607 23.03 24 0-1 1880 18900 23.22 24 0-1 1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1850.7 18607 22.88 23 0-2 1909.3 19193 22.94 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2			1	2	1880	18900	23.33	24	0-1
16QAM 1880 18900 23.22 24 0-1 1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1909.3 19193 22.97 23 0-2 1850.7 18607 22.88 23 0-2 1880 18900 22.81 23 0-2 1909.3 19193 22.94 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2					1909.3	19193	23.34	24	0-1
1909.3 19193 23.24 24 0-1 1850.7 18607 23.00 23 0-2 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 18909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.96 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.86 23 0-2 1850.7 18607 22.18 23 0-2					1850.7	18607	23.03	24	0-1
16QAM 0				5	1880	18900	23.22	24	0-1
16QAM 0 1880 18900 22.97 23 0-2 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1880 18900 22.81 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 3 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2					1909.3	19193	23.24	24	0-1
3 1909.3 19193 22.92 23 0-2 1850.7 18607 22.88 23 0-2 1880 18900 22.81 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1909.3 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2					1850.7	18607	23.00	23	0-2
3 2 1850.7 18607 22.88 23 0-2 1880 18900 22.81 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 1850.7 18607 22.18 23 0-2		16QAM		О	1880	18900	22.97	23	0-2
3 2 1880 18900 22.81 23 0-2 1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2					1909.3	19193	22.92	23	0-2
1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 3 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2					1850.7	18607		23	0-2
1909.3 19193 22.94 23 0-2 1850.7 18607 22.96 23 0-2 3 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2			3	2	1880	18900	22.81	23	0-2
3 1850.7 18607 22.96 23 0-2 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2					1909.3	19193	22.94	23	0-2
3 1880 18900 22.86 23 0-2 1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2					1850.7	18607			0-2
1909.3 19193 22.87 23 0-2 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2				3					
6 0 1850.7 18607 22.18 23 0-2 6 0 1880 18900 22.36 23 0-2									
6 0 1880 18900 22.36 23 0-2									
			6	О					
1909.3 19193 22.51 23 0-2					1909.3	19193	22.51	23	0-2

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			LTE Band?	Conducted	nower table			
			LIL Bandz	Conducted	power table		Target	
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Power + Max. Tolerance	MPR Allowed per 3GPP(dB)
				1851.5	18615	24.07	24.5	0
			0	1880	18900	24.08	24.5	0
				1908.5	19185	24.18	24.5	0
				1851.5	18615	24.02	24.5	0
		1	7	1880	18900	24.05	24.5	0
				1908.5	19185	24.27	24.5	0
				1851.5	18615	24.02	24.5	0
			14	1880	18900	24.06	24.5	0
				1908.5	19185	24.31	24.5	0
				1851.5	18615	23.14	24	0-1
	QPSK		0	1880	18900	23.19	24	0-1
				1908.5	19185	23.43	24	0-1
				1851.5	18615	23.09	24	0-1
		8	4	1880	18900	23.17	24	0-1
				1908.5	19185	23.36	24	0-1
				1851.5	18615	23.13	24	0-1
			7	1880	18900	23.19	24	0-1
				1908.5	19185	23.43	24	0-1
				1851.5	18615	23.11	24	0-1
		15	0	1880	18900	23.13	24	0-1
3				1908.5	19185	23.35	24	0-1
				1851.5	18615	23.08	24	0-1
			0	1880	18900	23.03	24	0-1
				1908.5	19185	23.11	24	0-1
				1851.5	18615	23.15	24	0-1
		1	7	1880	18900	23.03	24	0-1
				1908.5	19185	23.05	24	0-1
				1851.5	18615	23.1	24	0-1
			14	1880	18900	23.07	24	0-1
				1908.5	19185	23.04	24	0-1
				1851.5	18615	22.27	23	0-2
	16QAM		0	1880	18900	22.34	23	0-2
				1908.5	19185	22.49	23	0-2
				1851.5	18615	22.29	23	0-2
		8	4	1880	18900	22.31	23	0-2
				1908.5	19185	22.46	23	0-2
				1851.5	18615	22.3	23	0-2
			7	1880	18900	22.32	23	0-2
				1908.5	19185	22.47	23	0-2
				1851.5	18615	22.19	23	0-2
		15	0	1880	18900	22.22	23	0-2
		10		1908.5	19185	22.39	23	0-2

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			LTE Band?	Conducted	nower table				
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)	
				1922.5	18025	24.14	24.5	0	
			0	1880	18900	24.08	24.5	0	
				1907.5	19175	24.22	24.5	0	
				1922.5	18025	24.09	24.5	0	
		1	12	1880	18900	24.07	24.5	0	
				1907.5	19175	24.27	24.5	0	
				1922.5	18025	24.05	24.5	0	
			24	1880	18900	24.15	24.5	0	
				1907.5	19175	24.29	24.5	0	
				1922.5	18025	23.12	24	0-1	
	QPSK		0	1880	18900	23.22	24	0-1	
				1907.5	19175	23.31	24	0-1	
				1922.5	18025	23.14	24	0-1	
		12	6	1880	18900	23.17	24	0-1	
				1907.5	19175	23.37	24	0-1	
				1922.5	18025	23.12	24	0-1	
			13	1880	18900	23.22	24	0-1	
				1907.5	19175	23.44	24	0-1	
				1922.5	18025	23.09	24	0-1	
		25	0	1880	18900	23.2	24	0-1	
5				1907.5	19175	23.39	24	0-1	
				1922.5	18025	23.39	24	0-1	
			0	1880	18900	23.47	24	0-1	
				1907.5	19175	23.47	24	0-1	
				1922.5	18025	23.39	24	0-1	
		1	12	1880	18900	23.32	24	0-1	
				1907.5	19175	23.49	24	0-1	
				1922.5	18025	23.4	24	0-1	
			24	1880	18900	23.41	24	0-1	
				1907.5	19175	23.42	24	0-1	
	400444			1922.5	18025	22.15	23	0-2	
	16QAM		0	1880	18900	22.27	23	0-2	
				1907.5	19175	22.47	23	0-2	
		10		1922.5	18025	22.12	23	0-2	
		12	6	1880	18900	22.26	23	0-2	
				1907.5	19175	22.45	23	0-2	
			12	1922.5	18025	22.26	23	0-2	
			13	1880	18900	22.29	23	0-2	
l				1907.5	19175	22.39	23	0-2	
ĺ		25	0	1922.5	18025	22.1	23	0-2	
		20	l	1880	18900	22.16	23	0-2	
		20	25		1907.5	19175	22.36	23	0-2

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	LTE Band2 Conducted power table											
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)				
				1855	18650	24.13	24.5	0				
			0	1880	18900	24.14	24.5	0				
				1905	19150	24.17	24.5	0				
				1855	18650	24.03	24.5	0				
		1	25	1880	18900	24.14	24.5	0				
				1905	19150	24.17	24.5	0				
				1855	18650	24.06	24.5	0				
			49	1880	18900	24.17	24.5	0				
				1905	19150	24.29	24.5	0				
				1855	18650	23.15	24	0-1				
	QPSK		0	1880	18900	23.17	24	0-1				
				1905	19150	23.4	24	0-1				
				1855	18650	23.11	24	0-1				
		25	12	1880	18900	23.25	24	0-1				
				1905	19150	23.37	24	0-1				
				1855	18650	23.08	24	0-1				
			25	1880	18900	23.26	24	0-1				
				1905	19150	23.42	24	0-1				
			О	1855	18650	23.26	24	0-1				
		50		1880	18900	23.24	24	0-1				
10				1905	19150	23.39	24	0-1				
				1855	18650	23.52	24	0-1				
			0	1880	18900	23.24	24	0-1				
				1905	19150	23.28	24	0-1				
		_		1855	18650	23.52	24	0-1				
		1	25	1880	18900	23.28	24	0-1				
				1905	19150	23.45	24	0-1				
				1855	18650	23.56	24	0-1				
			49	1880	18900	23.58	24	0-1				
				1905	19150	23.34	24	0-1				
	160011			1855	18650	22.18	23	0-2				
	16QAM		0	1880	18900	22.27	23	0-2				
				1905	19150	22.41	23	0-2				
		25	12	1855	18650	22.16	23	0-2				
		25	'	1880	18900 19150	22.25	23	0-2				
				1905 1855	18650	22.46	23	0-2 0-2				
			25	1880	18900	22.15 22.29	23	0-2				
				1905	19150	22.29	23	0-2				
				1855	18650	22.24	23	0-2				
		50	0	1880	18900	22.24	23	0-2				
		50	l		19150		23	0-2				
				1905	19150	22.44	∠3	0-2				

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			I TF Band2	Conducted	nower table			
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)
				1857.5	18675	24.1	24.5	0
			0	1880	18900	24.08	24.5	0
				1902.5	19125	24.19	24.5	0
				1857.5	18675	24.01	24.5	0
		1	36	1880	18900	24.1	24.5	0
				1902.5	19125	24.28	24.5	0
				1857.5	18675	24.02	24.5	0
			74	1880	18900	24.21	24.5	0
				1902.5	19125	24.36	24.5	0
				1857.5	18675	23.2	24	0-1
	QPSK		0	1880	18900	23.12	24	0-1
				1902.5	19125	23.32	24	0-1
				1857.5	18675	23.19	24	0-1
		36	18	1880	18900	23.21	24	0-1
				1902.5	19125	23.27	24	0-1
				1857.5	18675	23.2	24	0-1
			37	1880	18900	23.23	24	0-1
				1902.5	19125	23.43	24	0-1
		75	o	1857.5	18675	23.17	24	0-1
				1880	18900	23.17	24	0-1
15				1902.5	19125	23.39	24	0-1
				1857.5	18675	23.24	24	0-1
			0	1880	18900	23.31	24	0-1
				1902.5	19125	23.17	24	0-1
				1857.5	18675	23.22	24	0-1
		1	36	1880	18900	23.27	24	0-1
				1902.5	19125	23.29	24	0-1
				1857.5	18675	23.24	24	0-1
			74	1880	18900	23.24	24	0-1
				1902.5	19125	23.41	24	0-1
	160011		0	1857.5	18675	22.19	23	0-2
	16QAM		0	1880	18900	22.25	23	0-2
				1902.5	19125	22.33	23	0-2
		36	18	1857.5	18675	22.16	23	0-2
		30	'8	1880	18900	22.24	23	0-2
				1902.5 1857.5	19125	22.4	23	0-2
			37	1857.5	18675	22.2	23	0-2
			31	1880 1902.5	18900	22.25	23 23	0-2 0-2
1				1857.5	19125 18675	22.45	23	0-2
		75	0	1880	18900	22.17 22.24	23	0-2
		, 5						0-2
l				1902.5	19125	22.4	23	0-2

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	LTE Band2 Conducted power table											
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)				
				1860	18700	24.11	24.5	0				
			0	1880	18900	24.07	24.5	0				
				1900	19100	24.18	24.5	0				
				1860	18700	24.06	24.5	0				
		1	50	1880	18900	24.09	24.5	0				
				1900	19100	24.22	24.5	0				
				1860	18700	24.16	24.5	0				
			99	1880	18900	24.17	24.5	0				
				1900	19100	24.37	24.5	0				
				1860	18700	23.15	24	0-1				
	QPSK		0	1880	18900	23.15	24	0-1				
				1900	19100	23.32	24	0-1				
				1860	18700	23.15	24	0-1				
		50	25	1880	18900	23.14	24	0-1				
				1900	19100	23.33	24	0-1				
				1860	18700	23.17	24	0-1				
			50	1880	18900	23.31	24	0-1				
				1900	19100	23.42	24	0-1				
			0	1860	18700	23.12	24	0-1				
		100		1880	18900	23.14	24	0-1				
20				1900	19100	23.37	24	0-1				
				1860	18700	23.51	24	0-1				
			0	1880	18900	23.39	24	0-1				
				1900	19100	23.32	24	0-1				
				1860	18700	23.5	24	0-1				
		1	50	1880	18900	23.17	24	0-1				
				1900	19100	23.39	24	0-1				
				1860	18700	23.57	24	0-1				
			99	1880	18900	23.48	24	0-1				
				1900	19100	23.26	24	0-1				
				1860	18700	22.18	23	0-2				
	16QAM		0	1880	18900	22.17	23	0-2				
				1900	19100	22.24	23	0-2				
		5 0		1860	18700	22.21	23	0-2				
		50	25	1880	18900	22.17	23	0-2				
				1900	19100	22.26	23	0-2				
			F.0	1860	18700	22.25	23	0-2				
			50	1880	18900	22.24	23	0-2				
				1900	19100	22.37	23	0-2				
		400		1860	18700	22.2	23	0-2				
		100	0	1880	18900	22.16	23	0-2				
				1900	19100	22.29	23	0-2				

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			LTF Rand5	Conducted	nower table			
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)
				824.7	20407	24.2	24.5	0
			0	836.5	20525	24.15	24.5	0
				848.3	20643	24.27	24.5	0
				824.7	20407	24.25	24.5	0
		1	2	836.5	20525	24.25	24.5	0
				848.3	20643	24.29	24.5	0
				824.7	20407	24.14	24.5	0
			5	836.5	20525	24.17	24.5	0
				848.3	20643	24.22	24.5	0
				824.7	20407	23.23	24	0-1
	QPSK		0	836.5	20525	23.20	24	0-1
				848.3	20643	23.27	24	0-1
				824.7	20407	23.17	24	0-1
		3	2	836.5	20525	23.10	24	0-1
				848.3	20643	23.19	24	0-1
				824.7	20407	23.21	24	0-1
			3	836.5	20525	23.18	24	0-1
				848.3	20643	23.25	24	0-1
		6		824.7	20407	23.25	24	0-1
			0	836.5	20525	23.21	24	0-1
1.4				848.3	20643	23.22	24	0-1
				824.7	20407	23.4	24	0-1
			0	836.5	20525	23.36	24	0-1
				848.3	20643	23.45	24	0-1
				824.7	20407	23.49	24	0-1
		1	2	836.5	20525	23.5	24	0-1
				848.3	20643	23.51	24	0-1
				824.7	20407	23.36	24	0-1
			5	836.5	20525	23.43	24	0-1
				848.3	20643	23.43	24	0-1
				824.7	20407	22.26	23	0-2
	16QAM		0	836.5	20525	22.27	23	0-2
				848.3	20643	22.30	23	0-2
		6		824.7	20407	22.26	23	0-2
		3	2	836.5	20525	22.19	23	0-2
				848.3	20643	22.26	23	0-2
				824.7	20407	22.27	23	0-2
			3	836.5	20525	22.22	23	0-2
				848.3	20643	22.28	23	0-2
		6		824.7	20407	22.3	23	0-2
		6	0	836.5	20525	22.3	23	0-2
				848.3	20643	22.33	23	0-2

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LTE Band5 Conducted power table										
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)		
				825.5	20415	24.26	24.5	0		
			0	836.5	20525	24.14	24.5	0		
				847.5	20635	24.25	24.5	0		
				825.5	20415	24.23	24.5	0		
		1	7	836.5	20525	24.1	24.5	0		
				847.5	20635	24.25	24.5	0		
				825.5	20415	24.24	24.5	0		
			14	836.5	20525	24.1	24.5	0		
				847.5	20635	24.19	24.5	0		
				825.5	20415	23.36	24	0-1		
	QPSK		0	836.5	20525	23.22	24	0-1		
				847.5	20635	23.34	24	0-1		
				825.5	20415	23.28	24	0-1		
		8	4	836.5	20525	23.2	24	0-1		
				847.5	20635	23.3	24	0-1		
			7	825.5	20415	23.35	24	0-1		
				836.5	20525	23.22	24	0-1		
				847.5	20635	23.3	24	0-1		
		15	0	825.5	20415	23.3	24	0-1		
				836.5	20525	23.22	24	0-1		
3				847.5	20635	23.3	24	0-1		
3		1	О	825.5	20415	23.31	24	0-1		
				836.5	20525	23.17	24	0-1		
				847.5	20635	23.28	24	0-1		
			7	825.5	20415	23.34	24	0-1		
				836.5	20525	23.21	24	0-1		
				847.5	20635	23.32	24	0-1		
			14	825.5	20415	23.29	24	0-1		
				836.5	20525	23.21	24	0-1		
				847.5	20635	23.26	24	0-1		
				825.5	20415	22.39	23	0-2		
	16QAM		0	836.5	20525	22.28	23	0-2		
				847.5	20635	22.39	23	0-2		
				825.5	20415	22.37	23	0-2		
		8	4	836.5	20525	22.29	23	0-2		
				847.5	20635	22.37	23	0-2		
				825.5	20415	22.4	23	0-2		
			7	836.5	20525	22.31	23	0-2		
				847.5	20635	22.44	23	0-2		
1				825.5	20415	22.28	23	0-2		
1		15	О	836.5	20525	22.18	23	0-2		
				847.5	20635	22.33	23	0-2		

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			LTF Rand5	Conducted	nower table			
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)
				826.5	20425	24.37	24.5	0
			0	836.5	20525	24.25	24.5	0
				846.5	20625	24.4	24.5	0
				826.5	20425	24.31	24.5	0
		1	12	836.5	20525	24.25	24.5	0
				846.5	20625	24.35	24.5	0
				826.5	20425	24.33	24.5	0
			24	836.5	20525	24.24	24.5	0
				846.5	20625	24.31	24.5	0
				826.5	20425	23.4	24	0-1
	QPSK		0	836.5	20525	23.26	24	0-1
				846.5	20625	23.35	24	0-1
				826.5	20425	23.3	24	0-1
		12	6	836.5	20525	23.23	24	0-1
				846.5	20625	23.33	24	0-1
			13	826.5	20425	23.37	24	0-1
				836.5	20525	23.25	24	0-1
				846.5	20625	23.3	24	0-1
			О	826.5	20425	23.27	24	0-1
		25		836.5	20525	23.21	24	0-1
5				846.5	20625	23.3	24	0-1
J			O	826.5	20425	23.54	24	0-1
				836.5	20525	23.38	24	0-1
				846.5	20625	23.53	24	0-1
		1	12	826.5	20425	23.5	24	0-1
				836.5	20525	23.42	24	0-1
				846.5	20625	23.5	24	0-1
			24	826.5	20425	23.4	24	0-1
				836.5	20525	23.4	24	0-1
				846.5	20625	23.39	24	0-1
				826.5	20425	22.46	23	0-2
	16QAM		0	836.5	20525	22.41	23	0-2
				846.5	20625	22.46	23	0-2
				826.5	20425	22.44	23	0-2
		12	6	836.5	20525	22.36	23	0-2
				846.5	20625	22.44	23	0-2
				826.5	20425	22.42	23	0-2
			13	836.5	20525	22.4	23	0-2
ĺ				846.5	20625	22.44	23	0-2
1		_		826.5	20425	22.41	23	0-2
1		25	0	836.5	20525	22.35	23	0-2
				846.5	20625	22.37	23	0-2

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			LTF Rand5	LTE Band5 Conducted power table										
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)						
				829	20450	24.36	24.5	0						
			0	836.5	20525	24.28	24.5	0						
				844	20600	24.35	24.5	0						
				829	20450	24.34	24.5	0						
		1	25	836.5	20525	24.32	24.5	0						
				844	20600	24.39	24.5	0						
				829	20450	24.28	24.5	0						
			49	836.5	20525	24.37	24.5	0						
				844	20600	24.41	24.5	0						
				829	20450	23.46	24	0-1						
	QPSK		0	836.5	20525	23.46	24	0-1						
				844	20600	23.44	24	0-1						
				829	20450	23.47	24	0-1						
		25	12	836.5	20525	23.44	24	0-1						
				844	20600	23.48	24	0-1						
			25	829	20450	23.48	24	0-1						
				836.5	20525	23.50	24	0-1						
				844	20600	23.51	24	0-1						
		50	0	829	20450	23.51	24	0-1						
				836.5	20525	23.50	24	0-1						
10				844	20600	23.49	24	0-1						
		1 25		829	20450	23.3	24	0-1						
			0	836.5	20525	23.21	24	0-1						
				844	20600	23.72	24	0-1						
			25	829	20450	23.3	24	0-1						
				836.5	20525	23.3	24	0-1						
				844	20600	23.75	24	0-1						
			49	829	20450	23.27	24	0-1						
				836.5	20525	23.37	24	0-1						
				844	20600	23.62	24	0-1						
	16QAM		0	829	20450	22.44	23	0-2						
	IOQAIVI		0	836.5	20525	22.44	23	0-2						
				844 829	20600	22.57	23	0-2 0-2						
		25	12	836.5	20525	22.44 22.46	23 23	0-2						
		20	12	844	20600	22.46	23	0-2						
				829	20450	22.44	23	0-2						
			25	836.5	20525	22.49	23	0-2						
				844	20600	22.55	23	0-2						
				829	20450	22.52	23	0-2						
		50	0	836.5	20525	22.52	23	0-2						
1		- -		844	20600	22.54	23	0-2						
				- 5-4-4	20000	22.54		5 -∠						

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			LTE Band7	Conducted	power table			
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)
				2502.5	20775	22.28	22.5	0
			0	2535	21100	22.27	22.5	0
				2567.5	21425	22.18	22.5	0
				2502.5	20775	22.24	22.5	0
		1	12	2535	21100	22.25	22.5	0
				2567.5	21425	22.26	22.5	0
				2502.5	20775	22.27	22.5	0
			24	2535	21100	22.29	22.5	0
				2567.5	21425	22.28	22.5	0
				2502.5	20775	21.29	22	0-1
	QPSK		0	2535	21100	21.21	22	0-1
				2567.5	21425	21.26	22	0-1
				2502.5	20775	21.29	22	0-1
		12	6	2535	21100	21.28	22	0-1
				2567.5	21425	21.29	22	0-1
			13	2502.5	20775	21.30	22	0-1
				2535	21100	21.29	22	0-1
				2567.5	21425	21.32	22	0-1
		25	O	2502.5	20775	21.32	22	0-1
				2535	21100	21.33	22	0-1
5				2567.5	21425	21.29	22	0-1
J			О	2502.5	20775	21.61	22	0-1
				2535	21100	21.71	22	0-1
				2567.5	21425	21.29	22	0-1
		1	12	2502.5	20775	21.80	22	0-1
				2535	21100	21.48	22	0-1
				2567.5	21425	21.40	22	0-1
			24	2502.5	20775	21.85	22	0-1
				2535	21100	21.83	22	0-1
				2567.5	21425	21.45	22	0-1
				2502.5	20775	20.25	21	0-2
	16QAM		0	2535	21100	20.22	21	0-2
				2567.5	21425	20.27	21	0-2
				2502.5	20775	20.23	21	0-2
		12	6	2535	21100	20.23	21	0-2
				2567.5	21425	20.26	21	0-2
				2502.5	20775	20.28	21	0-2
			13	2535	21100	20.22	21	0-2
				2567.5	21425	20.34	21	0-2
				2502.5	20775	20.27	21	0-2
		25	0	2535	21100	20.26	21	0-2
				2567.5	21425	20.26	21	0-2

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LTE Band7 Conducted power table									
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)	
				2505	20800	22.02	22.5	0	
			О	2535	21100	22.09	22.5	0	
				2565	21400	22.18	22.5	0	
				2505	20800	22.06	22.5	0	
		1	25	2535	21100	22.19	22.5	0	
				2565	21400	22.18	22.5	0	
				2505	20800	22.13	22.5	0	
			49	2535	21100	22.28	22.5	0	
				2565	21400	22.29	22.5	0	
				2505	20800	21.09	22	0-1	
	QPSK		0	2535	21100	21.21	22	0-1	
				2565	21400	21.23	22	0-1	
				2505	20800	21.14	22	0-1	
		25 50	12	2535	21100	21.22	22	0-1	
				2565	21400	21.26	22	0-1	
			25	2505	20800	21.30	22	0-1	
				2535	21100	21.28	22	0-1	
				2565	21400	21.31	22	0-1	
			О	2505	20800	21.15	22	0-1	
				2535	21100	21.21	22	0-1	
10				2565	21400	21.23	22	0-1	
			0	2505	20800	21.27	22	0-1	
				2535	21100	21.32	22	0-1	
				2565	21400	21.36	22	0-1	
		1	25	2505	20800	21.28	22	0-1	
				2535	21100	21.45	22	0-1	
				2565	21400	21.39	22	0-1	
			49	2505 2535	20800	21.34 21.62	22	0-1 0-1	
			1 43	2565	21400	21.69	22	0-1	
				2505	20800	20.14	21	0-1	
	16QAM		0	2535	21100	20.14	21	0-2	
	100/11/1		I	2565	21400	20.12	21	0-2	
				2505	20800	20.14	21	0-2	
		25	12	2535	21100	20.16	21	0-2	
			1	2565	21400	20.16	21	0-2	
				2505	20800	20.10	21	0-2	
			25	2535	21100	20.10	21	0-2	
				2565	21400	20.21	21	0-2	
			†	2505	20800	20.11	21	0-2	
		50	0	2535	21100	20.18	21	0-2	
		50	l	2565	21400	20.19	21	0-2	

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	LTE Band7 Conducted power table										
			LIL Ballu7	Conducted	power table		Target				
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Power + Max. Tolerance	MPR Allowed per 3GPP(dB)			
				2507.5	20825	21.92	22.5	0			
			0	2535	21100	21.99	22.5	0			
				2562.5	21375	22.08	22.5	0			
				2507.5	20825	21.96	22.5	0			
		1	36	2535	21100	22.09	22.5	0			
				2562.5	21375	22.08	22.5	0			
				2507.5	20825	22.03	22.5	0			
			74	2535	21100	22.19	22.5	0			
				2562.5	21375	22.22	22.5	0			
				2507.5	20825	20.99	22	0-1			
	QPSK		0	2535	21100	21.11	22	0-1			
				2562.5	21375	21.13	22	0-1			
				2507.5	20825	21.04	22	0-1			
		36 75	18	2535	21100	21.12	22	0-1			
				2562.5	21375	21.16	22	0-1			
			37	2507.5	20825	21.2	22	0-1			
				2535	21100	21.18	22	0-1			
				2562.5	21375	21.21	22	0-1			
			o	2507.5	20825	21.05	22	0-1			
				2535	21100	21.11	22	0-1			
15				2562.5	21375	21.13	22	0-1			
10		1 36 74		2507.5	20825	21.17	22	0-1			
			2535	21100	21.22	22	0-1				
				2562.5	21375	21.26	22	0-1			
			36	2507.5	20825	21.18	22	0-1			
				2535	21100	21.35	22	0-1			
				2562.5	21375	21.29	22	0-1			
				2507.5	20825	21.24	22	0-1			
			74	2535	21100	21.52	22	0-1			
				2562.5	21375	21.59	22	0-1			
				2507.5	20825	20.04	21	0-2			
	16QAM		0	2535	21100	20.02	21	0-2			
				2562.5	21375	20.04	21	0-2			
				2507.5	20825	20.30	21	0-2			
		36	18	2535	21100	20.06	21	0-2			
				2562.5	21375	20.06	21	0-2			
				2507.5	20825	20	21	0-2			
			37	2535	21100	20.12	21	0-2			
				2562.5	21375	20.11	21	0-2			
			1	2507.5	20825	20.01	21	0-2			
		75	0	2535	21100	20.08	21	0-2			
				2562.5	21375	20.09	21	0-2			

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	LTE Band7 Conducted power table									
BW (MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted Power (dBm)	Target Power + Max. Tolerance	MPR Allowed per 3GPP(dB)		
				2510	20850	22.01	22.3	0		
			0	2535	21100	22.08	22.3	0		
				2560	21350	22.10	22.3	0		
				2510	20850	22.02	22.3	0		
		1	50	2535	21100	22.14	22.3	0		
				2560	21350	22.18	22.3	0		
				2510	20850	22.17	22.3	0		
			99	2535	21100	22.24	22.3	0		
				2560	21350	22.26	22.3	0		
				2510	20850	21.19	22	0-1		
	QPSK		0	2535	21100	21.21	22	0-1		
				2560	21350	21.25	22	0-1		
				2510	20850	21.18	22	0-1		
		50	25	2535	21100	21.22	22	0-1		
				2560	21350	21.28	22	0-1		
			50	2510	20850	21.25	22	0-1		
				2535	21100	21.32	22	0-1		
				2560	21350	21.37	22	0-1		
		100	0	2510	20850	21.15	22	0-1		
				2535	21100	21.20	22	0-1		
20				2560	21350	21.30	22	0-1		
			0	2510	20850	21.61	22	0-1		
				2535	21100	21.29	22	0-1		
				2560	21350	21.26	22	0-1		
		1	50	2510	20850	21.34	22	0-1		
				2535	21100	21.26	22	0-1		
				2560	21350	21.65	22	0-1		
				2510	20850	21.71	22	0-1		
			99	2535	21100	21.89	22	0-1		
				2560	21350	21.98	22	0-1		
	16001			2510	20850	20.15	21	0-2		
	16QAM		0	2535	21100	20.10	21	0-2		
				2560	21350	20.24	21	0-2		
		50	25	2510	20850	20.11	21 21	0-2		
		30	25	2535	21100	20.19	21	0-2 0-2		
				2560 2510	21350 20850	20.28	21	0-2		
			50	2510	21100	20.16	21			
				2535	21350	20.23	21	0-2 0-2		
								0-2		
		100	0	2510 2535	20850	20.10	21			
		100	l		21100	1	21	0-2		
				2560	21350	20.26	21	0-2		

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

802.	11 b	Max. Rated	Av	verage Power	Output (dBN	M)
	F	Avg. Power +		Data Rat	ta Rate (Mbps)	
СН	Frequency (MHz)	Max. Tolerance	1	2	5.5	11
1	2412	16	15.71	15.65	15.51	15.44
6	2437	16	15.91	15.88	15.82	15.71
11	2462	16	15.98	15.92	15.84	15.77

802.	.11 g	Max. Rated			A	verage Power	r Output (dBN	Л)		
	_	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	6	9	12	18	24	36	48	54
1	2412	15	14.66	14.59	14.53	14.5	14.45	14.34	14.27	14.2
6	2437	15	14.99	14.92	14.87	14.84	14.74	14.64	14.5	14.44
11	2462	15	14.5	14.42	14.38	14.33	14.32	14.22	14.18	14.08

802.11	n (20M)	Max. Rated			A	verage Power	Output (dBN	Л)		
	F	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	6.5	13	19.5	26	39	52	58.5	65
1	2412	11.5	11.37	11.28	11.18	11.14	11.01	10.94	10.55	10.52
6	2437	11.5	11.19	11.08	10.97	10.91	10.84	10.72	10.67	10.55
11	2462	11.5	11.11	11.02	10.96	10.88	10.75	10.7	10.64	10.55

802	.11 n (40M)	Max. Rated			A	Average Power Output (dBM)				
	-	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	13.5	27	40.5	54	81	108	121.5	135
3	2422	11.5	11.25	11.18	11.09	11.01	10.95	10.87	10.82	10.75
6	2437	11.5	11.24	11.1	11.01	10.88	10.84	10.74	10.66	10.62
9	2452	11.5	11.33	11.21	11.18	11.08	10.99	10.87	10.82	10.77

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802.11 n 5	5.2G (20M)	Max. Rated	Average Power Output (dBM)								
	F	Avg. Power +				Data Rat	e (Mbps)				
СН	Frequency (MHz)	Max. Tolerance	6.5	13	19.5	26	39	52	58.5	65	
36	5180	13	12.75	12.72	12.69	12.65	12.63	12.59	12.57	12.51	
40	5200	13	12.75	12.65	12.57	12.51	12.45	12.41	12.35	12.26	
44	5220	13	12.69	12.55	12.5	12.42	12.37	12.31	12.24	12.17	
48	5240	13	12.77	12.71	12.64	12.53	12.41	12.32	12.28	12.14	

802.11 n 5	3.3G (20M)	Max. Rated	Average Power Output (dBM)								
	F	Avg. Power +				Data Rat	e (Mbps)				
СН	Frequency (MHz)	Max. Tolerance	6.5	13	19.5	26	39	52	58.5	65	
52	5260	13	12.9	12.84	12.73	12.62	12.54	12.47	12.33	12.15	
56	5280	13	12.43	12.37	12.33	12.27	12.21	12.17	12.11	12.05	
60	5300	13	12.48	12.42	12.35	12.27	12.25	12.21	12.17	12.09	
64	5320	13	12.58	12.54	12.42	12.38	12.25	12.21	12.12	12.07	

802.11 n 5	5.6G (20M)	Max. Rated			A	verage Power	Output (dBN	Л)		
	_	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	6.5	13	19.5	26	39	52	58.5	65
100	5500	13	12.72	12.63	12.58	12.44	12.39	12.24	12.17	12.02
104	5520	13	12.74	12.67	12.53	12.45	12.42	12.35	12.33	12.25
108	5540	13	12.85	12.74	12.62	12.44	12.38	12.22	12.17	12.05
112	5560	13	12.77	12.69	12.61	12.56	12.44	12.37	12.24	12.15
116	5580	13	12.81	12.75	12.64	12.51	12.47	12.35	12.28	12.18
132	5660	13	12.99	12.87	12.77	12.54	12.31	12.17	12.08	12.01
136	5680	13	12.97	12.85	12.74	12.62	12.51	12.42	12.38	12.21
140	5700	13	12.74	12.67	12.52	12.42	12.34	12.25	12.12	12.07

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802.11 n 5	5.8G (20M)	Max. Rated			A	verage Power	Output (dBN	N)		
	-	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	6.5	13	19.5	26	39	52	58.5	65
149	5745	13	12.79	12.62	12.54	12.41	12.37	12.21	12.19	12.11
153	5765	13	12.87	12.81	12.74	12.61	12.52	12.47	12.4	12.25
157	5785	13	12.98	12.87	12.81	12.75	12.64	12.57	12.51	12.42
161	5805	13	12.7	12.64	12.55	12.43	12.38	12.31	12.25	12.17
165	5825	13	12.81	12.74	12.62	12.54	12.41	12.37	12.32	12.24

802.11 n 5	5.2G (40M)				Av	verage Power	Output (dBN	N)		
	F	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	13.5	27	40.5	54	81	108	121.5	135
38	5190	10.5	10.27	10.22	10.16	10.09	10.01	9.92	9.83	9.71
46	5230	12	11.98	11.91	11.82	11.74	11.63	11.54	11.41	11.35

802.11 n 5	5.3G (40M)	Max. Rated			A	verage Power	Output (dBN	Л)		
	_	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	13.5	27	40.5	54	81	108	121.5	135
54	5270	12	11.86	11.79	11.72	11.63	11.53	11.44	11.35	11.21
62	5310	11.5	11.41	11.32	11.25	11.11	11.02	10.93	10.81	10.76

802.11 n 5	5.6G (40M)	Max. Rated			Av	verage Power	Output (dBN	Л)		
	F	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	13.5	27	40.5	54	81	108	121.5	135
102	5510	11.5	11.26	11.18	11.1	11.02	10.96	10.81	10.73	10.62
110	5550	12	11.84	11.74	11.63	11.59	11.51	11.43	11.36	11.21
134	5670	12	11.98	11.88	11.82	11.77	11.69	11.54	11.45	11.36

802.11 n 5	5.8G (40M)	Max. Rated			Av	erage Power	Output (dBN	Л)		
	F	Avg. Power +				Data Rat	e (Mbps)			
СН	Frequency (MHz)	Max. Tolerance	13.5	27	40.5	54	81	108	121.5	135
151	5755	12	11.69	11.62	11.57	11.45	11.36	11.29	11.21	11.15
159	5795	12	11.94	11.86	11.72	11.65	11.59	11.46	11.35	11.28

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802.11	802.11 a 5.2G		Average Power Output (dBM)									
	_	Avg. Power +		Data Rate (Mbps)								
СН	Frequency (MHz)	Max. Tolerance	6	9	12	18	24	36	48	54		
36	5180	14	13.76	13.69	13.65	13.52	13.51	13.44	13.33	13.29		
40	5200	14	13.66	13.61	13.54	13.47	13.42	13.35	13.27	13.21		
44	5220	14	13.3	13.21	12.19	13.17	13.15	13.1	13.07	13.01		
48	5240	14	13.77	13.71	13.64	13.55	13.48	13.28	13.1	13.05		

802.11	802.11 a 5.3G		Average Power Output (dBM)									
	CH Frequency (MHz) Avg. Max. Tolerand	ŭ		Data Rate (Mbps)								
СН			6	9	12	18	24	36	48	54		
52	5260	14	13.84	13.75	13.62	13.57	13.48	13.45	13.35	12.33		
56	5280	14	13.89	13.78	13.61	13.52	13.42	13.37	13.22	13.15		
60	5300	14	13.4	13.36	13.3	13.27	13.24	13.18	13.15	13.08		
64	5320	14	13.99	13.94	13.85	13.72	13.67	13.59	13.45	13.34		

802.11	802.11 a 5.6G				A	verage Power	Output (dBN	Л)			
	CH Frequency (MHz)	Avg. Power +	Data Rate (Mbps)								
СН		Max. Tolerance	6	9	12	18	24	36	48	54	
100	5500	14	13.71	13.65	13.54	13.48	13.31	13.29	13.22	13.17	
104	5520	14	13.64	13.57	13.42	13.34	13.28	13.21	13.14	13.05	
108	5540	14	13.72	13.64	13.53	13.42	13.38	13.25	13.14	13.03	
112	5560	14	13.76	13.71	13.65	13.54	13.41	13.32	13.25	13.16	
116	5580	14	13.44	13.35	13.28	13.22	13.17	13.14	13.11	13.03	
132	5660	14	13.99	13.92	13.84	13.74	13.61	13.53	13.47	13.36	
136	5680	14	13.97	13.74	13.62	13.51	13.41	13.32	13.17	13.05	
140	5700	14	13.68	13.57	13.51	13.42	13.32	13.25	13.14	13.11	

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802.11	802.11 a 5.8G			Average Power Output (dBM)								
	_	Avg. Power +		Data Rate (Mbps)								
СН	Frequency (MHz)	Cy Man	6	9	12	18	24	36	48	54		
149	5745	14	13.7	13.62	13.54	13.42	13.33	13.28	13.22	13.14		
153	5765	14	13.78	13.71	13.64	13.51	13.35	13.27	13.17	13.08		
157	5785	14	13.77	13.64	13.57	13.42	13.39	13.24	13.23	13.18		
161	5805	14	13.88	13.72	13.65	13.55	13.48	13.35	13.31	13.24		
165	5825	14	13.62	13.57	13.52	13.47	13.36	13.28	13.18	13.01		

#. Bluetooth conducted power table:

Frequency	Peak (dBm)						
(MHz)	BR-DH5	ER-2DH5	ER-3DH5				
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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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.
- 2. 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/V, LTE Band 2/5/7 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 refered 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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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.

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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)	Maximum Power (dBm)	Separation Distance (Body) (mm)	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.
- 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 ≤ 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.

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- 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 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

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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 (MH410C) 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 ≤ 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 ≤ 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 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 ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit)

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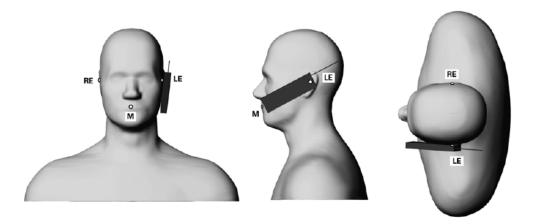
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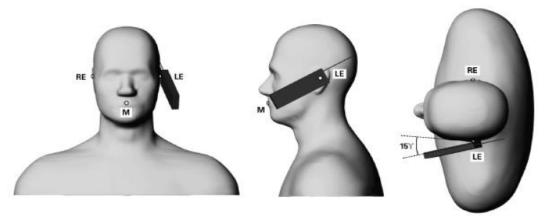


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1.6 Positioning Procedure



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

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the mouth with respect to the test device reference point by 15 degrees.

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

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is based on splines in two or three dimensions. The procedure can find the maximum for 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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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 σ is the conductivity, ρ 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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• 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 ρ), 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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- 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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- [1] N. Kuster, Q. Balzano, and J.C. Lin, Eds., *Mobile Communications Safety*, Chapman & Hall, London, 1997.
- [2] K. Meier, M. Burkhardt, T. Schmid, and N. Kuster, \Broadband calibration of E-field probes in lossy media", IEEE Transactions on Microwave Theory and Techniques, vol. 44, no. 10, pp. 1954{1962, Oct. 1996.
- [3] K. Jokela, P. Hyysalo, and L. Puranen, \Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", IEEE Transactions on Instrumentation and Measurements, vol. 47, no. 2, pp. 432{438, Apr. 1998.

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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= σ (|Ei|²)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

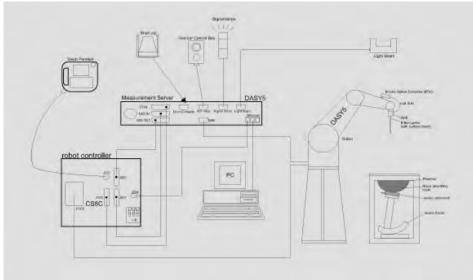


Fig. a A block diagram of the SAR measurement system

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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.
- 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 Windows7
- 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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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
	HSL835/1900/2450/2600/5200/5300/5600/5800MHz
	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 μ W/g to > 100 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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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: 850 mm;

> Length: 1000 mm; Width: 500 mm



DEVICE HOLDER

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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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 KDB865664D01v01r03) from the target SAR values.

These tests were done at 850/1900/2450/2600/5200/5300/5600/5800 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° C, the relative humidity was 62% and the liquid depth above the ear reference points was above 15 cm ($\leq 3G$) 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.

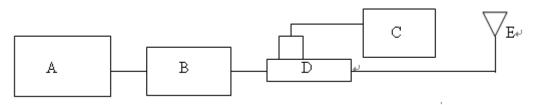
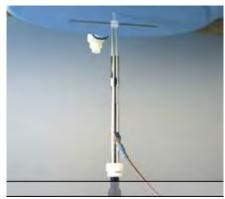


Fig. b The block diagram of system verification

- 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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Validation Kit	S/N	Frequency (MHz)		Target SAR (1g) (Pin=250mW) (mW/g)	Measured SAR (1g)(mW/g)	Deviation (%)	Measured Date
D835V2	4d063	835	Head	2.47	2.34	5.26%	Nov 13,2014
D835V2	4d063	835	Body	2.41	2.42	-0.41%	Nov 15,2014
D1900V2	5d027	1900	Head	9.71	9.77	-0.62%	Nov 14,2014
D1900V2	5d027	1900	Body	10.1	9.81	2.87%	Nov 15,2014
D835V2	4d063	835	Head	2.47	2.36	4.45%	Nov 18,2014
D835V2	4d063	835	Body	2.41	2.37	1.66%	Nov 19,2014
D835V2	4d063	835	Head	2.47	2.37	4.05%	Dec 08,2014
D835V2	4d063	835	Body	2.41	2.36	2.07%	Dec 08,2014
D1900V2	5d027	1900	Head	9.71	9.95	-2.47%	Nov 20,2014
D1900V2	5d027	1900	Body	10.1	10.1	0.00%	Nov 24,2014
D1900V2	5d027	1900	Head	9.71	9.84	-1.34%	Dec 08,2014
D1900V2	5d027	1900	Body	10.1	9.95	1.49%	Dec 08,2014
D2450V2	922	2450	Head	13.3	13.4	-0.75%	Nov 23,2014
D2450V2	922	2450	Body	12.9	13.1	-1.55%	Nov 23,2014
D2600V2	1005	2600	Head	14.7	15.1	-2.72%	Nov 22,2014
D2600V2	1005	2600	Body	14.3	14.7	-2.80%	Nov 27,2014
D2600V2	1005	2600	Head	14.7	15	-2.04%	Dec 08,2014
D2600V2	1005	2600	Body	14.3	14.6	-2.10%	Dec 08,2014
D5GHzV2	1104	5200	Head	8.27	8.37	-1.21%	Nov 17,2014
D5GHzV2	1104	5200	Body	7.64	7.59	0.65%	Nov 19,2014
D5GHzV2	1104	5300	Head	8.51	8.32	2.23%	Nov 18,2014
D5GHzV2	1104	5300	Body	7.77	7.83	-0.77%	Nov 19,2014
D5GHzV2	1104	5600	Head	8.62	8.74	-1.39%	Nov 17,2014
D5GHzV2	1104	5600	Body	8.25	8.4	-1.82%	Nov 19,2014
D5GHzV2	1104	5800	Head	8.09	8.11	-0.25%	Nov 18,2014
D5GHzV2	1104	5800	Body	7.6	7.72	-1.58%	Nov 19,2014

Table 1. System validation (follow manufacture target value)

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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)

Measuremen t Date	Measured Frequency (MHz)	Tissue Type	Target Dielectric Constant,	Target Conductivit y, g (S/m)	Measured Dielectric Constant,	Measured Conductivit y, g (S/m)	% dev εr	% dev σ
	824.2		41.56	0.90	41.28	0.87	0.65%	3.00%
2014/11/13	826.4	1	41.55	0.90	41.26	0.87	0.69%	2.78%
	835	1	41.50	0.90	41.15	0.88	0.85%	1.89%
2014/12/8	835		41.50	0.90	40.23	0.88	3.06%	2.33%
	836.6		41.50	0.90	41.12	0.89	0.91%	1.88%
2014/11/13	846.6	1	41.50	0.91	41.00	0.89	1.21%	1.97%
	848.8	Hood	41.50	0.92	40.97	0.90	1.28%	2.08%
	1850.2	Head	40.00	1.40	39.75	1.34	0.62%	4.43%
2014/11/14	1852.4		40.00	1.40	39.74	1.34	0.65%	4.29%
2014/11/14	1880		40.00	1.40	39.65	1.39	0.88%	0.79%
	1900		40.00	1.40	39.57	1.39	1.08%	0.79%
2014/12/8	1900		40.00	1.40	39.36	1.44	1.61%	-2.50%
2014/11/14	1907.6	40.00	1.40	39.54	1.42	1.16%	-1.21%	
2014/11/14	1909.8		40.00	1.40	39.53	1.40	1.18%	0.07%
	824.2		55.24	0.97	52.97	1.00	4.11%	-3.30%
2014/11/15	826.4		55.23	0.97	52.95	1.00	4.13%	-3.51%
	835		55.20	0.97	52.88	1.01	4.21%	-4.33%
2014/12/8	835		55.20	0.97	53.35	0.96	3.35%	1.03%
	836.6		55.20	0.97	52.86	1.01	4.23%	-4.32%
	846.6		55.16	0.98	52.77	1.03	4.34%	-4.17%
	848.8	Dody	55.16	0.99	52.75	1.03	4.36%	-4.05%
	1850.2	Body	53.30	1.52	51.87	1.45	2.68%	4.80%
2014/11/15	1852.4		53.30	1.52	51.86	1.45	2.70%	4.67%
2014/11/15	1880		53.30	1.52	51.69	1.47	3.02%	3.09%
	1900		53.30	1.52	51.60	1.50	3.20%	1.51%
	1900		53.30	1.52	54.17	1.56	-1.62%	-2.37%
	1907.6		53.30	1.52	51.58	1.51	3.23%	0.86%
	1909.8		53.30	1.52	51.58	1.51	3.23%	0.72%

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Measuremen t Date	Measured Frequency (MHz)	Tissue Type	Target Dielectric Constant,	Target Conductivit y, g (S/m)	Measured Dielectric Constant,	Measured Conductivit y, g (S/m)	% dev εr	% dev σ
	829		41.53	0.90	40.24	0.88	3.12%	2.67%
2014/11/18	835	Head	41.50	0.90	40.23	0.88	3.06%	2.33%
2014/11/10	836.6	ricau	41.50	0.90	40.23	0.88	3.06%	2.55%
	844		41.50	0.91	40.17	0.88	3.21%	2.86%
	829		55.22	0.97	53.75	0.98	2.66%	-0.72%
2014/11/19	835	Body	55.20	0.97	53.66	0.98	2.78%	-1.13%
2014/11/19	836.6	Body	55.20	0.97	53.65	0.98	2.81%	-1.23%
	844		55.17	0.98	53.57	0.99	2.90%	-1.02%
	1860		40.00	1.40	39.41	1.42	1.49%	-1.36%
2014/11/20	1880	Head	40.00	1.40	39.35	1.42	1.63%	-1.71%
	1900		40.00	1.40	39.26	1.43	1.86%	-2.29%
	1860		53.30	1.52	54.41	1.52	-2.08%	-0.07%
2014/11/24	1880	Body	53.30	1.52	52.24	1.54	1.98%	-1.12%
	1900		53.30	1.52	54.07	1.55	-1.44%	-2.11%
	2510		39.12	1.87	40.77	1.90	-4.21%	-1.88%
2014/11/22	2535		39.09	1.89	40.63	1.93	-3.93%	-1.80%
2014/11/22	2560	Head	39.06	1.92	40.49	1.95	-3.65%	-1.46%
	2600		39.01	1.96	40.38	1.98	-3.52%	-0.87%
2014/12/8	2600		39.01	1.96	40.38	1.96	-3.52%	0.15%
	2510		52.62	2.04	53.13	2.00	-0.96%	1.52%
2014/11/27	2535		52.59	2.07	52.99	2.02	-0.76%	2.51%
2014/11/27	2560	Body	52.56	2.11	52.81	2.04	-0.48%	2.94%
	2600		52.51	2.16	52.598	2.071	-0.17%	4.25%
2014/12/8	2600		52.51	2.16	52.598	2.071	-0.17%	4.25%
	2412		39.27	1.77	39.30	1.78	-0.08%	-0.72%
	2437	الممط	39.22	1.79	39.23	1.81	-0.02%	-1.09%
	2450	Head	39.20	1.80	39.19	1.82	0.04%	-1.28%
2014/44/22	2462	1	39.18	1.81	39.12	1.84	0.17%	-1.26%
2014/11/23	2412		52.75	1.91	50.24	1.99	4.77%	-4.09%
	2437	De etc.	52.72	1.94	50.14	2.03	4.89%	-4.62%
	2450	Body	52.70	1.95	50.10	2.05	4.93%	-4.87%
	2462		52.68	1.97	50.06	2.06	4.98%	-4.88%

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Measurement Date	Measured Frequency (MHz)	Tissue Type	Target Dielectric Constant, Er	Target Conductivity, σ (S/m)	Measured Dielectric Constant, Er	Measured Conductivity, σ (S/m)	% dev εr	% dev σ
	5180		36.01	4.63	36.13	4.59	-0.33%	0.98%
2014/11/17	5200		35.99	4.66	36.07	4.62	-0.25%	0.79%
	5240		35.94	4.70	36.07	4.67	-0.37%	0.60%
	5280		35.89	4.74	35.89	4.71	0.01%	0.68%
2014/11/18	5300		35.87	4.76	35.83	4.73	0.12%	0.56%
	5320]	35.85	4.78	35.80	4.77	0.14%	0.23%
	5540]	35.60	5.00	35.29	5.02	0.87%	-0.27%
0044/44/47	5600	Head	35.53	5.07	35.14	5.08	1.09%	-0.32%
2014/11/17	5660		35.46	5.13	35.03	5.15	1.21%	-0.52%
	5680		35.44	5.15	34.98	5.18	1.28%	-0.68%
	5765		35.34	5.23	34.76	5.28	1.65%	-0.80%
0014/11/10	5785		35.32	5.25	34.72	5.31	1.68%	-0.96%
2014/11/18	5800		35.30	5.27	34.70	5.32	1.70%	-0.85%
	5805		35.29	5.28	34.68	5.32	1.75%	-0.87%
	5180		49.04	5.28	48.66	5.39	0.78%	-2.22%
	5200		49.01	5.30	48.60	5.41	0.84%	-2.03%
	5240		48.96	5.35	48.35	5.47	1.25%	-2.39%
	5280	1	48.91	5.39	48.36	5.56	1.11%	-3.03%
	5300	1	48.88	5.42	48.32	5.57	1.14%	-2.86%
	5320	1	48.85	5.44	48.20	5.59	1.34%	-2.77%
0044/44/40	5540	1	48.55	5.70	47.54	5.95	2.09%	-4.36%
2014/11/19	5600	Body	48.47	5.77	47.50	6.04	2.00%	-4.76%
	5660	1	48.39	5.84	47.18	6.06	2.50%	-3.80%
	5680	1	48.36	5.86	47.19	6.04	2.43%	-3.11%
	5765		48.25	5.96	46.91	6.16	2.78%	-3.39%
	5785		48.22	5.98	46.91	6.18	2.72%	-3.37%
	5800	1	48.20	6.00	46.94	6.20	2.61%	-3.33%
	5805	1	48.19	6.01	46.94	6.21	2.61%	-3.45%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

-			Ü	Ingre	edient			Takal
Frequency (MHz)	Mode	DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	Total amount
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)
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)
0.450	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	_	_		_	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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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

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or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(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:

- Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
- 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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2. Summary of Results

GSM 850 MHz

					Max. Rated Avg.			Averaged S	AR over 1g /kg)	
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	Re Cheek	-	251	848.8	33.50	33.50	0.00%	0.420	0.420	-
	Re Tilt	-	251	848.8	33.50	33.50	0.00%	0.220	0.220	-
GSM850	Le Cheek	-	128	824.2	33.50	33.20	7.15%	0.383	0.410	-
(GMSK) (Head)	Le Cheek	-	190	836.6	33.50	33.40	2.33%	0.441	0.451	-
(1111)	Le Cheek	-	251	848.8	33.50	33.50	0.00%	0.504	0.504	93
	Le Tilt	-	251	848.8	33.50	33.50	0.00%	0.225	0.225	-
GSM850	Front side	15mm	251	848.8	33.50	33.50	0.00%	0.262	0.262	-
(GMSK)	Back side	15mm	128	824.2	33.50	33.20	7.15%	0.230	0.246	-
(Speech	Back side	15mm	190	836.6	33.50	33.40	2.33%	0.292	0.299	-
mode)	Back side	15mm	251	848.8	33.50	33.50	0.00%	0.353	0.353	94
	Front side	10mm	251	848.8	33.50	33.50	0.00%	0.512	0.512	-
	Back side	10mm	128	824.2	33.50	33.20	7.15%	0.461	0.494	-
GPRS850	Back side	10mm	190	836.6	33.50	33.40	2.33%	0.580	0.594	-
(GMSK)	Back side	10mm	251	848.8	33.50	33.50	0.00%	0.690	0.690	95
(Hotspot)	Bottom side	10mm	251	848.8	33.50	33.50	0.00%	0.209	0.209	-
	Right side	10mm	251	848.8	33.50	33.50	0.00%	0.216	0.216	-
	Left side	10mm	251	848.8	33.50	33.50	0.00%	0.463	0.463	-

Type No.: PM-0851-BV (Dual SIM):

					Max. Rated Avg.	Measured		Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
GSM850 (GMSK) (Head)	Le Cheek	-	251	848.8	33.50	33.40	2.33%	0.490	0.501	96
GSM850 (GMSK) (Speech mode)	Back side	15mm	251	848.8	33.50	33.40	2.33%	0.319	0.326	97
GPRS850 (GMSK) (Hotspot)	Back side	10mm	251	848.8	33.50	33.40	2.33%	0.700	0.716	98

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GSM 1900 MHz

					Max. Rated Avg.			Averaged S		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	Re Cheek	-	512	1850.2	30.50	30.00	12.20%	0.140	0.157	-
	Re Cheek	-	661	1880	30.50	30.00	12.20%	0.132	0.148	-
GSM1900 (GMSK)	Re Cheek	-	810	1909.8	30.50	30.40	2.33%	0.187	0.191	99
(GIVISK) (Head)	Re Tilt	ı	810	1909.8	30.50	30.40	2.33%	0.072	0.074	-
	Le Cheek	-	810	1909.8	30.50	30.40	2.33%	0.163	0.167	-
	Le Tilt	-	810	1909.8	30.50	30.40	2.33%	0.069	0.071	-
GSM1900	Front side	15mm	810	1909.8	30.50	30.40	2.33%	0.222	0.227	-
(GMSK)	Back side	15mm	512	1850.2	30.50	30.00	12.20%	0.265	0.297	-
(Speech mode)	Back side	15mm	661	1880	30.50	30.00	12.20%	0.283	0.318	-
mode)	Back side	15mm	810	1909.8	30.50	30.40	2.33%	0.312	0.319	100
	Front side	10mm	810	1909.8	30.50	30.40	2.33%	0.422	0.432	-
	Back side	10mm	810	1909.8	30.50	30.40	2.33%	0.582	0.596	-
GPRS1900	Bottom side	10mm	512	1850.2	30.50	30.00	12.20%	0.453	0.508	-
(GMSK)	Bottom side	10mm	661	1880	30.50	30.00	12.20%	0.511	0.573	-
(Hotspot)	Bottom side	10mm	810	1909.8	30.50	30.40	2.33%	0.616	0.630	101
	Right side	10mm	810	1909.8	30.50	30.40	2.33%	0.117	0.120	-
	Left side	10mm	810	1909.8	30.50	30.40	2.33%	0.107	0.109	-

Type No.: PM-0851-BV (Dual SIM):

					Max. Rated Avg.			Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
GSM1900 (GMSK) (Head)	Re Cheek	-	810	1909.8	30.50	30.40	2.33%	0.205	0.210	102
GSM1900 (GMSK) (Speech mode)	Back side	15mm	810	1909.8	30.50	30.40	2.33%	0.338	0.346	103
GPRS1900 (GMSK) (Hotspot)	Bottom side	10mm	810	1909.8	30.50	30.40	2.33%	0.666	0.682	104

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WCDMA Band II

					Max. Rated Avg.			Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	Re Cheek	-	9538	1907.6	24.50	24.41	2.09%	0.237	0.242	-
	Re Tilt	-	9538	1907.6	24.50	24.41	2.09%	0.110	0.112	-
R99	Le Cheek	-	9262	1852.4	24.50	24.23	6.41%	0.182	0.194	-
(Head)	Le Cheek	-	9400	1880	24.50	24.22	6.66%	0.219	0.234	-
	Le Cheek	-	9538	1907.6	24.50	24.41	2.09%	0.282	0.288	105
	Le Tilt	-	9538	1907.6	24.50	24.41	2.09%	0.118	0.120	-
R99	Front side	15mm	9538	1907.6	24.50	24.41	2.09%	0.407	0.416	-
(Body-worn	Back side	15mm	9262	1852.4	24.50	24.23	6.41%	0.552	0.587	-
speech	Back side	15mm	9400	1880	24.50	24.22	6.66%	0.592	0.631	106
mode)	Back side	15mm	9538	1907.6	24.50	24.41	2.09%	0.607	0.620	-
	Front side	10mm	9538	1907.6	24.50	24.41	2.09%	0.743	0.759	-
	Back side	10mm	9262	1852.4	24.50	24.23	6.41%	0.892	0.949	-
	Back side	10mm	9400	1880	24.50	24.22	6.66%	0.928	0.990	-
	Back side	10mm	9538	1907.6	24.50	24.41	2.09%	1.040	1.062	-
R99	Bottom side	10mm	9262	1852.4	24.50	24.23	6.41%	0.908	0.966	-
(Hotspot)	Bottom side	10mm	9400	1880	24.50	24.22	6.66%	0.975	1.040	-
	Bottom side	10mm	9538	1907.6	24.50	24.41	2.09%	1.120	1.143	107
	Bottom side*	10mm	9538	1907.6	24.50	24.41	2.09%	1.110	1.133	-
	Right	10mm	9538	1907.6	24.50	24.41	2.09%	0.211	0.215	-
	Left	10mm	9538	1907.6	24.50	24.41	2.09%	0.186	0.190	-

^{* -} repeated at the highest SAR measurement according to the KDB 865664 D01v01r03

Type No.: PM-0851-BV (Dual SIM):

					Max. Rated Avg.			Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
R99 (Head)	Le Cheek	-	9538	1907.6	24.50	24.47	0.69%	0.457	0.460	108
R99 (Body-worn speech mode)	Back side	15mm	9538	1907.6	24.50	24.47	0.69%	0.524	0.528	109
R99 (Hotspot)	Bottom side	10mm	9538	1907.6	24.50	24.47	0.69%	1.230	1.239	110

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WCDMA Band V

					Max. Rated Avg.			Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	Re Cheek	-	4132	826.4	24.50	24.49	0.23%	0.360	0.361	-
	Re Tilt	-	4132	826.4	24.50	24.49	0.23%	0.208	0.208	-
R99	Le Cheek	-	4132	826.4	24.50	24.49	0.23%	0.435	0.436	-
(Head)	Le Cheek	-	4183	836.6	24.50	24.48	0.46%	0.420	0.422	-
	Le Cheek	-	4233	846.6	24.50	24.40	2.33%	0.451	0.462	111
	Le Tilt	-	4132	826.4	24.50	24.49	0.23%	0.220	0.221	-
R99	Front side	15mm	4132	826.4	24.50	24.49	0.23%	0.201	0.201	-
(Body-worn	Back side	15mm	4132	826.4	24.50	24.49	0.23%	0.259	0.260	-
speech mode)	Back side	15mm	4183	836.6	24.50	24.48	0.46%	0.246	0.247	-
mode)	Back side	15mm	4123	846.6	24.50	24.40	2.33%	0.316	0.323	112
	Front side	10mm	4132	826.4	24.50	24.49	0.23%	0.528	0.529	-
	Back side	10mm	4132	826.4	24.50	24.49	0.23%	0.788	0.790	113
	Back side	10mm	4183	836.6	24.50	24.48	0.46%	0.742	0.745	-
R99	Back side	10mm	4233	846.6	24.50	24.40	2.33%	0.757	0.775	-
(Hotspot)	Bottom side	10mm	4132	826.4	24.50	24.49	0.23%	0.191	0.191	-
	Right side	10mm	4132	826.4	24.50	24.49	0.23%	0.232	0.233	-
	Left side	10mm	4132	826.4	24.50	24.49	0.23%	0.466	0.467	-

Type No.: PM-0851-BV (Dual SIM):

					Max. Rated Avg.			Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
R99 (Head)	Le Cheek	-	4233	846.6	24.50	23.90	14.82%	0.396	0.455	114
R99 (Body-worn speech mode)	Back side	15mm	4233	846.6	24.50	23.90	14.82%	0.236	0.271	115
R99 (Hotspot)	Back side	10mm	4233	846.6	24.50	24.11	9.40%	0.680	0.744	116

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LTE FDD Band II

								_	Max. Rated	Measured		Averaged 1g (V	SAR over V/kg)					
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page				
					Re Cheek	-	19100	1900	24.5	24.37	3.04%	0.403	0.415	-				
					Re Tilt	-	19100	1900	24.5	24.37	3.04%	0.190	0.196	-				
			1	99	Le Cheek	1	18700	1860	24.5	24.16	8.14%	0.326	0.353	-				
			ı	99	Le Cheek	1	18900	1880	24.5	24.17	7.89%	0.385	0.415	-				
					Le Cheek	1	19100	1900	24.5	24.37	3.04%	0.446	0.460	117				
					Le Tilt	1	19100	1900	24.5	24.37	3.04%	0.158	0.163	-				
Band2	20Mbz	hz QPSK			Re Cheek	-	19100	1900	24	23.42	14.29%	0.320	0.366	-				
(Head)	(Head) 20Mhz QPSK	QPSK	50	50 50	Re Tilt	-	19100	1900	24	23.42	14.29%	0.153	0.175	-				
				50	Le Cheek	-	19100	1900	24	23.42	14.29%	0.356	0.407	-				
					Le Tilt	-	19100	1900	24	23.42	14.29%	0.129	0.147	-				
					Re Cheek	-	19100	1900	24	23.37	15.61%	0.309	0.357	-				
			100		Re Tilt	-	19100	1900	24	23.37	15.61%	0.145	0.168	-				
			100	-	Le Cheek	-	19100	1900	24	23.37	15.61%	0.334	0.386	-				
					Le Tilt	-	19100	1900	24	23.37	15.61%	0.123	0.142	-				
								Front side	15	19100	1900	24.5	24.37	3.04%	0.549	0.566	-	
			1	99	Back side	15	19100	1900	24.5	24.16	8.14%	0.589	0.637	-				
			Į	99	Back side	15	19100	1900	24.5	24.17	7.89%	0.613	0.661	-				
Band2	Body- 20Mhz QPSK —			Back side	15	19100	1900	24.5	24.37	3.04%	0.682	0.703	118					
worn)		50	F0	Front side	15	19100	1900	24	23.42	14.29%	0.455	0.520	-					
		50	50	Back side	15	19100	1900	24	23.42	14.29%	0.549	0.627	-					
			100	100	Front side	15	19100	1900	24	23.37	15.61%	0.440	0.509	-				
		100	100	100	100	100	100	-	Back side	15	19100	1900	24	23.37	15.61%	0.536	0.620	-

Type No.: PM-0851-BV (Dual SIM):

Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance	Measured Avg. Power (dBm)	Scaling		SAR over V/kg) Reported	Plot page
Band2 (Head)	20Mhz	QPSK	1	99	Le Cheek	-	19100	1900	24.5	24.46	0.93%	0.495	0.500	119

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									Max. Rated Avg.	Measured			SAR over 1g /kg)	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
					Front side	10	18700	1860	24.5	24.16	8.14%	0.759	0.821	-
					Front side	10	18900	1880	24.5	24.17	7.89%	0.828	0.893	-
					Front side	10	19100	1900	24.5	24.37	3.04%	0.915	0.943	-
					Back side	10	18700	1860	24.5	24.16	8.14%	1.170	1.265	-
					Back side	10	18900	1880	24.5	24.17	7.89%	1.080	1.165	-
					Back side	10	19100	1900	24.5	24.37	3.04%	1.240	1.278	-
					Back side*	10	19100	1900	24.5	24.37	3.04%	1.260	1.298	120
			1	99	Back side -with headset	10	19100	1900	24.5	24.37	3.04%	0.962	0.991	-
					Bottom side	10	18700	1860	24.5	24.16	8.14%	0.995	1.076	-
					Bottom side	10	18900	1880	24.5	24.17	7.89%	1.070 1.080	1.154	-
					Bottom side	10	19100	1900	24.5	24.37	3.04%		1.113	-
					Right side	10	19100	1900	24.5	24.37	37 3.04% 0.207 C	0.213	-	
			19100	1900	24.5	24.37	3.04%	0.225	0.232	-				
					Front side	10	18700	1860	24	23.17	21.06%	0.207 (0.225 (0.631 (0.685 (0.855 (0.	0.764	-
		Front side 10 19100 1900 24 23.42 14.29%	17.22%	0.685	0.803	-								
			14.29%	0.855	0.977	-								
Band2	20Mhz	QPSK			Back side	10	18700	1860	24	1 23.42 14.29% 0.855 0.977 1 23.17 21.06% 0.897 1.086	1.086	-		
(Hotspot)	ZOWINZ		50	50	Back side	10	18900	1880	24	23.31	17.22%	0.943	1.105	-
					Back side	10	19100	1900	24	23.42	14.29%	1.030	1.177	-
					Bottom side	10	18700	1860	24	23.17	21.06%	0.810	0.981	-
					Bottom side	10	18900	1880	24	23.31	17.22%	0.869	1.019	-
					Bottom side	10	19100	1900	24	23.42	14.29%	0.707	0.808	-
					Right side	10	19100	1900	24	23.42	14.29%	0.190	0.217	-
					Left side	10	19100	1900	24	23.42	14.29%	0.183	0.209	-
					Front side	10	18700	1860	24	23.12	22.46%	0.612	0.749	-
					Front side	10	18900	1880	24	23.14	21.90%	0.668	0.814	-
					Front side	10	19100	1900	24	23.37	15.61%	0.798	0.923	-
					Back side	10	18700	1860	24	23.12	22.46%	0.902	1.105	-
					Back side	10	18900	1880	24	23.14	21.90%	0.927	1.130	-
			100	-	Back side	10	19100	1900	24	23.37	15.61%	1.010	1.168	-
					Bottom side	10	18700	1860	24	23.12	22.46%	0.793	0.971	-
					Bottom side	10	18900	1880	24	23.14	21.90%	0.855	1.042	-
					Bottom side	10	19100	1900	24	23.37	15.61%	0.773	0.894	-
					Right side	10	19100	1900	24	23.37	15.61%	0.188	0.217	-
					Left side	10	19100	1900	24	23.37	15.61%	0.165	0.191	-

^{* -} repeated at the highest SAR measurement according to the FCC KDB 865664 D01v01r03

Type No.: PM-0851-BV (Dual SIM):

	Dec decidale		Modulation RB Size	e RB Offset	Position	Distance (mm)	СН	Freg.	Max. Rated Avg.	Measured			SAR over 1g /kg)	
Mode	Bandwidth (MHz)	Modulation						Freq. (MHz)	Power + Max. Tolerance (dBm)	Avg. Power (dBm)		Measured	Reported	Plot page
Band2 (Hotspot)	20Mhz	QPSK	1	99	Back side*	10	19100	1900	24.5	24.46	0.93%	1.360	1.373	121

^{* -} repeated at the highest SAR measurement according to the FCC KDB 865664 D01v01r03

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LTE FDD Band V

	Bandwidth					5 1.		_	Max. Rated	Measured		3	SAR over V/kg)	51.
Mode	(MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
				49	Re Cheek	-	20600	844	24.5	24.41	2.09%	0.357	0.364	-
				49	Re Tilt	1	20600	844	24.5	24.41	2.09%	0.255	0.260	-
			1	0	Le Cheek	-	20450	829	24.5	24.36	3.28%	0.439	0.453	122
			'		Le Cheek	1	20525	836.5	24.5	24.37	3.04%	0.412	0.425	-
				49	Le Cheek	1	20600	844	24.5	24.41	2.09%	Measured 1.09% 0.357 1.09% 0.255 1.28% 0.439 1.04% 0.412 1.09% 0.256 1.94% 0.295 1.94% 0.202 1.94% 0.202 1.94% 0.205 1.94% 0.291 1.94% 0.191 1.94% 0.191 1.94% 0.195 1.94% 0.330 1.28% 0.374 1.04% 0.407 1.09% 0.415	0.430	-
					Le Tilt	-	20600	844	24.5	24.41	2.09%		0.261	-
Band5	10Mhz	QPSK			Re Cheek	-	20600	844	24	23.51	2.09% 0.255 0.266 3.28% 0.439 0.45; 3.04% 0.412 0.42; 2.09% 0.421 0.43; 2.09% 0.256 0.26; 11.94% 0.295 0.33; 11.94% 0.202 0.22; 11.94% 0.205 0.22; 11.94% 0.291 0.32; 11.94% 0.191 0.21; 11.94% 0.195 0.218; 2.09% 0.330 0.33; 3.28% 0.374 0.38;	0.295	0.330	-
(Head)	TOWITE	UPSK	25	25	Re Tilt	-	20600	844	24	23.51		0.226	-	
			25	25	Le Cheek	-	20600	20600 844 24 23.51 11.94% 0.34	0.342	0.383	-			
					Le Tilt	-	20600	844	24	23.51	11.94%	0.256 0.261 0.295 0.330 0.202 0.226 0.342 0.383 0.205 0.229 0.291 0.326 0.191 0.214 0.347 0.388	0.229	-
			Fig. 1. Fig. 1		Re Cheek	-	20450	829	24	23.51	11.94%		0.326	-
				11.94%	0.191	0.214	-							
				-	Le Cheek	-	20450	829	24	23.51	11.94%	0.347	0.388	-
					Le Tilt	-	20450	829	24	23.51	11.94%	0.195	0.218	-
					Front side	15	20600	844	24.5	24.41	2.09%	0.330	0.337	-
			1	49	Back side	15	20450	829	24.5	24.36	3.28%	0.374	0.386	-
			'	49	Back side	15	20525	836.5	24.5	24.37	3.04%	0.407	0.419	-
Band5	20146-	QPSK			Back side	15	20600	844	24.5	24.41	2.09%	0.415	0.424	123
(Body- worn)	20Mhz	UPSK	25	25	Front side	15	20600	844	24	23.51	11.94%	0.262	0.293	-
			25	25	Back side	15	20600	844	24	23.51	11.94%	0.292	0.327	-
			50	F0.	Front side	15	20450	829	24	23.51	11.94%	0.219	0.245	-
			50	-	Back side	15	20450	829	24	23.51	11.94%	0.238	0.266	-

Type No.: PM-0851-BV (Dual SIM):

								Max. Rated			Measured		Averaged SAR over 1g (W/kg)		
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page	
Band5 (Head)	10Mhz	QPSK	1	0	Le Cheek	-	20450	829	24.5	24.41	2.09%	0.460	0.470	124	

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									Max. Rated	Measured			SAR over V/kg)	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
					Front side	10mm	20600	844	24.5	24.41	2.09%	0.374	0.382	-
				49	Back side	10mm	20450	829	24.5	24.36	3.28%	0.470	0.485	-
				49	Back side	10mm	20525	836.5	24.5	24.37	3.04%	0.523	0.539	-
			1		Back side	10mm	20600	844	24.5	24.41	2.09% 0.534 0.545	0.545	125	
					Bottom side	10mm	20600	844	24.5	24.41	2.09%	0.203	0.207	-
				49	Right side	10mm	20600	844	24.5	24.41	2.09%	0.270	0.276	-
					Left side	10mm	20600	844	24.5	24.41	2.09%	Measured Rep 0.374 0. 0.470 0. 0.523 0. 0.534 0. 0.203 0. 0.270 0. 0.508 0. 0.302 0. 0.455 0. 0.445 0. 0.210 0. 0.409 0. 0.301 0. 0.427 0. 0.162 0.	0.519	-
Band5					Front side	10mm	20450	844	24	23.51	11.94% 0.302	0.302	0.338	-
(Hotspot)	10Mhz	QPSK	25	25	Back side	10mm	20600	844	24	23.51	11.94%	0.455	0.509	-
					Bottom side	10mm	20600	844	24	23.51	11.94%	0.143	0.160	-
					Right side	10mm	20450	844	24	23.51	11.94%	0.203 0. 0.270 0. 0.508 0. 0.302 0. 0.455 0. 0.143 0. 0.210 0. 0.409 0. 0.301 0.	0.235	-
					Left side	10mm	20450	844	24	23.51	11.94%		0.458	-
					Front side	10mm	20450	829	24	23.51	11.94%		0.337	-
					Back side	10mm	20450	829	24	23.51	11.94%	0.427	0.478	-
			50	-	Bottom side	10mm	20450	829	24	23.51	11.94%	0.162	0.181	-
					Right side	10mm	20450	844	24	23.51	11.94%	0.149	0.167	-
					Left side	10mm	20450	829	24	23.51	11.94%	0.350	0.392	-

Type No.: PM-0851-BV (Dual SIM):

								114.04	Rated	Rated	Measured	leasured	Averaged 1g (V	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
Band5 (Hotspot)	10Mhz	QPSK	1	49	Back side	10mm	20600	844	24.5	24.41	2.09%	0.575	0.587	126

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LTE FDD Band VII

	Randwidth					Distance		Freq.	Max. Rated Avg.	Measured Avg.			SAR over V/kg)	Plot
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	(mm)	СН	(MHz)	Power + Max. Tolerance	Power (dBm)	Scaling	Measured	Reported	page
					Re Cheek	-	20850	2510	22.3	22.17	3.04%	0.168	0.173	-
					Re Cheek	-	21100	2535	22.3	22.24	1.39%	0.210	0.213	-
			1	99	Re Cheek	-	21350	2560	22.3	22.26	0.93%	0.247	0.249	127
			'	99	Re Tilt	-	21350	2560	22.3	22.26	0.93%	0.038	0.038	-
					Le Cheek	-	21350	2560	22.3	22.26	0.93%	0.209	0.211	-
	Band7 20Mhz				Le Tilt	-	21350	2560	22.3	22.26	0.93%	0.055	0.056	-
Band7		QPSK			Re Cheek	-	21350	2560	22	21.37	15.61%	0.190	0.220	-
(Head)	ZUIVINZ	QPSK	Ε0	Ε0	Re Tilt	-	21350	2560	22	21.37	15.61%	0.047	0.054	-
			50	50	Le Cheek	-	21350	2560	22	21.37	15.61%	0.140	0.162	-
					Le Tilt	-	21350	2560	22	21.37	15.61%	0.044	0.051	-
					Re Cheek	-	21350	2560	22	21.3	17.49%	0.183	0.215	-
			100		Re Tilt	-	21350	2560	22	21.3	17.49%	0.046	0.054	-
			100	-	Le Cheek	-	21350	2560	22	21.3	17.49%	0.136	0.160	-
					Le Tilt	-	21350	2560	22	21.3	17.49%	0.042	0.049	-
					Front side	15	21350	2560	22.3	22.26	0.93%	0.413	0.417	-
			1	99	Back side	15	20850	2510	22.3	22.17	3.04%	0.734	0.756	-
			'	99	Back side	15	21100	2535	22.3	22.24	1.39%	0.803	0.814	128
Band7	2014-	ODCK			Back side	15	21350	2560	22.3	22.26	0.93%	0.748	0.755	-
(Body- worn)	20Mhz	QPSK	Ε0.	F0	Front side	15	21350	2560	22	21.37	15.61%	0.309	0.357	-
			50	50	Back side	15	21350	2560	22	21.37	15.61%	0.596	0.689	-
			100		Front side	15	21350	2560	22	21.3	17.49%	0.294	0.345	-
			100	-	Back side	15	21350	2560	22	21.3	17.49%	0.594	0.698	-

Type No.: PM-0851-BV (Dual SIM):

Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance	Measured Avg. Power (dBm)	Scaling	_	SAR over V/kg) Reported	Plot page
Band7 (Head)	20Mhz	QPSK	1	99	Re Cheek	-	21350	2560	22.9	22.9	0.00%	0.239	0.239	129

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									Max. Rated	Measured		Averaged 1g (V	SAR over V/kg)	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Avg. Power + Max. Tolerance	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
					Front side	10	21350	2560	22.3	22.26	0.93%	0.56	0.57	-
					Back side	10	20850	2510	22.3	22.17	3.04%	1.04	1.07	-
					Back side	10	21100	2535	22.3	22.24	1.39%	1.10	1.12	-
					Back side	10	21350	2560	22.3	22.26	0.93%	1.16	1.17	130
			1	99	Back side*	10	21350	2560	22.3	22.26	0.93%	1.11	1.12	-
			'	//	Bottom side	10	20850	2510	22.3	22.17	3.04%	0.94	0.97	-
				Bottom side	10	21100	2535	22.3	22.24	1.39%	1.05	1.06	-	
				Bottom side	10	21350	2560	22.3	22.26	0.93%	1.10	1.11	-	
					Right side	10	21350	2560	22.3	22.26	0.93%	0.11	0.11	-
					Left side	10	21350	2560	22.3	22.26	0.93%	0.10	0.10	-
					Front side	10	21350	2560	22	21.37	15.61%	0.46	0.53	-
					Back side	10	20850	2510	22	21.25	18.85%	0.84	1.00	-
					Back side	10	21100	2535	22	21.32	16.95%	0.91	1.06	-
Band7	20Mhz	QPSK			Back side	10	21350	2560	22	21.37	15.61%	0.94	1.09	-
(Hotspot)	ZOIVITIZ	QI JIK	50	50	Bottom side	10	20850	2510	22	21.25	18.85%	0.75	0.90	-
					Bottom side	10	21100	2535	22	21.32	16.95%	0.83	0.97	-
					Bottom side	10	21350	2560	22	21.37	15.61%	0.87	1.01	-
					Right side	10	21350	2560	22	21.37	15.61%	0.08	0.10	-
					Left side	10	21350	2560	22	21.37	15.61%	0.08	0.09	-
					Front side	10	21350	2560	22	21.3	17.49%	0.42	0.50	-
					Back side	10	20850	2510	22	21.15	21.62%	0.83	1.01	-
					Back side	10	21100	2535	22	21.2	20.23%	0.90	1.08	-
					Back side	10	21350	2560	22	21.3	17.49%	0.93	1.09	-
			100	-	Bottom side	10	20850	2510	22	21.15	21.62%	0.75	0.92	-
					Bottom side	10	21100	2535	22	21.2	20.23%	0.81	0.98	-
					Bottom side	10	21350	2560	22	21.3	17.49%	0.87	1.02	-
					Right side	10	21350	2560	22	21.3	17.49%	0.08	0.10	-
					Left side	10	21350	2560	22	21.3	17.49%	0.08	0.09	-]

^{* -} repeated at the highest SAR measurement according to the FCC KDB 865664 D01v01r03

Type No.: PM-0851-BV (Dual SIM):

	Do nahadabb					Distance		F	Max. Rated Avg.	Measured		_	SAR over 1g /kg)	
Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
Band7 (Hotspot)	20Mhz	QPSK	1	99	Back side	10	21350	2560	22.3	22.29	0.23%	1.110	1.113	131

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WLAN802.11 b

					Max. Rated Avg.				AR over 1g /kg)	
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	RE Cheek	-	1	2412	16.00	15.71	6.91%	0.372	0.398	-
	RE Cheek	-	6	2437	16.00	15.91	2.09%	0.514	0.525	132
802.11 b	RE Cheek	-	11	2462	16.00	15.98	0.46%	0.430	0.432	-
(Head)	RE Tilt	-	11	2462	16.00	15.98	0.46%	0.297	0.298	-
	LE Cheek	-	11	2462	16.00	15.98	0.46%	0.243	0.244	-
	LE Tilt	-	11	2462	16.00	15.98	0.46%	0.171	0.172	-
	Front side	10mm	11	2462	16.00	15.98	0.46%	0.188	0.189	-
	Back side	10mm	1	2412	16.00	15.71	6.91%	0.331	0.354	-
802.11 b	Back side	10mm	6	2437	16.00	15.91	2.09%	0.441	0.450	-
(Hotspot)	Back side	10mm	11	2462	16.00	15.98	0.46%	0.546	0.549	133
	Top side	10mm	11	2462	16.00	15.98	0.46%	0.076	0.076	-
	Left side	10mm	11	2462	16.00	15.98	0.46%	0.242	0.243	-

Type No.: PM-0851-BV (Dual SIM):

31					Max. Rated Avg.			Averaged S (W/	0	
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
802.11 b (Head)	RE Cheek	-	6	2437	16.00	15.87	3.04%	0.419	0.432	134
802.11 b (Hotspot)	Back side	10mm	11	2462	16.00	15.92	1.86%	0.574	0.585	135

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WLAN802.11 a 5.2G

					Max. Rated Avg.				AR over 1g /kg)	
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	RE Cheek	-	48	5240	14.00	13.77	5.44%	0.196	0.207	-
802.11 a	RE Tilt	-	36	5180	14.00	13.76	5.68%	0.190	0.201	-
5.2G	RE Tilt	-	48	5240	14.00	13.77	5.44%	0.204	0.215	136
(Head)	LE Cheek	-	48	5240	14.00	13.77	5.44%	0.160	0.169	-
	LE Tilt	-	48	5240	14.00	13.77	5.44%	0.176	0.186	-
802.11 a	Front side	15mm	48	5240	14.00	13.77	5.44%	0.039	0.041	-
5.2G (Body-	Back side	15mm	36	5180	14.00	13.76	5.68%	0.253	0.267	-
worn)	Back side	15mm	48	5240	14.00	13.77	5.44%	0.265	0.279	137

WLAN802.11 a 5.3G

					Max. Rated Avg.			Averaged S (W)		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	RE Cheek	-	56	5280	14.00	13.89	2.57%	0.192	0.197	-
802.11 a	RE Cheek	-	64	5320	14.00	13.99	0.23%	0.218	0.219	138
5.3G	RE Tilt	-	64	5320	14.00	13.99	0.23%	0.208	0.208	-
(Head)	LE Cheek	-	64	5320	14.00	13.99	0.23%	0.155	0.155	-
	LE Tilt	-	64	5320	14.00	13.99	0.23%	0.190	0.190	-
802.11 a	Front side	15mm	64	5320	14.00	13.99	0.23%	0.053	0.053	-
5.3G (Body-	Back side	15mm	56	5280	14.00	13.89	2.57%	0.266	0.273	-
worn)	Back side	15mm	64	5320	14.00	13.99	0.23%	0.270	0.271	139

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WLAN802.11 a 5.6G

					Max. Rated Avg.				AR over 1g /kg)	
Mode	Posit ion	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	RE Cheek	-	108	5540	14.00	13.72	6.66%	0.310	0.331	-
	RE Cheek	-	132	5660	14.00	13.99	0.23%	0.410	0.411	140
802.11 a	RE Cheek	-	136	5680	14.00	13.97	0.69%	0.392	0.395	-
5.6G (Head)	RE Tilt	-	132	5660	14.00	13.99	0.23%	0.403	0.404	-
	LE Cheek	-	132	5660	14.00	13.99	0.23%	0.222	0.223	-
	LE Tilt	-	132	5660	14.00	13.99	0.23%	0.266	0.267	-
802.11 a	Front side	15mm	132	5660	14.00	13.99	0.23%	0.037	0.037	-
5.6G	Back side	15mm	108	5540	14.00	13.72	6.66%	0.305	0.325	-
(Body-	Back side	15mm	132	5660	14.00	13.99	0.23%	0.388	0.389	141
worn)	Back side	15mm	136	5680	14.00	13.97	0.69%	0.373	0.376	-

Type No.: PM-0851-BV (Dual SIM):

					Max. Rated Avg.				AR over 1g 'kg)	
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
802.11 a 5.6G (Body-	Back side	15mm	132	5660	14.00	13.87	3.04%	0.361	0.372	142

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WLAN802.11 a 5.8G

					Max. Rated Avg.			Averaged S (W/		
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
	RE Cheek	-	153	5765	14.00	13.78	5.20%	0.423	0.445	-
	RE Cheek	-	157	5785	14.00	13.77	5.44%	0.491	0.518	143
802.11 a 5.8G	RE Cheek	-	161	5805	14.00	13.88	2.80%	0.490	0.504	-
(Head)	RE Tilt	-	161	5805	14.00	13.88	2.80%	0.455	0.468	-
	LE Cheek	-	161	5805	14.00	13.88	2.80%	0.283	0.291	-
	LE Tilt	-	161	5805	14.00	13.88	2.80%	0.314	0.323	-
802.11 a	Front side	15mm	161	5805	14.00	13.88	2.80%	0.083	0.085	-
5.8G	Back side	15mm	153	5765	14.00	13.78	5.20%	0.342	0.360	-
(Body-	Back side	15mm	157	5785	14.00	13.77	5.44%	0.344	0.363	-
worn)	Back side	15mm	161	5805	14.00	13.88	2.80%	0.346	0.356	144

Type No.: PM-0851-BV (Dual SIM):

					Max. Rated Avg.			Averaged S (W/	AR over 1g 'kg)	
Mode	Position	Distance (mm)	СН	Freq. (MHz)	Power +	Measured Avg. Power (dBm)	Scaling	Measured	Reported	Plot page
802.11 a 5.8G (Head)	RE Cheek	-	157	5785	14.00	13.87	3.04%	0.401	0.413	145

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3. Simultaneous Tramsmission Analysis

Simultaneous Tramsmission 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/B5 + 2.4GHz Wi-Fi	Yes	No	Yes
LTE FDD B2/B5/B7 + 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/B5 + 5GHz Wi-Fi	Yes	Yes	No
LTE FDD B2/B5/B7 + 5GHz Wi-Fi	Yes	Yes	No
GSM850/1900 + Bluetooth	No	Yes	No
GPRS850/1900 + Bluetooth	No	No	Yes
UMTS B2/B5 + Bluetooth	No	Yes	Yes
LTE FDD B2/B5/B7 + Bluetooth	No	Yes	Yes

Notes:

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

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

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-1q.

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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 ≤ 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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Simultaneous Transmission Combination

	r	eported SAR WV			z, ΣSAR evalu	ation	
Frequency	P	osition		AR / W/kg	ΣSAR	Calculated	SPLSR
band			WWAN	WLAN	<1.6W/kg	distance (mm)	(≤0.04)
		Right cheek	0.42	0.52	0.940	-	-
GSM 850	Head	Right tilt	0.22	0.30	0.517	-	-
G3W 636	rieau	Left cheek	0.50	0.24	0.747	-	-
		Left tilt	0.23	0.17	0.396	ı	-
		Front	0.51	0.19	0.702	-	-
		Back	0.69	0.58	1.270	-	-
GPRS 850	Hotopot	Тор	-	0.08	-	-	-
(1Dn1UP)	Hotspot	Bottom	0.21	-	-	-	-
		Right	0.22	-	-	-	-
		Left	0.46	0.24	0.705	-	-
		Right cheek	0.19	0.52	0.707	-	-
GSM 1900	Head	Right tilt	0.07	0.30	0.369	-	-
GSIVI 1900	пеац	Left cheek	0.17	0.24	0.413	-	-
		Left tilt	0.07	0.17	0.240	-	-
		Front	0.43	0.19	0.620	-	-
		Back	0.60	0.58	1.180	-	-
GPRS 1900	Hatamat	Тор	-	0.08	-	-	-
(1Dn1UP)	Hotspot	Bottom	0.63	-	-	-	-
		Right	0.12	-	-	-	-
		Left	0.11	0.24	0.349	-	-

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	rep	orted SAR WW	AN and WLA	N DTS 2.4GH	Iz. ΣSAR eval	uation	
Frequency				AR / W/kg	ΣSAR	Calculated	SPLSR
band	P	osition	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		Right cheek	0.24	0.52	0.757	-	-
	Lload	Right tilt	0.11	0.30	0.407	-	-
	Head	Left cheek	0.46	0.24	0.703	-	-
		Left tilt	0.12	0.17	0.289	-	-
WCDMA		Front	0.74	0.19	0.933	-	-
Band II		Back	1.06	0.58	1.642	118	0.018
	Hotspot	Тор	-	0.08	-	-	-
		Bottom	1.24	-	-	-	-
		Right	0.21	-	-	-	-
		Left	0.19	0.24	0.428	-	-
		Right cheek	0.36	0.52	0.880	-	-
	Lload	Right tilt	0.21	0.30	0.505	-	-
	Head	Left cheek	0.46	0.24	0.703	-	-
		Left tilt	0.22	0.17	0.391	-	-
WCDMA		Front	0.53	0.19	0.718	-	-
Band V		Back	0.79	0.58	1.368	-	-
	Hotonst	Тор	-	0.08	-	-	-
	Hotspot	Bottom	0.74	-	-	-	-
		Right	0.23	-	-	-	-
		Left	0.47	0.24	0.708	-	-

			C	oordinates (cn	<u>n)</u>		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	1.06	0.55	6.29	-0.07	1.64	118	0.018	SPLSR<0.04,
802.11b CH 11	back side	0.58	-3.14	-4.92	-0.09	1.04	110	0.018	Not required
-			WLAN	l b			WCD	MA B2	

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	repo	rted SAR WW	AN and WLA	N DTS 2.4G	Hz, Σ SAR ev	aluation	
Frequency		osition	reported S	SAR / W/kg	ΣSAR	Calculated	SPLSR
band			WWAN	WLAN	<1.6W/kg	distance (mm)	(≤0.04)
		Right cheek	0.42	0.52	0.940	-	-
	Head	Right tilt	0.20	0.30	0.497	-	-
		Left cheek	0.50	0.24	0.743	-	-
		Left tilt	0.16	0.17	0.331	-	-
LTE FDD		Front	0.98	0.19	1.170	-	-
Band 2		Back	1.36	0.58	1.940	111.7	0.024
	Hotspot	Тор	-	0.08	-	-	-
	Ποισμοί	Bottom	1.15	-	-	-	-
		Right	0.22	-	-	ı	-
		Left	0.23	0.24	0.472	-	-
		Right cheek	0.36	0.52	0.880	-	-
	Llaad	Right tilt	0.26	0.30	0.557	-	-
	Head	Left cheek	0.47	0.24	0.713	-	-
		Left tilt	0.26	0.17	0.431	-	-
LTE FDD		Front	0.38	0.19	0.570	-	-
Band 5		Back	0.59	0.58	1.170	-	-
		Тор	-	0.08	-	-	-
	Hotspot	Bottom	0.21	-	-	-	-
		Right	0.28	-	-	-	-
		Left	0.52	0.24	0.762	-	-
		Right cheek	0.25	0.52	0.770	-	-
	11	Right tilt	0.05	0.30	0.347	-	-
	Head	Left cheek	0.21	0.24	0.453	-	-
		Left tilt	0.06	0.17	0.231	-	-
LTE FDD		Front	0.57	0.19	0.760	-	-
Band 7		Back	1.17	0.58	1.750	109	0.021
		Тор	-	0.08	-	-	-
	Hotspot	Bottom	1.11	-	-	-	-
		Right	0.11	-	-	-	-
		Left	0.10	0.24	0.342	-	-

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			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 2 CH 19100	Back side	1.36	0.77	5.54	-0.03	1.94	111.7	0.024	SPLSR<0.04,
802.11b CH 11	Dack side	0.58	-3.14	-4.92	-0.09	1.74	111.7	0.024	Not required
			TE and 2	1	W	/LAN b			

Conditions	Position	SAR Value (W/kg)	х	oordinates (cr	n) Z	ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
LTE Band 7 CH 21350	Back side	1.17	-0.5	6.1	-0.02	1.75	109	0.021	SPLSR<0.04,
802.11b CH 11	Dack Side	0.58	-3.28	-4.44	-0.09	1.75	107	0.021	Not required
7			TE nd 7			WLAN	N b		

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	reporte	d SAR WWA	N and WLAI	N DTS 5.8 G	Hz, ΣSAR e	valuation	
Frequency	-		reported S	AR / W/kg	ΣSAR	Calculated	SPLSR
band	Ро	sition	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
	Head	RE cheek	0.42	0.52	0.94	-	-
		RE tilt	0.22	0.47	0.69	-	-
GSM 850	Heau	LE cheek	0.50	0.29	0.794	-	-
G3W 650		LE tilt	0.23	0.32	0.545	-	-
	Body-	Front	0.26	0.09	0.35	-	-
Worn	Worn	Back	0.35	0.36	0.71	-	-
		RE cheek	0.21	0.52	0.725	-	-
	Head	RE tilt	0.07	0.47	0.542	-	-
GSM 1900	Heau	LE cheek	0.17	0.29	0.46	-	-
G3W 1900		LE tilt	0.07	0.32	0.389	-	-
	Body- Worn	Front	0.42	0.09	0.51	-	-
		Back	0.62	0.36	0.98	-	-
		RE cheek	0.24	0.52	0.757	-	-
	Head	RE tilt	0.11	0.47	0.58	-	-
WCDMA	Heau	LE cheek	0.46	0.29	0.75	-	-
Band II		LE tilt	0.12	0.32	0.438	-	-
	Body-	Front	0.42	0.09	0.51	-	-
	Worn	Back	0.62	0.36	0.98	-	-
		RE cheek	0.36	0.52	0.88	-	-
	Head	RE tilt	0.21	0.47	0.678	-	-
WCDMA	пеаи	LE cheek	0.45	0.29	0.741	-	-
Band V		LE tilt	0.22	0.32	0.54	-	-
	Body-	Front	0.20	0.09	0.29	-	-
	Worn	Back	0.32	0.36	0.68	-	-

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		-1 CAD \A\\A\A	DII \0/1 01	N DTC F O C	NIL FCAD		
	reporte	d SAR WWA				Valuation Calculated	
Frequency band	Position		www.	SAR / W/kg WLAN	ΣSAR <1.6W/kg	distance (mm)	SPLSR (≦0.04)
		RE cheek	0.42	0.52	0.94	-	-
	11	RE tilt	0.20	0.47	0.67	-	-
LTE FDD	Head	LE cheek	0.50	0.29	0.79	-	-
Band 2		LE tilt	0.16	0.32	0.48	-	-
	Body-	Front	0.57	0.09	0.66	-	-
	Worn	Back	0.7	0.36	1.06	-	-
	Head	RE cheek	0.36	0.52	0.88	-	-
		RE tilt	0.26	0.47	0.73	-	-
LTE FDD		LE cheek	0.47	0.29	0.76	-	-
Band 5		LE tilt	0.26	0.32	0.58	-	-
	Body-	Front	0.34	0.09	0.43	-	ı
	Worn	Back	0.42	0.36	0.78	-	ı
		RE cheek	0.25	0.52	0.77	-	ı
	Head	RE tilt	0.05	0.47	0.52	-	ı
LTE FDD	rieau	LE cheek	0.21	0.29	0.5	-	-
Band 7		LE tilt	0.06	0.32	0.38	-	-
	Body-	Front	0.42	0.09	0.51	-	-
	Worn	Back	0.81	0.36	1.17	-	-

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	reporte	d SAR WW	AN and WL	AN UNII 5 GH	Iz, ΣSAR eva	luation	
Frequency			reported	SAR / W/kg	ΣSAR	Calculated	SPLSR
band	Posi	tion	WWAN	WLAN	<1.6W/kg	distance (mm)	(≦0.04)
		RE cheek	0.42	0.41	0.83	-	-
	Head	RE tilt	0.22	0.4	0.62	-	-
GSM 850	rieau	LE cheek	0.50	0.22	0.724	-	-
G3W 650		LE tilt	0.23	0.27	0.495	-	-
	Body-Worn	Front	0.26	0.05	0.31	-	-
	Body-Worli	Back	0.35	0.39	0.74	-	-
		RE cheek	0.19	0.41	0.597	-	-
	Head	RE tilt	0.07	0.4	0.472	-	-
GSM 1900	пеац	LE cheek	0.16	0.22	0.383	-	-
G3W 1900		LE tilt	0.07	0.27	0.339	-	-
	Body-Worn	Front	0.23	0.05	0.28	-	-
		Back	0.32	0.39	0.71	-	-
		RE cheek	0.24	0.41	0.647	-	-
	Head	RE tilt	0.11	0.4	0.51	-	-
WCDMA	rieau	LE cheek	0.28	0.22	0.502	-	-
Band II		LE tilt	0.12	0.27	0.388	-	-
	Body-Worn	Front	0.42	0.05	0.47	-	-
	Body-Worn	Back	0.62	0.39	1.01	-	-
		RE cheek	0.36	0.41	0.77	-	-
	Head	RE tilt	0.21	0.4	0.608	-	-
WCDMA	пеаи	LE cheek	0.45	0.22	0.671	-	-
Band V		LE tilt	0.22	0.27	0.49	-	-
	Body-Worn	Front	0.20	0.05	0.25	-	-
	Body-worn	Back	0.32	0.39	0.71	-	-

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	reported SAR WWAN and WLAN UNIT 5 GHz, ΣSAR evaluation											
Frequency			reported	SAR / W/kg	ΣSAR	Calculated	SPLSR					
band	Posi	Position		WLAN	<1.6W/kg	distance (mm)	(≦0.04)					
		RE cheek	0.42	0.41	0.83	-	-					
	Head	RE tilt	0.20	0.4	0.6	-	-					
LTE FDD	пеац	LE cheek	0.50	0.22	0.72	-	-					
Band2		LE tilt	0.16	0.27	0.43	-	-					
	Pody Worn	Front	0.57	0.05	0.62	-	-					
	Body-Worn	Back	0.7	0.39	1.09	-	-					
	Head	RE cheek	0.36	0.41	0.77	-	-					
		RE tilt	0.26	0.4	0.66	-	-					
LTE FDD		LE cheek	0.47	0.22	0.69	-	-					
Band5		LE tilt	0.26	0.27	0.53	-	-					
	Body-Worn	Front	0.34	0.05	0.39	-	-					
	Body-Worn	Back	0.42	0.39	0.81	-	-					
		RE cheek	0.25	0.41	0.66	-	-					
	Head	RE tilt	0.05	0.4	0.45	-	-					
LTE FDD	пеац	LE cheek	0.21	0.22	0.43	-	-					
Band7		LE tilt	0.06	0.27	0.33	-	-					
	Body-Worn	Front	0.42	0.05	0.47	_	-					
	Body-World	Back	0.81	0.39	1.2	-	-					

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	repo	orted SAR W	WAN and I	Bluetooth, 2	SAR evalua	ition	
Frequency				SAR / W/kg	ΣSAR	Calculated	SPLSR
band	Posi	tion	WWAN	Bluetooth	<1.6W/kg	distance (mm)	(≦0.04)
GSM 850	Body-Worn	Front	0.26	0.048	0.308	-	-
G3W 650	Body-Worli	Back	0.35	0.048	0.398	-	-
		Front	0.51	0.072	0.584	-	-
		Back	0.69	0.072	0.762	-	-
GPRS 850	Hotspot	Тор	-	0.072	-	-	1
(1Dn1UP)	Hotspot	Bottom	0.21	-	-	-	-
		Right	0.22	-	-	-	-
		Left	0.46	0.072	0.535	-	-
GSM 1900	Body-Worn	Front	0.42	0.048	0.468	-	-
G3W 1900	Body-World	Back	0.62	0.048	0.668	-	-
		Front	0.43	0.072	0.502	-	-
		Back	0.60	0.072	0.672	-	-
GPRS 1900	Hotspot	Тор	-	0.072	-	-	-
(1Dn1UP)		Bottom	0.63	-	-	-	-
		Right	0.12	-	-	-	-
		Left	0.11	0.072	0.179	-	-
	Body-Worn	Front	0.42	0.048	0.468	-	-
		Back	0.62	0.048	0.668	-	-
		Front	0.74	0.072	0.815	-	-
WCDMA		Back	1.04	0.072	1.112	-	-
Band II	Hatamat	Тор	-	0.072	-	-	-
	Hotspot	Bottom	1.12	-	-	-	-
		Right	0.21	-	-	-	-
		Left	0.19	0.072	0.258	-	-
	Body Mari	Front	0.20	0.048	0.248	-	-
	Body-Worn	Back	0.32	0.048	0.368	-	-
		Front	0.53	0.072	0.6	-	-
WCDMA		Back	0.79	0.072	0.86	-	-
Band V		Тор	-	0.072	-	-	-
	Hotspot	Bottom	0.19	-	-	-	-
		Right	0.23	-	-	-	-
		Left	0.47	0.072	0.538	-	-

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reported SAR WWAN and Bluetooth, ΣSAR evaluation										
Frequency band	Position		reported SAR / W/kg		ΣSAR	Calculated	SPLSR			
			WWAN	Bluetooth	<1.6W/kg	distance (mm)	(≦0.04)			
LTE FDD Band2	Body-Worn	Front	0.57	0.048	0.618	-	ı			
		Back	0.7	0.048	0.748	-	-			
	Hotspot	Front	0.98	0.072	1.052	-	ı			
		Back	1.36	0.072	1.432	-	1			
		Тор	-	0.072	-	-	ı			
		Bottom	1.15	-	-	-	-			
		Right	0.22	-	-	-	-			
		Left	0.23	0.072	0.302	-	-			
LTE FDD Band5	Body-Worn	Front	0.34	0.048	0.388	-	1			
		Back	0.42	0.048	0.468	-	-			
	Hotspot	Front	0.38	0.072	0.452	-	1			
		Back	0.59	0.072	0.662	-	-			
		Тор	-	0.072	-	-	ı			
		Bottom	0.21	-	-	-	1			
		Right	0.28	-	-	-	1			
		Left	0.52	0.072	0.592	-	-			
LTE FDD Band7	Body-Worn	Front	0.42	0.048	0.468	-	1			
		Back	0.81	0.048	0.858	-	-			
	Hotspot	Front	0.57	0.072	0.642	-	1			
		Back	1.17	0.072	1.242	-	-			
		Тор	-	0.072	-	-	•			
		Bottom	1.11	-	-	-	-			
		Right	0.11	-	-	-	1			
		Left	0.10	0.072	0.172	-	-			

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4. Instruments List

Device	Manufacturer	Typo	Serial	Date of last	Date of next
Device	Manufacturei	Туре	number	calibration	calibration
		EX3DV4	3923	Aug.28,2014	Aug.27,2015
Dosimetric E-Field Probe	Schmid & Partner		3831	Jan.31,2014	Jan.30,2015
Frobe	Engineering AG		3770	Apr.24,2014	Apr.23,2015
		D835V2	4d063	Aug.28,2014	Aug.27,2015
Cyatam Validation	Colomid O Dortmor	D1900V2	5d027	Apr.23,2014	Apr.22,2015
System Validation Dipole	Schmid & Partner Engineering AG	D2450V2	727	Apr.23,2014	Apr.22,2015
Dipole	Linginicering Ad	D2600V2	1005	Jan.28,2014	Jan.27,2015
		D5GHzV2	1104	Apr.16,2014	Apr.15,2015
		DAE4	1260	Aug.26,2014	Aug.25,2015
Data acquisition Electronics	Schmid & Partner Engineering AG		915	Jun.18,2014	Jun.17,2015
			856	Aug.27,2014	Aug.26,2015
Software	Schmid & Partner Engineering AG	DASY 52 V52.8.8	N/A	Calibration not required	Calibration not required
Phantom	Schmid & Partner Engineering AG	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	Agilent	E5071C	MY46108212	Aug.28,2014	Aug.27,2015
Dielectric Probe Kit	Agilopt	85070E	MY44300677	Calibration not	Calibration
Dielectric Probe Kit	Agilent			required	not required
Dual-directional	Agilent	772D	MY46151242	Jul.14,2014	Jul.13,2015
coupler	Agiletit	778D	MY48220468	Apr.01,2014	Mar.31,2015
RF Signal Generator	Agilent	N5181A	MY50141235	Dec.14,2013	Dec.13,2016
Power Meter	Agilent	E4417A	MY51410006	Oct.25,2013	Oct.24,2015
Power Sensor	Agilent	E9301H	MY51470001	Dec.16,2013	Dec.15,2015
Radio Communication Test	R&S	CMU200	113505	Aug.14,2014	Aug.13,2015
Radio Communication Test	Anritsu	MT8820C	6200930984	Aug.28,2014	Aug.27,2015
TECPEL	Digital thermometer	DTM-303A	TP130074	Mar.20,2014	Mar.19,2015

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5. Measurements

Date: 2014/11/13

GSM 850_Head_Le Cheek_CH 251

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

Medium parameters used: f = 849 MHz; $\sigma = 0.896$ S/m; $\varepsilon_r = 40.97$; $\rho = 1000$ kg/m³

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) = 0.589 W/kg

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

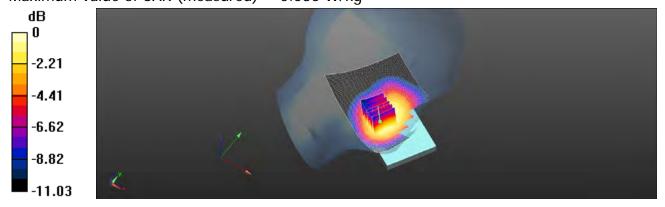
dy=8mm, dz=5mm

Reference Value = 5.944 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.654 W/kg

SAR(1 g) = 0.504 W/kg; SAR(10 g) = 0.367 W/kg

Maximum value of SAR (measured) = 0.586 W/kg



0 dB = 0.586 W/kq = -2.32 dBW/kq

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Date: 2014/11/15

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; $\varepsilon_r = 52.754$; $\rho = 1000$ kg/m³

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) = 0.456 W/kg

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

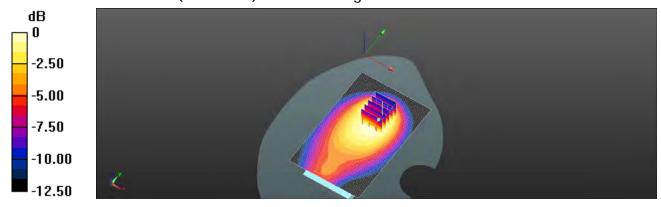
dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.97 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.540 W/kg

SAR(1 g) = 0.353 W/kg; SAR(10 g) = 0.242 W/kg

Maximum value of SAR (measured) = 0.445 W/kg



0 dB = 0.445 W/kg = -3.52 dBW/kg

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GPRS 850_Hotspot mode_Back side_CH 251_10mm

Communication System: GPRS (1Dn1Up); Frequency: 848.8 MHz, Duty factor: 1:8.3 Medium parameters used: f = 849 MHz; $\sigma = 1.027$ S/m; $\varepsilon_r = 52.754$; $\rho = 1000$ kg/m³

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) = 0.815 W/kg

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

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

Reference Value = 25.94 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.910 W/kg

SAR(1 g) = 0.690 W/kg; SAR(10 g) = 0.503 W/kg

Maximum value of SAR (measured) = 0.814 W/kg Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

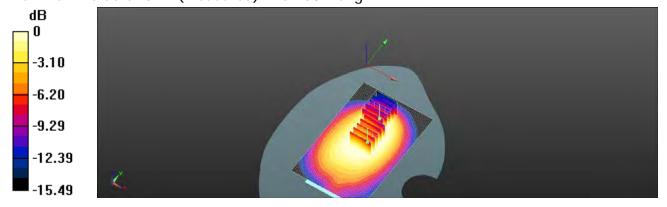
dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.94 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.871 W/kg

SAR(1 g) = 0.548 W/kg; SAR(10 g) = 0.358 W/kg

Maximum value of SAR (measured) = 0.708 W/kg



0 dB = 0.708 W/kg = -1.50 dBW/kg

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GSM 850_Head_Le Cheek_CH 251

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

Medium parameters used: f = 849 MHz; $\sigma = 0.896$ S/m; $\varepsilon_r = 40.97$; $\rho = 1000$ kg/m³

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) = 0.573 W/kg

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

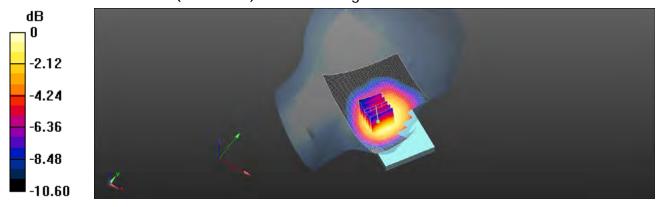
dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.024 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.628 W/kg

SAR(1 g) = 0.490 W/kg; SAR(10 g) = 0.361 W/kg

Maximum value of SAR (measured) = 0.564 W/kg



0 dB = 0.564 W/kq = -2.49 dBW/kq

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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; $\varepsilon_r = 52.754$; $\rho = 1000$ kg/m³

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) = 0.409 W/kg

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

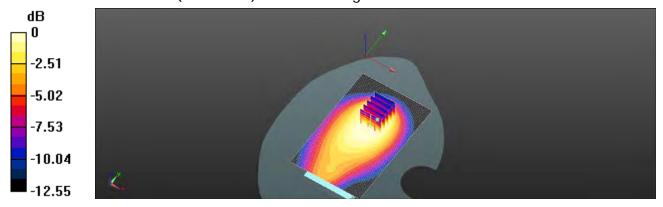
dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.045 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.463 W/kg

SAR(1 g) = 0.319 W/kg; SAR(10 g) = 0.219 W/kg

Maximum value of SAR (measured) = 0.396 W/kg



0 dB = 0.396 W/kg = -4.02 dBW/kg

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GPRS 850_Hotspot mode_Back side_CH 251_10mm

Communication System: GPRS (1Dn1Up); Frequency: 848.8 MHz, Duty factor: 1:8.3 Medium parameters used: f = 849 MHz; $\sigma = 1.027$ S/m; $\varepsilon_r = 52.754$; $\rho = 1000$ kg/m³

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) = 0.824 W/kg

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

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

Reference Value = 27.060 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.916 W/kg SAR(1 g) = 0.700 W/kg; SAR(10 g) = 0.511 W/kg

Maximum value of SAR (measured) = 0.824 W/kg Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

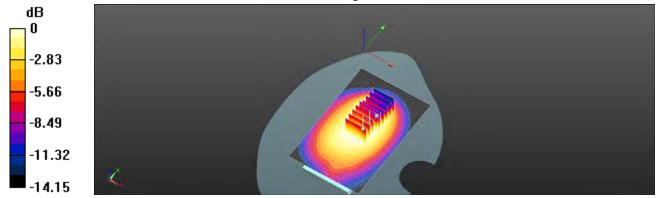
dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.060 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.903 W/kg

SAR(1 g) = 0.607 W/kg; SAR(10 g) = 0.403 W/kg

Maximum value of SAR (measured) = 0.787 W/kg



0 dB = 0.787 W/kg = -1.04 dBW/kg

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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; $\sigma = 1.399 \text{ S/m}$; $\epsilon r = 39.529$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.231 W/kg

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

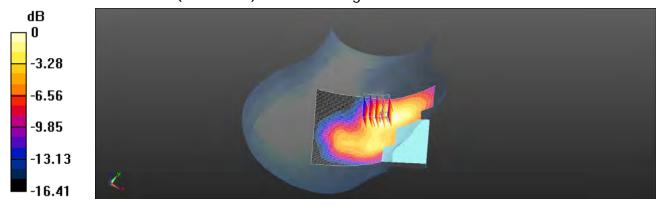
dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.712 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.292 W/kg

SAR(1 g) = 0.187 W/kg; SAR(10 g) = 0.117 W/kg

Maximum value of SAR (measured) = 0.237 W/kg



0 dB = 0.237 W/kg = -6.25 dBW/kg

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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; $\sigma = 1.509 \text{ S/m}$; $\epsilon_r = 51.576$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.411 W/kg

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

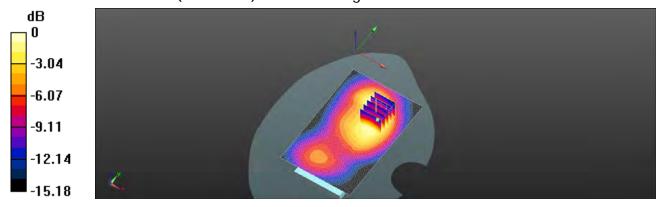
dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.265 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.496 W/kg

SAR(1 g) = 0.312 W/kg; SAR(10 g) = 0.191 W/kg

Maximum value of SAR (measured) = 0.407 W/kg



0 dB = 0.407 W/kg = -3.90 dBW/kg

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GPRS 1900_Hotspot mode_Bottom side_CH 810_10mm

Communication System: GPRS (1Dn1Up); Frequency: 1909.8 MHz, Duty factor: 1:8.3 Medium parameters used: f = 1910 MHz; $\sigma = 1.509$ S/m; $\epsilon_r = 51.576$; $\rho = 1000$ kg/m³

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) = 0.818 W/kg

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

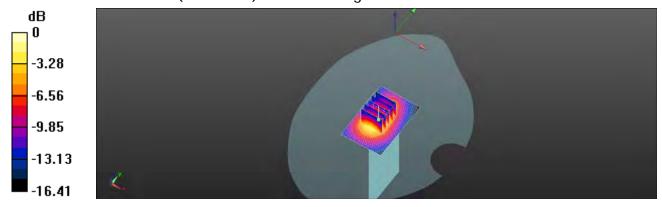
dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.33 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.616 W/kg; SAR(10 g) = 0.338 W/kg

Maximum value of SAR (measured) = 0.841 W/kg



0 dB = 0.841 W/kg = -0.75 dBW/kg

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Date: 2014/11/14

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; $\sigma = 1.399 \text{ S/m}$; $\epsilon_r = 39.529$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.252 W/kg

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

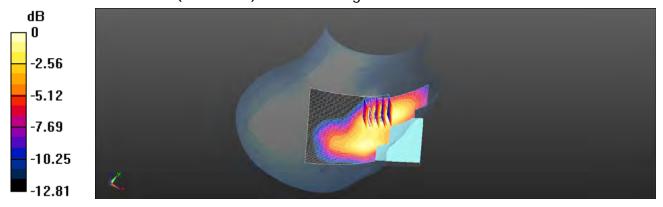
dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.922 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.310 W/kg

SAR(1 g) = 0.205 W/kg; SAR(10 g) = 0.133 W/kg

Maximum value of SAR (measured) = 0.249 W/kg



0 dB = 0.249 W/kg = -6.04 dBW/kg

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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; $\sigma = 1.509 \text{ S/m}$; $\epsilon_r = 51.576$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.440 W/kg

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

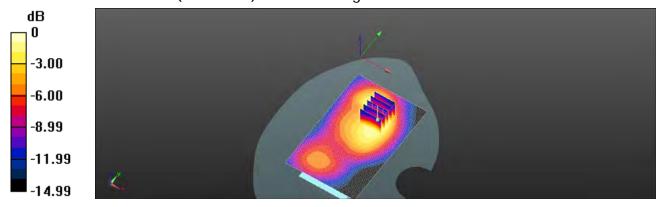
dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.178 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.539 W/kg

SAR(1 g) = 0.338 W/kg; SAR(10 g) = 0.206 W/kg

Maximum value of SAR (measured) = 0.438 W/kg



0 dB = 0.438 W/kg = -3.59 dBW/kg

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GPRS 1900_Hotspot mode_Bottom side_CH 810_10mm

Communication System: GPRS (1Dn1Up); Frequency: 1909.8 MHz, Duty factor: 1:8.3 Medium parameters used: f = 1910 MHz; $\sigma = 1.509 \text{ S/m}$; $\epsilon_r = 51.576$; $\rho = 1000 \text{ kg/m}^3$

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 (41x61x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.882 W/kg

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

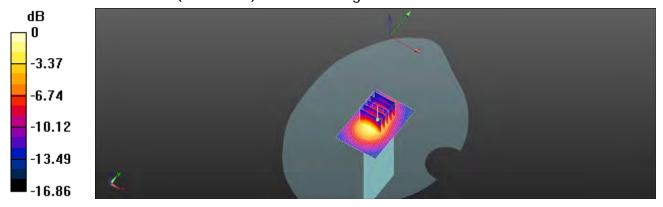
dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.755 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.666 W/kg; SAR(10 g) = 0.367 W/kg

Maximum value of SAR (measured) = 0.906 W/kg



0 dB = 0.906 W/kq = -0.43 dBW/kq

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WCDMA Band 2 _Head_Le Cheek_CH 9538

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

Medium parameters used: f = 1908 MHz; $\sigma = 1.417 \text{ S/m}$; $\epsilon r = 39.537$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left 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) = 0.371 W/kg

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

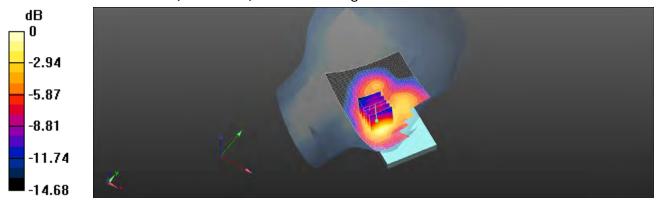
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.658 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.426 W/kg

SAR(1 g) = 0.282 W/kg; SAR(10 g) = 0.174 W/kg

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



0 dB = 0.357 W/kq = -4.47 dBW/kq

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WCDMA Band 2_Speech mode_Back side_CH 9400

Communication System: WCDMA; Frequency: 1880 MHz, Duty factor: 1:1

Medium parameters used: f = 1880 MHz; $\sigma = 1.473 \text{ S/m}$; $\epsilon_r = 51.693$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.766 W/kg

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

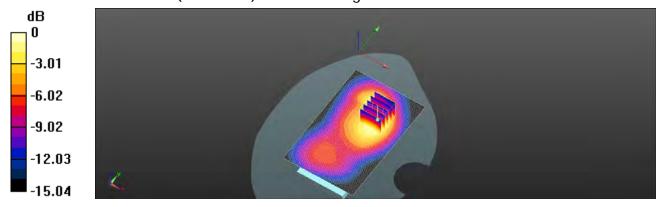
dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.20 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.957 W/kg

SAR(1 g) = 0.592 W/kg; SAR(10 g) = 0.367 W/kg

Maximum value of SAR (measured) = 0.775 W/kg



0 dB = 0.775 W/kg = -1.11 dBW/kg

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WCDMA Band 2_Hotspot mode_Bottom side_CH 9538_10mm

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

Medium parameters used: f = 1908 MHz; $\sigma = 1.507$ S/m; $\varepsilon_r = 51.579$; $\rho = 1000$ kg/m³

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) = 1.51 W/kg

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

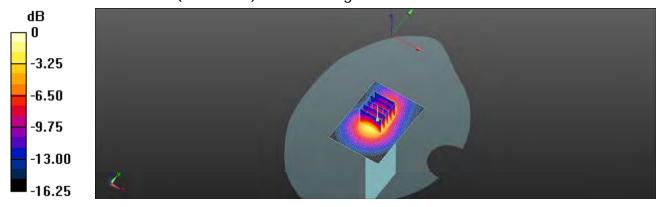
dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.47 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.611 W/kg

Maximum value of SAR (measured) = 1.51 W/kg



0 dB = 1.51 W/kg = 1.79 dBW/kg

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WCDMA Band 2 _Head_Le Cheek_CH 9538

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

Medium parameters used: f = 1908 MHz; $\sigma = 1.417$ S/m; $\epsilon_r = 39.537$; $\rho = 1000$ kg/m³

Phantom section: Left 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) = 0.666 W/kg

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

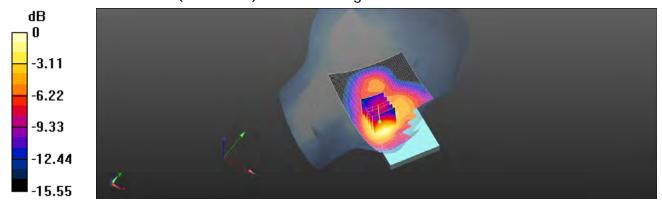
dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.123 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.699 W/kg

SAR(1 g) = 0.457 W/kg; SAR(10 g) = 0.285 W/kg

Maximum value of SAR (measured) = 0.568 W/kg



0 dB = 0.568 W/kq = -2.46 dBW/kq

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WCDMA Band 2_Speech mode_Back side_CH 9538_15mm

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

Medium parameters used: f = 1908 MHz; $\sigma = 1.507$ S/m; $\varepsilon_r = 51.579$; $\rho = 1000$ kg/m³

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) = 1.45 W/kg

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

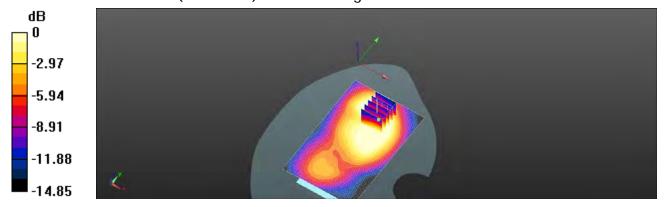
dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.060 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.830 W/kg

SAR(1 g) = 0.524 W/kg; SAR(10 g) = 0.326 W/kg

Maximum value of SAR (measured) = 0.686 W/kg



0 dB = 0.686 W/kg = -1.64 dBW/kg

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WCDMA Band 2_Hotspot mode_Bottom side_CH 9538_10mm

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

Medium parameters used: f = 1908 MHz; $\sigma = 1.507$ S/m; $\varepsilon_r = 51.579$; $\rho = 1000$ kg/m³

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) = 1.68 W/kg

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

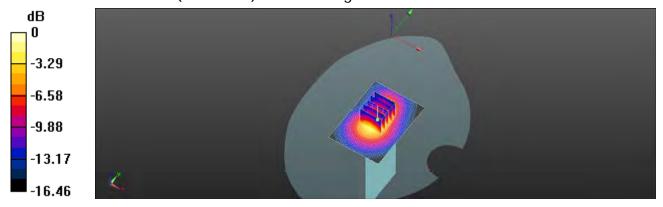
dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.110 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 2.03 W/kg

SAR(1 g) = 1.23 W/kg; SAR(10 g) = 0.678 W/kg

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



0 dB = 1.68 W/kg = 2.25 dBW/kg

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Date: 2014/11/13

WCDMA Band 5 Head Le Cheek CH 4233

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

Medium parameters used: f = 847 MHz; $\sigma = 0.894 \text{ S/m}$; $\varepsilon_r = 40.997$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.480 W/kg

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

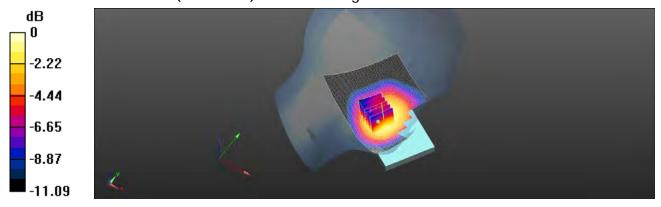
dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.524 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.586 W/kg

SAR(1 g) = 0.451 W/kg; SAR(10 g) = 0.330 W/kg

Maximum value of SAR (measured) = 0.519 W/kg



0 dB = 0.519 W/kg = -2.85 dBW/kg

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WCDMA Band 5_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; $\varepsilon_r = 52.772$; $\rho = 1000$ kg/m³

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) = 0.382 W/kg

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

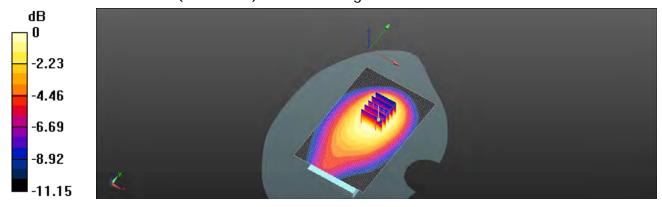
dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.15 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.444 W/kg

SAR(1 g) = 0.316 W/kg; SAR(10 g) = 0.226 W/kg

Maximum value of SAR (measured) = 0.383 W/kg



0 dB = 0.383 W/kg = -4.17 dBW/kg

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WCDMA Band 5_Hotspot mode_Back side_CH 4132_10mm

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

Medium parameters used: f = 826.4 MHz; $\sigma = 1.003$ S/m; $\varepsilon_r = 52.954$; $\rho = 1000$ kg/m³

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) = 0.921 W/kg

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

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

Reference Value = 27.36 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.788 W/kg; SAR(10 g) = 0.577 W/kg Maximum value of SAR (measured) = 0.922 W/kg Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

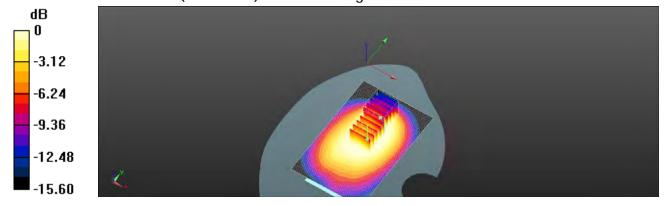
dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.36 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.968 W/kg

SAR(1 g) = 0.622 W/kg; SAR(10 g) = 0.410 W/kg

Maximum value of SAR (measured) = 0.783 W/kg



0 dB = 0.783 W/kq = -1.06 dBW/kq

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Date: 2014/11/13

WCDMA Band 5 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; $\varepsilon_r = 40.997$; $\rho = 1000$ kg/m³

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) = 0.469 W/kg

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

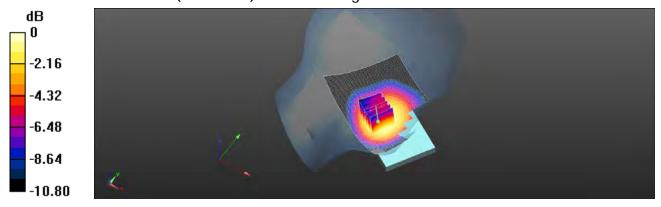
dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.301 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.515 W/kg

SAR(1 g) = 0.396 W/kg; SAR(10 g) = 0.290 W/kg

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



0 dB = 0.460 W/kq = -3.37 dBW/kq

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Date: 2014/11/15

WCDMA Band 5_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; $\varepsilon_r = 52.772$; $\rho = 1000$ kg/m³

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) = 0.304 W/kg

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

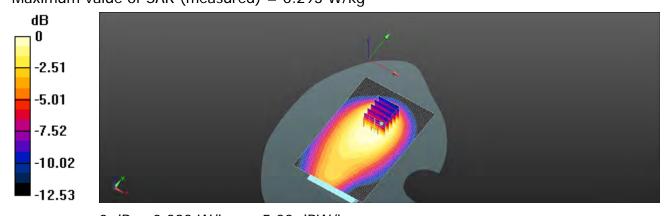
dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.782 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.345 W/kg

SAR(1 g) = 0.236 W/kg; SAR(10 g) = 0.162 W/kg

Maximum value of SAR (measured) = 0.293 W/kg



0 dB = 0.293 W/kg = -5.33 dBW/kg

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Date: 2014/11/15

WCDMA Band 5_Hotspot mode_Back side_CH 4132_10mm

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

Medium parameters used: f = 826.4 MHz; $\sigma = 1.003 \text{ S/m}$; $\varepsilon_r = 52.954$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.803 W/kg

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

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

Reference Value = 26.203 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.895 W/kg SAR(1 g) = 0.680 W/kg; SAR(10 g) = 0.495 W/kg

Maximum value of SAR (measured) = 0.799 W/kg Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

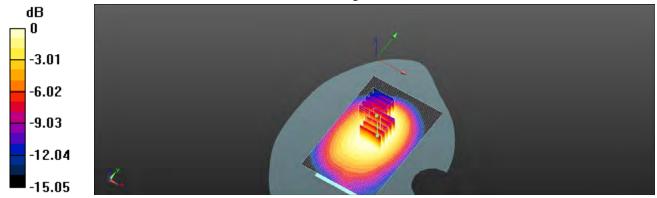
dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.203 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.876 W/kg

SAR(1 g) = 0.590 W/kg; SAR(10 g) = 0.391 W/kg

Maximum value of SAR (measured) = 0.770 W/kg



0 dB = 0.770 W/kg = -1.14 dBW/kg

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Date: 2014/11/20

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; $\sigma = 1.432 \text{ S/m}$; $\epsilon_r = 39.256$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.42, 8.42, 8.42); 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) = 0.597 W/kg

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

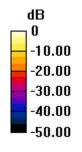
dx=8mm, dy=8mm, dz=5mm

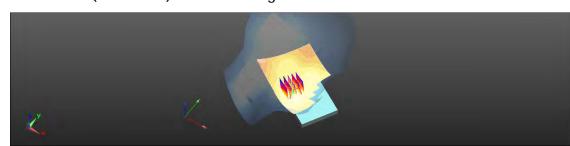
Reference Value = 7.270 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.674 W/kg

SAR(1 g) = 0.446 W/kg; SAR(10 g) = 0.278 W/kg

Maximum value of SAR (measured) = 0.564 W/kg





0 dB = 0.597 W/kq = -2.24 dBW/kq

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Date: 2014/11/24

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; $\sigma = 1.552 \text{ S/m}$; $\epsilon r = 54.065$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.03, 8.03, 8.03); 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) = 0.883 W/kg

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

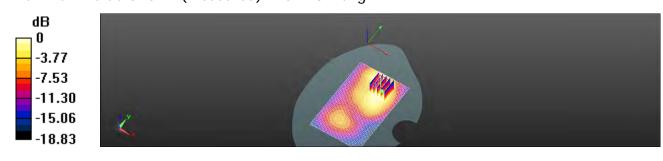
dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.38 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.682 W/kg; SAR(10 g) = 0.402 W/kg

Maximum value of SAR (measured) = 0.913 W/kg



0 dB = 0.883 W/kg = -0.54 dBW/kg

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Date: 2014/12/08

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; $\sigma = 1.435 \text{ S/m}$; $\epsilon_r = 39.356$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.42, 8.42, 8.42); 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) = 0.677 W/kg

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

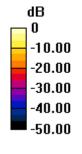
dx=8mm, dy=8mm, dz=5mm

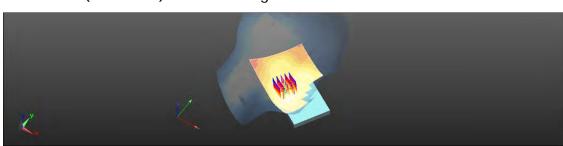
Reference Value = 7.699 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.782 W/kg

SAR(1 g) = 0.495 W/kg; SAR(10 g) = 0.297 W/kg

Maximum value of SAR (measured) = 0.626 W/kg





0 dB = 0.677 W/kq = -1.69 dBW/kq

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Date: 2014/11/24

LTE Band 2 (20MHz)_Hotspot_Back side_CH 19100_QPSK_1-99_10mm_repeated

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.552 \text{ S/m}$; $\epsilon r = 54.065$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.03, 8.03, 8.03); 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) = 1.72 W/kg

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

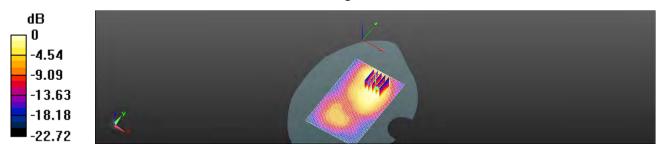
dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.01 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 2.16 W/kg

SAR(1 g) = 1.26 W/kg; SAR(10 g) = 0.721 W/kg

Maximum value of SAR (measured) = 1.71 W/kg



0 dB = 1.72 W/kg = 2.36 dBW/kg

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Date: 2014/12/08

LTE Band 2 (20MHz)_Hotspot_Back side_CH 19100_QPSK_1-99_10mm_repeated

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.556 \text{ S/m}$; $\epsilon_r = 54.165$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.03, 8.03, 8.03); 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) = 1.83 W/kg

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

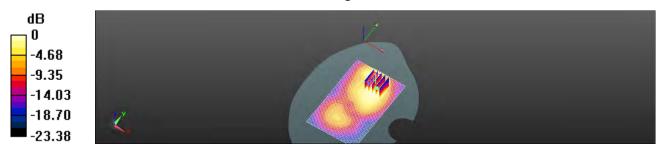
dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.58 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.36 W/kg; SAR(10 g) = 0.785 W/kg

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



0 dB = 1.83 W/kg = 2.62 dBW/kg

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Date: 2014/11/18

LTE Band 5 (10MHz)_Head_Le Cheek_CH 20450_QPSK_1-0

Communication System: LTE; Frequency: 829 MHz, Duty factor: 1:1

Medium parameters used: f = 829 MHz; $\sigma = 0.876$ S/m; $\epsilon r = 40.237$; $\rho = 1000$ kg/m³

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) = 0.508 W/kg

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

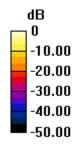
dx=8mm, dy=8mm, dz=5mm

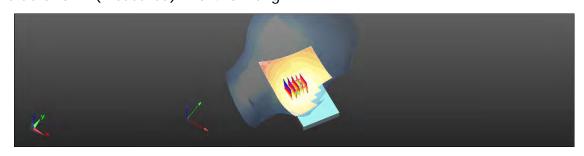
Reference Value = 6.817 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.546 W/kg

SAR(1 g) = 0.439 W/kg; SAR(10 g) = 0.332 W/kg

Maximum value of SAR (measured) = 0.495 W/kg





0 dB = 0.508 W/kq = -2.94 dBW/kq

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Date: 2014/11/19

LTE Band 5 (10MHz)_Body-worn_Back side_CH 20600_QPSK_1-49_15mm

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

Medium parameters used: f = 844 MHz; $\sigma = 0.991$ S/m; $\epsilon r = 53.572$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.32, 10.32, 10.32); 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) = 0.476 W/kg

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

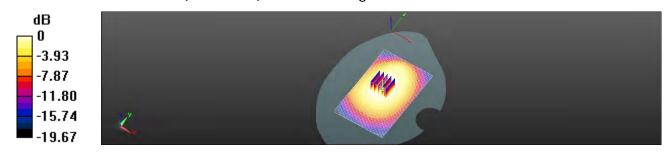
dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.70 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.530 W/kg

SAR(1 g) = 0.415 W/kg; SAR(10 g) = 0.312 W/kg

Maximum value of SAR (measured) = 0.481 W/kg



0 dB = 0.476 W/kg = -3.22 dBW/kg

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Date: 2014/12/08

LTE Band 5 (10MHz)_Head_Le Cheek_CH 20450_QPSK_1-0

Communication System: LTE; Frequency: 829 MHz, Duty factor: 1:1

Medium parameters used: f = 829 MHz; $\sigma = 0.871$ S/m; $\varepsilon_r = 40.239$; $\rho = 1000$ kg/m³

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) = 0.535 W/kg

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

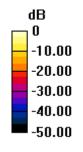
dx=8mm, dy=8mm, dz=5mm

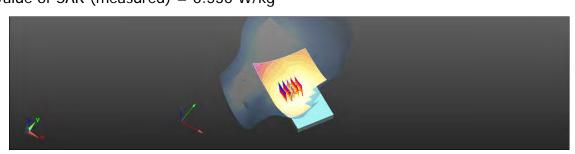
Reference Value = 5.703 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.599 W/kg

SAR(1 g) = 0.460 W/kg; SAR(10 g) = 0.346 W/kg

Maximum value of SAR (measured) = 0.530 W/kg





0 dB = 0.535 W/kq = -2.72 dBW/kq

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Date: 2014/11/19

LTE Band 5 (10MHz)_Hotspot_Back side_CH 20600_QPSK_1-49_10mm

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

Medium parameters used: f = 844 MHz; $\sigma = 0.991$ S/m; $\epsilon r = 53.572$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.32, 10.32, 10.32); 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) = 0.622 W/kg

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

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

Reference Value = 25.26 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.685 W/kg

SAR(1 g) = 0.431 W/kg; SAR(10 g) = 0.294 W/kg

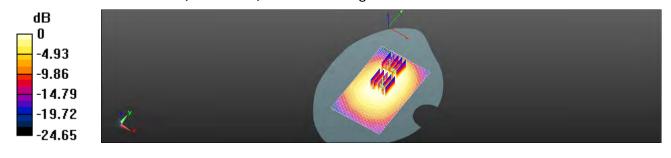
Maximum value of SAR (measured) = 0.549 W/kg Configuration/Head/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

dx=8mm, dy=8mm, dz=5mm Reference Value = 25.26 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.678 W/kg

SAR(1 g) = 0.534 W/kg; SAR(10 g) = 0.405 W/kg

Maximum value of SAR (measured) = 0.615 W/kg



0 dB = 0.622 W/kq = -2.06 dBW/kq

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Date: 2014/12/08

LTE Band 5 (10MHz)_Hotspot_Back side_CH 20600_QPSK_1-49_10mm

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

Medium parameters used: f = 844 MHz; $\sigma = 1.001$ S/m; $\varepsilon_r = 53.261$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.32, 10.32, 10.32); 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 (61x101x1): Interpolated grid: dx=15 mm,

dy=15 mm

Maximum value of SAR (interpolated) = 0.671 W/kg

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

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

Reference Value = 25.5 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.760 W/kg

SAR(1 g) = 0.575 W/kg; SAR(10 g) = 0.435 W/kg

Maximum value of SAR (measured) = 0.662 W/kg

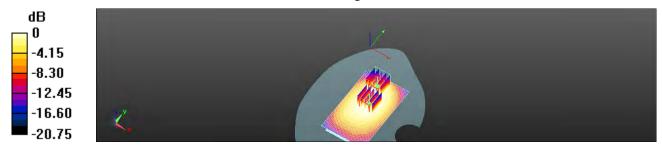
Configuration/Head/Zoom Scan (5x5x7)/Cube 1: Measurement grid:

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

Reference Value = 25.5 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 0.749 W/kg

SAR(1 g) = 0.556 W/kg; SAR(10 g) = 0.371 W/kg

Maximum value of SAR (measured) = 0.622 W/kg



0 dB = 0.671 W/kg = -1.73 dBW/kg

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Date: 2014/11/22

LTE Band 7 (20MHz)_Head_Re Cheek_CH 21350_QPSK_1-99

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

Medium parameters used: f = 2560 MHz; $\sigma = 1.948 \text{ S/m}$; $\epsilon r = 40.487$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.375 W/kg

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

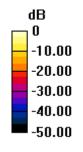
dx=5mm, dy=5mm, dz=5mm

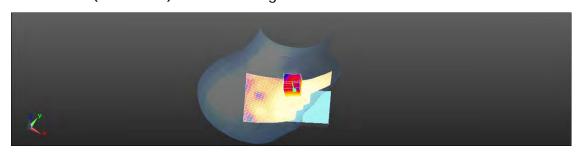
Reference Value = 1.895 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.476 W/kg

SAR(1 g) = 0.247 W/kg; SAR(10 g) = 0.128 W/kg

Maximum value of SAR (measured) = 0.351 W/kg





0 dB = 0.375 W/kq = -4.26 dBW/kq

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Date: 2014/11/27

LTE Band 7 (20MHz)_Body-worn_Back side_CH 21100_QPSK_1-99_15mm

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

Medium parameters used: f = 2535 MHz; $\sigma = 2.019 \text{ S/m}$; $\epsilon r = 52.992$; $\rho = 1000 \text{ kg/m}^3$

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 (81x131x1): Interpolated grid: dx=12 mm,

dy=12 mm

Maximum value of SAR (interpolated) = 1.19 W/kg

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

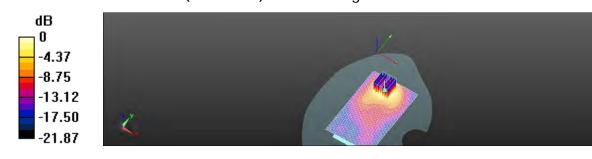
dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.994 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.803 W/kg; SAR(10 g) = 0.401 W/kg

Maximum value of SAR (measured) = 1.19 W/kg



0 dB = 1.19 W/kg = 0.76 dBW/kg

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Date: 2014/12/08

LTE Band 7 (20MHz)_Head_Re Cheek_CH 21350_QPSK_1-99

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

Medium parameters used: f = 2560 MHz; $\sigma = 1.938 \text{ S/m}$; $\epsilon_r = 40.635$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.353 W/kg

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

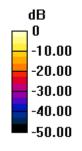
dx=5mm, dy=5mm, dz=5mm

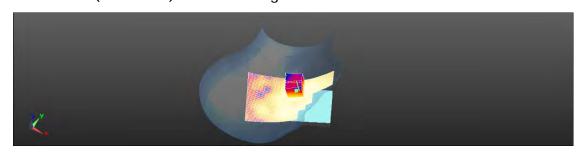
Reference Value = 1.528 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.445 W/kg

SAR(1 g) = 0.239 W/kg; SAR(10 g) = 0.125 W/kg

Maximum value of SAR (measured) = 0.336 W/kg





0 dB = 0.353 W/kq = -4.52 dBW/kq

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Date: 2014/11/27

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; $\sigma = 2.044 \text{ S/m}$; $\epsilon r = 52.811$; $\rho = 1000 \text{ kg/m}^3$

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 (81x141x1): Interpolated grid: dx=12 mm,

dy=12 mm

Maximum value of SAR (interpolated) = 1.76 W/kg

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

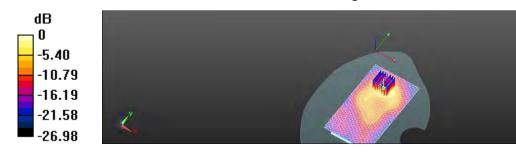
dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.42 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.561 W/kg

Maximum value of SAR (measured) = 1.71 W/kg



0 dB = 1.76 W/kg = 2.46 dBW/kg

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Date: 2014/12/08

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; $\sigma = 2.034 \text{ S/m}$; $\epsilon_r = 52.882$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(7.56, 7.56, 7.56); 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) = 1.68 W/kg

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

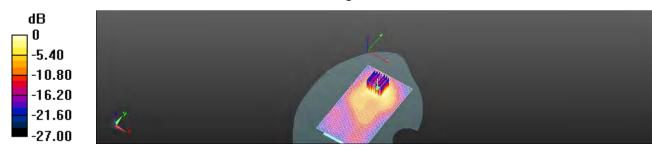
dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.773 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.544 W/kg

Maximum value of SAR (measured) = 1.61 W/kg



0 dB = 1.68 W/kg = 2.25 dBW/kg

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Date: 2014/11/23

WLAN802.11b_Head_RE Cheek_CH 6

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz,

Duty factor: 1:1

Medium parameters used: f = 2437 MHz; $\sigma = 1.808$ S/m; $\epsilon_r = 39.231$; $\rho = 1000$ kg/m³

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) = 0.867 W/kg

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

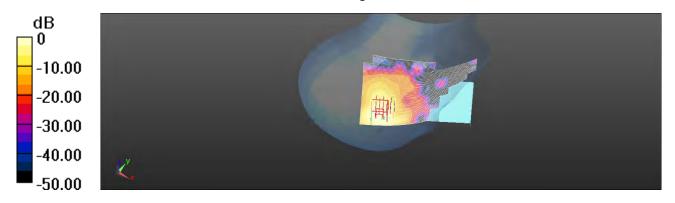
dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.885 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.514 W/kg; SAR(10 g) = 0.237 W/kg

Maximum value of SAR (measured) = 0.773 W/kg



0 dB = 0.867 W/kg = -0.62 dBW/kg

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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) = 0.859 W/kg

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

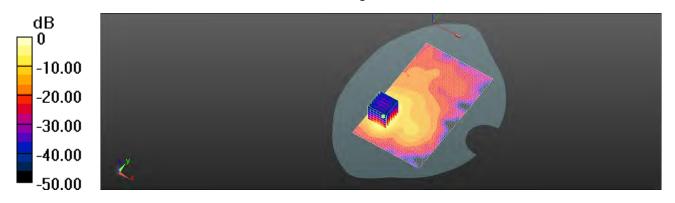
dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.287 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.546 W/kg; SAR(10 g) = 0.245 W/kg

Maximum value of SAR (measured) = 0.842 W/kg



0 dB = 0.859 W/kg = -0.66 dBW/kg

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Date: 2014/11/23

WLAN802.11b_Head_RE Cheek_CH 6

Communication System: WLAN802.11 b & g & n(20M)(40M); Frequency: 2437 MHz,

Duty factor: 1:1

Medium parameters used: f = 2437 MHz; $\sigma = 1.808$ S/m; $\varepsilon_r = 39.231$; $\rho = 1000$ kg/m³

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) = 0.658 W/kg

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

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

Reference Value = 8.858 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.883 W/kg

SAR(1 g) = 0.419 W/kg; SAR(10 g) = 0.207 W/kg

Maximum value of SAR (measured) = 0.617 W/kg



0 dB = 0.658 W/kg = -1.82 dBW/kg

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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) = 0.939 W/kg

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

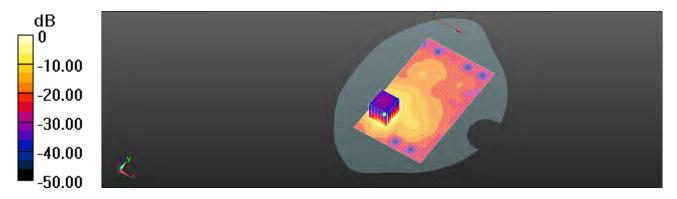
dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.066 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.574 W/kg; SAR(10 g) = 0.254 W/kg

Maximum value of SAR (measured) = 0.908 W/kg



0 dB = 0.939 W/kg = -0.27 dBW/kg

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Date: 2014/11/17

WLAN802.11a 5.2G_Head_RE Tilt_CH 48

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5240 MHz

,Duty factor: 1:1

Medium parameters used: f = 5240 MHz; $\sigma = 4.668 \text{ S/m}$; $\epsilon_r = 36.072$; $\rho = 1000 \text{ kg/m}^3$

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) = 0.356 W/kg

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

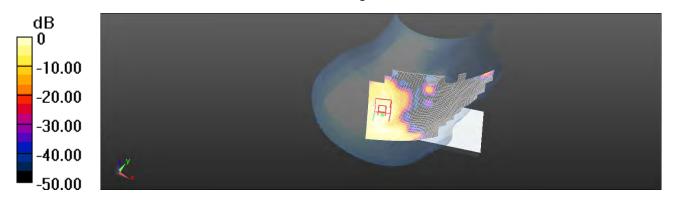
dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.062 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.823 W/kg

SAR(1 g) = 0.204 W/kg; SAR(10 g) = 0.070 W/kg

Maximum value of SAR (measured) = 0.392 W/kg



0 dB = 0.356 W/kg = -4.49 dBW/kg

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Date: 2014/11/19

WLAN802.11a 5.2G_Body-worn_Back side_CH 48_15mm

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5240 MHz, Duty factor: 1:1 Medium parameters used: f = 5240 MHz; $\sigma = 5.474 \text{ S/m}$; $\epsilon_r = 48.347$; $\rho = 1000 \text{ kg/m}^3$ 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/Body-worn_/Area Scan (111x181x1): Interpolated grid:

dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.482 W/kg

Configuration/Body-worn_/Zoom Scan (7x7x12)/Cube 0: Measurement

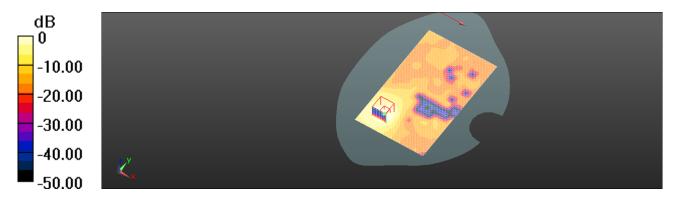
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.587 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.917 W/kg

SAR(1 g) = 0.265 W/kg; SAR(10 g) = 0.112 W/kg

Maximum value of SAR (measured) = 0.473 W/kg



0 dB = 0.482 W/kg = -3.17 dBW/kg

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Date: 2014/11/18

WLAN802.11a 5.3G_Head_RE Cheek_CH 64

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5320 MHz, Duty factor: 1:1 Medium parameters used: f = 5320 MHz; $\sigma = 4.767 \text{ S/m}$; $\epsilon_r = 35.798$; $\rho = 1000 \text{ kg/m}^3$ 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 Cheek/Area Scan (111x181x1): Interpolated grid: dx=10

mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.424 W/kg

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

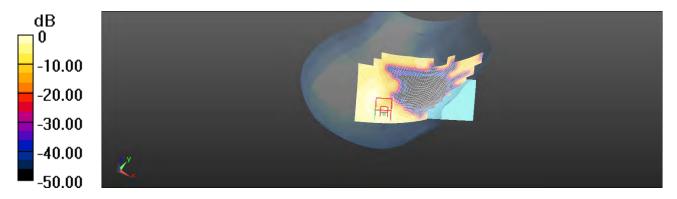
dx=4mm, dy=4mm, dz=2mm

Reference Value = 4.481 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.088 W/kg

Maximum value of SAR (measured) = 0.440 W/kg



0 dB = 0.424 W/kg = -3.73 dBW/kg

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Date: 2014/11/19

WLAN802.11a 5.3G_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; $\sigma = 5.59 \text{ S/m}$; $\varepsilon_r = 48.196$; $\rho = 1000 \text{ kg/m}^3$

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/Body-worn_/Area Scan (111x181x1): Interpolated grid:

dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.507 W/kg

Configuration/Body-worn_/Zoom Scan (7x7x12)/Cube 0: Measurement

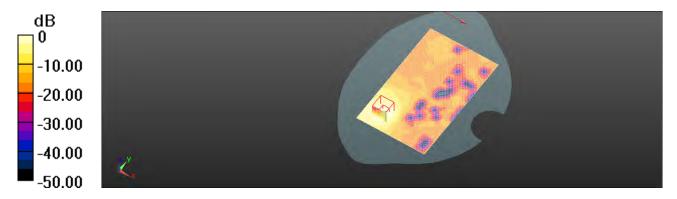
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.600 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.978 W/kg

SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.109 W/kg

Maximum value of SAR (measured) = 0.489 W/kg



0 dB = 0.507 W/kg = -2.95 dBW/kg

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Date: 2014/11/17

WLAN802.11a 5.6G_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) = 0.771 W/kg

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

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

Reference Value = 6.271 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 0.410 W/kg; SAR(10 g) = 0.136 W/kg

Maximum value of SAR (measured) = 0.792 W/kg Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 1: Measurement grid:

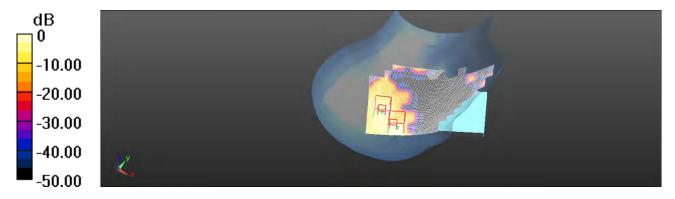
dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.271 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 0.359 W/kg; SAR(10 g) = 0.127 W/kg

Maximum value of SAR (measured) = 0.732 W/kg



0 dB = 0.771 W/kg = -1.13 dBW/kg

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Date: 2014/11/19

WLAN802.11a 5.6G_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; $\sigma=6.058$ S/m; $\epsilon_r=47.18$; $\rho=1000$ kg/m³ 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-worn_/Area Scan (111x181x1): Interpolated grid:

dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.728 W/kg

Configuration/Body-worn_/Zoom Scan (7x7x12)/Cube 0: Measurement

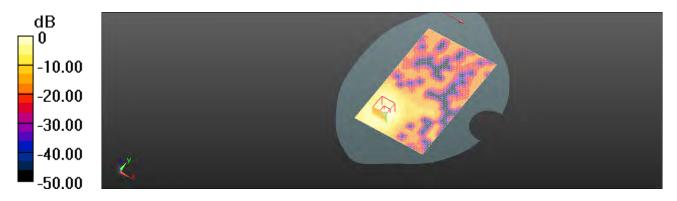
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.463 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.388 W/kg; SAR(10 g) = 0.157 W/kg

Maximum value of SAR (measured) = 0.714 W/kg



0 dB = 0.728 W/kg = -1.38 dBW/kg

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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) = 0.658 W/kg

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

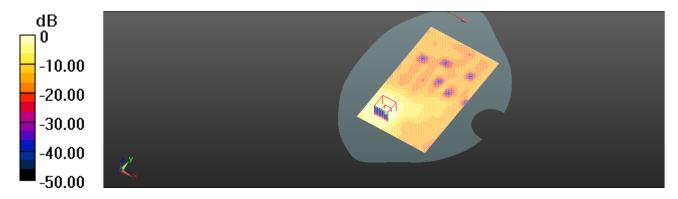
dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.217 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.361 W/kg; SAR(10 g) = 0.153 W/kg

Maximum value of SAR (measured) = 0.661 W/kg



0 dB = 0.658 W/kg = -1.82 dBW/kg

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Date: 2014/11/18

WLAN802.11a 5.8G_Head_RE Cheek_CH 157

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5785 MHz, Duty factor: 1:1 Medium parameters used : f = 5785 MHz; $\sigma = 5.305$ S/m; $\varepsilon_r = 34.724$; $\rho = 1000$ kg/m³ 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) = 1.02 W/kg

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

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

Reference Value = 5.151 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 0.491 W/kg; SAR(10 g) = 0.159 W/kg
Maximum value of SAR (measured) = 1.01 W/kg
Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 1: Measurement grid:

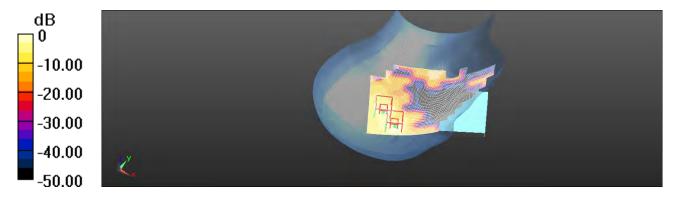
dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.151 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.96 W/kg

SAR(1 g) = 0.400 W/kg; SAR(10 g) = 0.129 W/kg

Maximum value of SAR (measured) = 0.846 W/kg



0 dB = 1.02 W/kg = 0.07 dBW/kg

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Date: 2014/11/19

WLAN802.11 a 5.8G_Body-worn_Back side_CH 161_15mm

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5805 MHz, Duty factor: 1:1 Medium parameters used : f = 5805 MHz; $\sigma = 6.213$ S/m; $\varepsilon_r = 46.936$; $\rho = 1000$ kg/m³ 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-worn_/Area Scan (111x181x1): Interpolated grid:

dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.671 W/kg

Configuration/Body-worn_/Zoom Scan (7x7x12)/Cube 0: Measurement

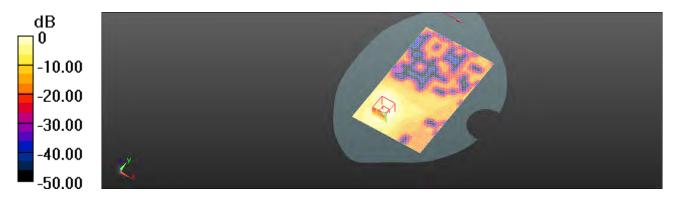
grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.747 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.42 W/kg

SAR(1 g) = 0.346 W/kg; SAR(10 g) = 0.131 W/kg

Maximum value of SAR (measured) = 0.661 W/kg



0 dB = 0.671 W/kg = -1.73 dBW/kg

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Date: 2014/11/18

WLAN802.11a5.8G_Head_RE Cheek_CH 157

Communication System: WLAN 802.11n/a(5G) FCC; Frequency: 5785 MHz,

Duty factor: 1:1

Medium parameters used : f = 5785 MHz; $\sigma = 5.305$ S/m; $\varepsilon_r = 34.724$; $\rho = 1000$ kg/m³

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) = 0.737 W/kg

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

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

Reference Value = 4.030 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.81 W/kg

SAR(1 g) = 0.401 W/kg; SAR(10 g) = 0.147 W/kg

Maximum value of SAR (measured) = 0.818 W/kg Configuration/RE Cheek/Zoom Scan (7x7x12)/Cube 1: Measurement grid:

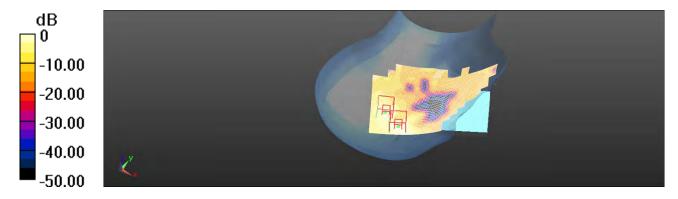
dx=4mm, dy=4mm, dz=2mm

Reference Value = 4.030 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 0.332 W/kg; SAR(10 g) = 0.123 W/kg

Maximum value of SAR (measured) = 0.664 W/kg



0 dB = 0.737 W/kg = -1.33 dBW/kg

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6. System Verification

Date: 2014/11/13

Dipole 835 MHz_SN:4d063_Head

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz; $\sigma = 0.883$ S/m; $\varepsilon_r = 41.147$; $\rho = 1000$ kg/m³

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) = 3.75 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

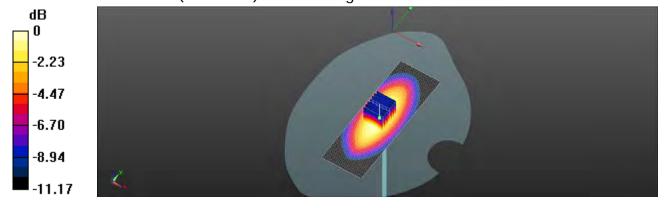
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 66.27 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 4.45 W/kg

SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.49 W/kg

Maximum value of SAR (measured) = 3.76 W/kg



0 dB = 3.76 W/kq = 5.75 dBW/kq

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Date: 2014/11/15

Dipole 835 MHz_SN:4d063_Body

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz; $\sigma = 1.012$ S/m; $\varepsilon_r = 52.878$; $\rho = 1000$ kg/m³

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) = 3.46 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

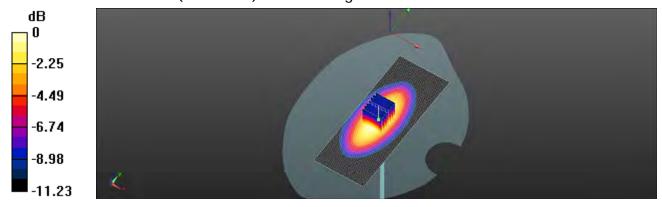
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.62 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 4.13 W/kg

SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (measured) = 3.49 W/kg



0 dB = 3.49 W/kg = 5.43 dBW/kg

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Date: 2014/11/14

Dipole 1900 MHz_SN: 5d027_Head

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.389 \text{ S/m}$; $\epsilon_r = 39.566$; $\rho = 1000 \text{ kg/m}^3$

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) = 15.7 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

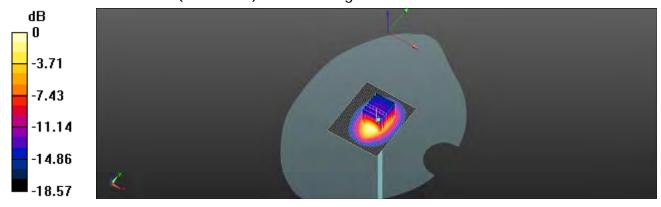
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.7 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 19.1 W/kg

SAR(1 g) = 9.77 W/kg; SAR(10 g) = 5.16 W/kg

Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

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Date: 2014/11/15

Dipole 1900 MHz_SN: 5d027_Body

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.497 \text{ S/m}$; $\epsilon_r = 51.597$; $\rho = 1000 \text{ kg/m}^3$

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) = 23.9 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

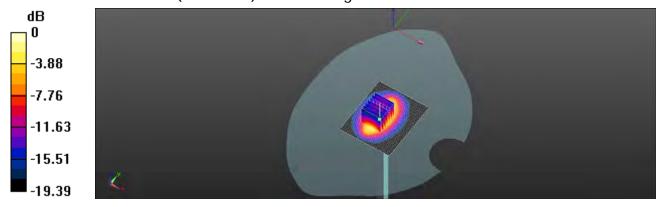
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 124.6 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 33.9 W/kg

SAR(1 g) = 9.81 W/kg; SAR(10 g) = 5.26 W/kg

Maximum value of SAR (measured) = 23.7 W/kg



0 dB = 23.7 W/kg = 13.75 dBW/kg

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Date: 2014/11/18

Dipole 835 MHz_SN:4d063_Head

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz; $\sigma = 0.879$ S/m; $\epsilon_r = 40.231$; $\rho = 1000$ kg/m³

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) = 2.96 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

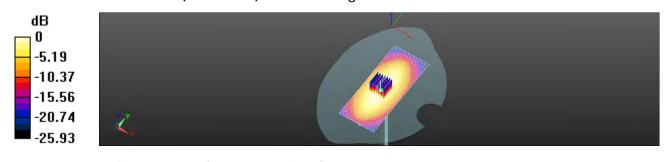
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.41 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.54 W/kg

SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.55 W/kg

Maximum value of SAR (measured) = 2.99 W/kg



0 dB = 2.96 W/kq = 4.71 dBW/kq

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Date: 2014/11/19

Dipole 835 MHz_SN:4d063_Body

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz; $\sigma = 0.981$ S/m; $\varepsilon_r = 53.663$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

• Probe: EX3DV4 - SN3923; ConvF(10.32, 10.32, 10.32); 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 (51x111x1): Interpolated grid:

dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.91 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

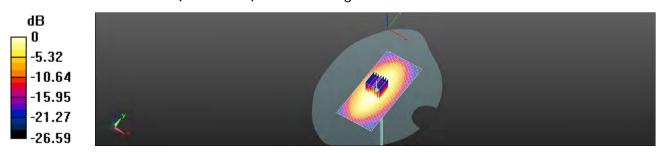
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.00 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.42 W/kg

SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.5 W/kg

Maximum value of SAR (measured) = 2.91 W/kg



0 dB = 2.91 W/kq = 4.64 dBW/kq

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Date: 2014/12/08

Dipole 835 MHz_SN:4d063_Head

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz; $\sigma = 0.879$ S/m; $\epsilon_r = 40.231$; $\rho = 1000$ kg/m³

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) = 2.96 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

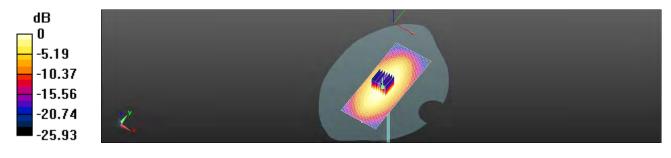
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.005 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.54 W/kg

SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.59 W/kg

Maximum value of SAR (measured) = 2.99 W/kg



0 dB = 2.96 W/kg = 4.71 dBW/kg

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Date: 2014/12/08

Dipole 835 MHz_SN:4d063_Body

Communication System: CW; Frequency: 835 MHz, Duty factor: 1:1

Medium parameters used: f = 835 MHz; $\sigma = 0.96$ S/m; $\varepsilon_r = 53.353$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(10.32, 10.32, 10.32); 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 (51x111x1): Interpolated grid:

dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.91 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

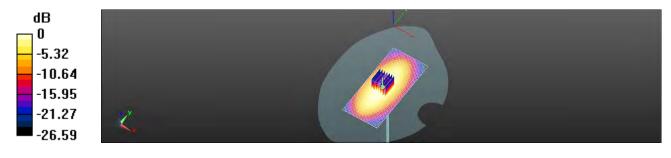
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.981 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.42 W/kg

SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.53 W/kg

Maximum value of SAR (measured) = 2.91 W/kg



0 dB = 2.91 W/kg = 4.64 dBW/kg

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Date: 2014/11/20

Dipole 1900 MHz_SN:5d027_Head

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.432 \text{ S/m}$; $\epsilon_r = 39.256$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.42, 8.42, 8.42); 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 (41x81x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.7 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

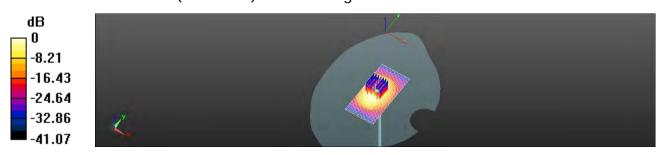
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.131 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 19.3 W/kg

SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.17 W/kg

Maximum value of SAR (measured) = 14.8 W/kg



0 dB = 14.7 W/kq = 11.67 dBW/kq

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Date: 2014/11/24

Dipole 1900 MHz_SN:5d027_Body

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.552 \text{ S/m}$; $\epsilon_r = 54.065$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.03, 8.03, 8.03); 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 (51x101x1): Interpolated grid:

dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.4 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

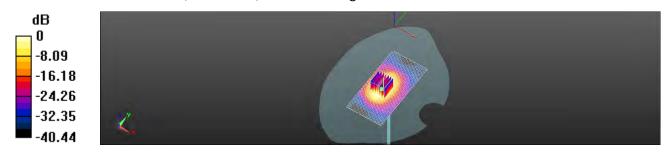
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.91 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.32 W/kg

Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kq = 11.61 dBW/kq

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Date: 2014/12/08

Dipole 1900 MHz_SN:5d027_Head

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.435 \text{ S/m}$; $\epsilon_r = 39.356$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.42, 8.42, 8.42); 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 (41x81x1): Interpolated grid: dx=15

mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.7 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

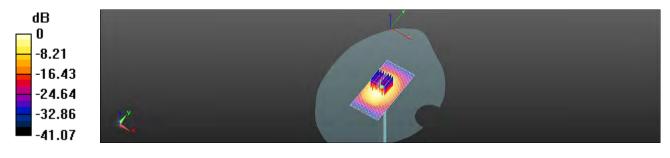
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.13 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 19.3 W/kg

SAR(1 g) = 9.84 W/kg; SAR(10 g) = 5.18 W/kg

Maximum value of SAR (measured) = 14.8 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

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Date: 2014/12/08

Dipole 1900 MHz_SN:5d027_Body

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

Medium parameters used: f = 1900 MHz; $\sigma = 1.556 \text{ S/m}$; $\epsilon_r = 54.165$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(8.03, 8.03, 8.03); 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 (51x101x1): Interpolated grid:

dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.9 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

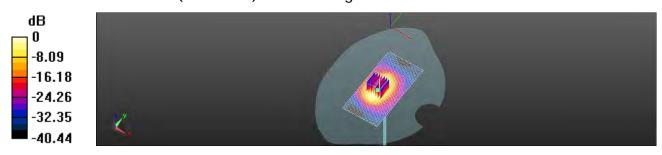
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.423 V/m: Power Drift = 0.01 dB

Peak SAR (extrapolated) = 23.4 W/kg

SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.31 W/kg

Maximum value of SAR (measured) = 15.1 W/kg



0 dB = 15.1 W/kq = 11.79 dBW/kq

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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

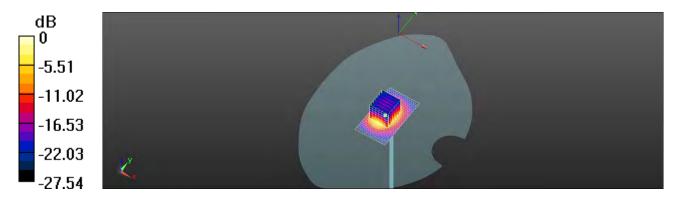
grid: dx=5mm, dy=5mm, dz=5mm

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/kg = 13.47 dBW/kg

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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

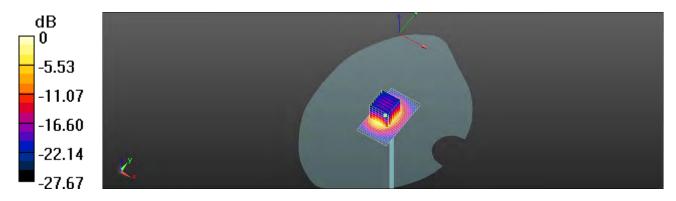
grid: dx=5mm, dy=5mm, dz=5mm

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/kg = 13.76 dBW/kg

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Date: 2014/11/22

Dipole 2600 MHz_SN:1005_Head

Communication System: CW; Frequency: 2600 MHz, Duty factor: 1:1

Medium parameters used: f = 2600 MHz; $\sigma = 1.981 \text{ S/m}$; $\epsilon_r = 40.383$; $\rho = 1000 \text{ kg/m}^3$

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) = 24.7 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

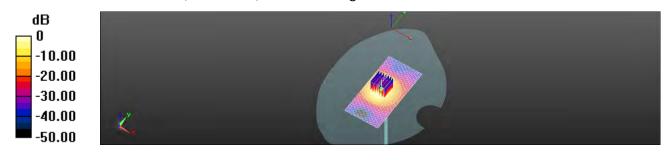
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.68 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 33.6 W/kg

SAR(1 g) = 15.1 W/kg; SAR(10 g) = 6.64 W/kg

Maximum value of SAR (measured) = 23.8 W/kg



0 dB = 24.7 W/kq = 13.93 dBW/kq

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Date: 2014/11/27

Dipole 2600 MHz_SN:1005_Body

Communication System: CW; Frequency: 2600 MHz, Duty factor: 1:1

Medium parameters used: f = 2600 MHz; $\sigma = 2.071 \text{ S/m}$; $\epsilon_r = 52.598$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(7.56, 7.56, 7.56); 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) = 21.5 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

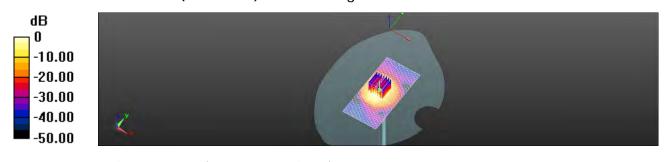
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.05 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 26.2 W/kg

SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.5 W/kg

Maximum value of SAR (measured) = 21.1 W/kg



0 dB = 21.5 W/kq = 13.32 dBW/kq

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Date: 2014/12/08

Dipole 2600 MHz_SN:1005_Head

Communication System: CW; Frequency: 2600 MHz, Duty factor: 1:1

Medium parameters used: f = 2600 MHz; $\sigma = 1.961 \text{ S/m}$; $\epsilon_r = 40.383$; $\rho = 1000 \text{ kg/m}^3$

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) = 24.7 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

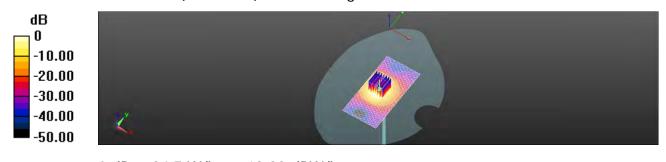
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.32 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 33.6 W/kg

SAR(1 g) = 15.0 W/kg; SAR(10 g) = 6.61 W/kg

Maximum value of SAR (measured) = 23.8 W/kg



0 dB = 24.7 W/kg = 13.93 dBW/kg

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Date: 2014/12/08

Dipole 2600 MHz_SN:1005_Body

Communication System: CW; Frequency: 2600 MHz, Duty factor: 1:1

Medium parameters used: f = 2600 MHz; $\sigma = 2.071 \text{ S/m}$; $\epsilon_r = 52.598$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3923; ConvF(7.56, 7.56, 7.56); 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) = 21.5 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement

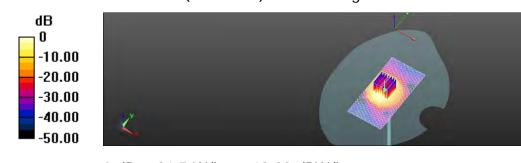
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.851 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 26.2 W/kg

SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.4 W/kg

Maximum value of SAR (measured) = 21.1 W/kg



0 dB = 21.5 W/kg = 13.32 dBW/kg

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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

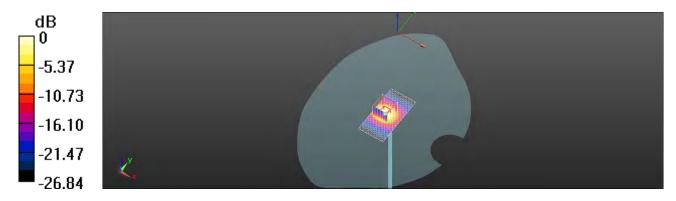
grid: dx=4mm, dy=4mm, dz=2mm

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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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

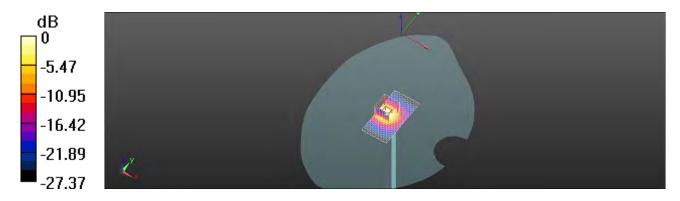
grid: dx=4mm, dy=4mm, dz=2mm

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/kg = 12.82 dBW/kg

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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

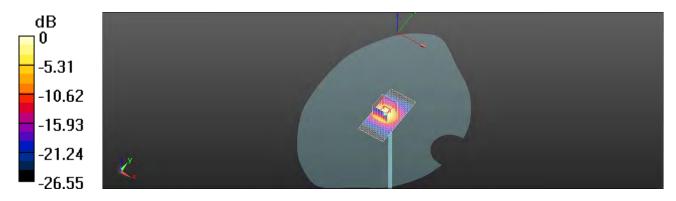
grid: dx=4mm, dy=4mm, dz=2mm

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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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

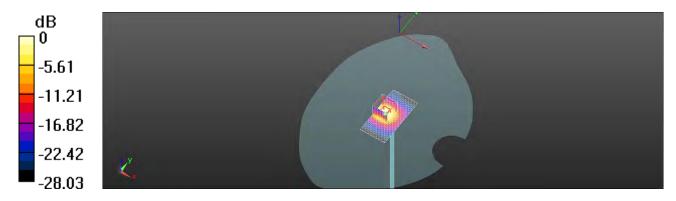
grid: dx=4mm, dy=4mm, dz=2mm

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/kg = 12.17 dBW/kg

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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

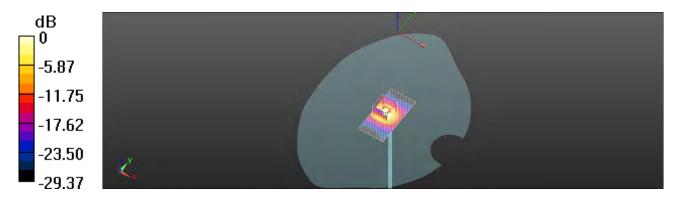
grid: dx=4mm, dy=4mm, dz=2mm

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/kg = 12.93 dBW/kg

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Page: 169 of 268

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

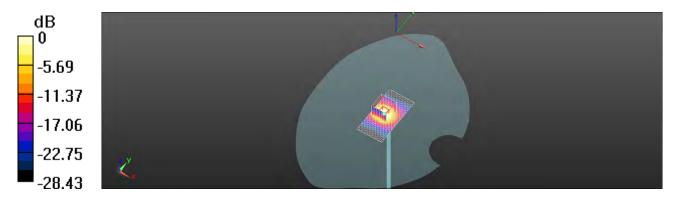
grid: dx=4mm, dy=4mm, dz=2mm

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/kg = 12.59 dBW/kg

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Report No.: EN/2014/B0011 Page: 170 of 268

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

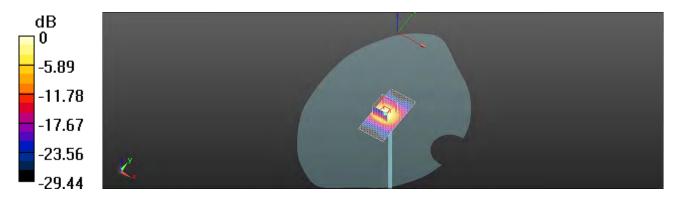
grid: dx=4mm, dy=4mm, dz=2mm

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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Report No.: EN/2014/B0011 Page: 171 of 268

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

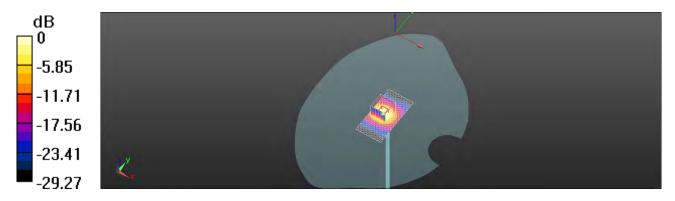
grid: dx=4mm, dy=4mm, dz=2mm

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/kg = 12.28 dBW/kg

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7. DAE & Probe Calibration Certificate

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Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multillateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

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) Cathration date: August 26, 2014 This calibration coefficiate occurrents the paceatelys to readons 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 Doi-14 SN 0810278 01-Del-13 (No:13076) Kathley Multimater Type 2001 Dheck Date (in house) Scheduled Check SE UWS 053 AA 1001 U7-Jan-14 (in house check) Auto DAE Californiann Unit in house check JanvitS SE LIMS 000 AA 1002 07-Jan-14 (in house check) In bouse check: Jan-15 Califivator Box V2.1 Furnition Calibrated by Dominique Statten Approved by: Fin Edmhob Deputy Fechnical Manag Issued: August 26, 2014 This calibration certificate shall not be reproduced except in full without wotten approval of the laboratory.

Page 9 at 5

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Certificate No: DAE4-1260, Aug14

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Accreditation No.: SCS 108

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: Callbration 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 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 modes.

Dortdinate No: DAS4-1250, Aug 14

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DC Voltage Measurement

A/D Convener Resolution nominal

High Renge ILSB = 6.1µV, full range = -100, +600 mV Low Range: ILSB = 61nV, full range = -1,.....+2mV DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec.

Calibration Factors	X	Y	2
High Range	406.033 ± 0.02% (k=2)	405.001 ± 0.02% (k=2)	409.579 ± 0.025 (k-2)
Low Range	3.95663 ± 1.50% (k=2)	4.01886 ± 1.50% (k=2)	4.00468 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	84.0 * ± 1 "

Certificate No. DAE4-1260_Aug14

Page Balls

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Appendix (Additional assessments outside the scope of SCS108)

1. DC Voltage Linearity

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	D.DO-
Channel Y - Input	-20000.52	0.34	-0.00
Channel Z + Input	199998,52	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 K - Input	-198.19	0:50	-0.25
Channel Y + Input	1999.92	-1.02	0.05
Channel Y + input	201,16	-0.29	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

DASY measurement paramolers: 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	1.17	-0,56
	- 200	1.57	-0.48
Channel Y	200	12.66	12,97
	200	13.46	-12.07
Channel Z	200	+0.46	-0.74
	- 200	-1.78	-1.53

3. Channel separation

DASY measurement parameters. Auto Zero Time: 5 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200		5,89	A224
Channel Y	200	9,64		7.42
Channel Z	200	9,68	7.16	

Certificate No. DAE4-1260, Aug 14

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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 Zerc Time: 3 suo; Measuring firms: 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
Channal Z	200	500

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)	
Supply (+ Vec)	-7.9	
Supply (+ Vcc)	:7.6	

9. Power Consumption (Typical values (or information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (* Vcc)	+0.01	+6	+14
Supply (- Vco)	-0.01	48	-8

Certificate No DAE4-1260 Aug 14

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Accreditation No.: SCS 108

Certificate No: DAE4-915_Jun14

CALIBRATION CERTIFICATE DAE4 - SD 000 D04 BK - SN 915 Calibration procedure(e) QA CAL-06.v26 Calibration procedure for the data acquisition electronics (DAE) Calibration date: June 18, 2014 This calibration conflicute documents the Inspecially to national standards, which residue the physical units of messagements (Si). The measurements and the uncommitted with confidence procedulity are given on the blowing pages and are part of the confidence. Micalibrations have been conducted in the closed laboratory facility: enuronment compensions (22 ± 31 C and humiday < 70%). Callimiture Equipmen used (M&TE critical for calbration) Primary Standards Car Date (Certificate No.) Scredued Calibration Keithley Multimoter Type 2001 SN: 0810278 01-Out-13 (Nu:13076) Qt+14 Check Date (in house) Schooland Check Auto DAE Galbration Line SE UWS 050 AA 1001 07-Jan-14 lin house check in house chuck: Jury 15 Calibrator Box V2.1 SE UMS 006 AA 1000 - 07-Jan-14 IIII ris-ue atueki hi house check: Jen-16 Hame Function Calbrated by: Dominique Staffer Technician Approved by Debuty Technical Manager Issued June 18, 2014 This cultimition conflicte shall not be reproduced except or sall without written applicable free laborators

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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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No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803/新北市五股區新北產業園區五工路 134 號 t (886-2) 2299-3279



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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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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

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	

Certificate No: DAE4-915_Jun14

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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 10MΩ

	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 Level (VDC) +7.9	
Supply (+ Vcc)		
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	-8	-9

Certificate No: DAE4-915_Jun14

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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client SGS - TW (Auden)

Certificate No: DAE4-856_Aug14

Accreditation No.: SCS 108

CALIBRATION CERTIFICATE

DAE4 - SD 000 D04 BM - SN: 856

Califration procedure(s) QA CAL-06,v26

Calibration procedure for the data acquisition electronics (DAE)

Calibration date: August 27, 2014

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (51).

The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate,

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

Calibration Equipment used (M&TE ontical for calibration)

r remark desiration	That IV	Distribute (Destributions (40.)	obligation natinidation
Keilhley Multimeter Type 2001	SN: 0810278	01-Oct-13 (No:13976)	Oct-14
Secondary Standards	10 4	Check Date (in flouse)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	07-Jan-14 (in house check)	In house chedic Jan-15
Calibrator Box V2.1	SE UMS 006 AA 1002	07-Jan-14 (in house check)	In house check: Jan-15

Calibrated by

Dominique St

Function

Deputy Technical Manager

Approved by:

Fin Bamhall

Issued August 27, 2014

This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: DAE4-856_Aug14

Page 1 of 5

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Calibration Laboratory of Schmid & Partner Engineering AG





Schweizerischer Kalibriordienst S Service suisse d'étalonnage C Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (GAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary

data acquisition electronics DAE

information used in DASY system to align probe sensor X to the robot Connector angle

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 +1.0% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this
 - 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: DAE4-856_Aug 14

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DC Voltage Measurement

A/D - Converter Resolution nominal

full range = -100: _+300 mV full range = -1 ___+3mV High Range: ILSB = 6.JuV. Low Range: tLSB = 6thV. DASY measurement parameters. Auto Zero Time: 3 sec. Measuring time: 3 sec.

Calibration Factors	X	Ψ.	Z
High Range	403.468 ± 0.02% (k=2)	404.581 ± 0.02% (k=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 °

Certificate No. DAE4-856_Aug14

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Appendix (Additional assessments outside the scope of SCS108)

1. DC Voltage Linearity

High Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	199998,33	0,64	0,00
Channel X + Input	19998,90	-2.25	-D.01
Channel X - Input	-20000.45	0.34	-0.00
Channel Y + Input	199998.95	0.96	0.00
Channel Y + Input	19997.51	-3.82	-0.02
Channel 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 Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	2001 05	-0.09	-0,00
Channel X + Input	202.34	0,80	0.40
Channel X - Input	-198,21	0.26	-0.13
Channel Y + Input	2001 39	0.26	0.01
Channel Y + Input	201.08	-0.36	-0.16
Channel Y - Input	-199.24	-0.78	0.39
Channel Z + Input	2000.92	0.18	-0.01
Channel Z + Input	200.26	-1.22	-0,60
Channel Z - Input	:199.91	-1.47	0.74

2. Common mode sensitivity

	Common mode 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	200	-2.17	2.25
	- 200	0.36	0.61
Channel Z	200	10.27	10.05
	- 200	-13.06	-13.03

3. Channel separation

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200		2.81	-1.15
Channel V	200	7.93	-	3.07
Channel Z	200	8.55	5.24	

Certificate No: DAE4-856_Aug14

Page 4 of 5

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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	16226	16620
Channel Y	15942	16803
Channel Z	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	1,69	0.38
Channel Y	-0.24	-1.57	1,49	0.42
Channel Z	-0.98	-2.01	0.07	0.40

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 Level (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	-8	-9	

Certificate No: DAE4-856_Aug14

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Citure

SGS-TW (Auden)

Accreditation No.: SCS 108

Certificate No: EX3-3923_Aug 14

CALIBRATION CERTIFICATE

Object

EX3DV4-SN:3923

Califration procedure(s)

QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for doximetric E-field probes

Calibration date

August 28, 2014

The columnium conflicate documents me baceability to national standards, which realize the physical under ill measurements (Si). The manuscriments and the uncertainties with confidence propositify are given on the following pages and are part of the confidence

All calibrations have been conducted in the closed latoratory facility, environment temperature (22 ± 3)°G and famility < 10%.

Calibration Equations used IM&TE critical for calibration)

Primary Standards	ID.	Cat Date (Certificate No.)	Scheduled Calibration
Power minter E44198	G841293874	03-Apr-14 (No. 217-01811)	Apr-15
Power senior E4412A	MY41498087	03-Apr 14 (No. 217-01911)	April 5
Reference 3 dft Attenuator	SN: 55054 (3u)	03-Apr-14 (No. 217-01915)	Apr.15
Reference 28 de Attenuator	SN: 85277 (20x)	103-Apr-14 (No. 217-01910)	Apr-15
Reference 30 dB Attenuelor	SN S5129 (30b)	II3-Apr-14 (No. 217-01920)	April 15
Reference Probe E83DV2	SN: 3013	30-Dec-13 (No. ESS-3013 Dec13)	Dep-14
DAE4	SN, 660	13-Dec-13 (No. DAE4-650_Dec13)	Dec.14
Secondary Standards	10	Check Date (in house)	Scheduled Chick
RF generator HP 8648C	LIS3642U01700	4-Aug-98 (in house check Acr-13)	in house check. Apr-16
Network Ababzer HP 8753E	U837390585	15-Oct-01 (in house check Oct-13)	Its house check: Oct-14

Calibrated by:

Certificate No. EX3-3923, Aug 14

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Calibration Laboratory of

Schmid & Partner Engineering AG





Schweizenscher Kallbriedlierest Service suisse d'étaionneg C Servicio sylzzero di taratura Swiss Calibration Service

Acceptimise No.: SCS 108

Ascredimity (in Swin, Accomplision Service (SAS)

The Swiss Accreditation Service is one of the signatories to the Elli Multiluseral Agreement for the recognition of calibration certificates

Glossary:

tissue simulating liquid TSI. NORMK.y.z sensitivity in free space sensitivity in TSL / NORMx,y,z diode compression point CONVE

CF crest factor (1/duty_cycle) of the RF signal A.B.C.D modulation dependent linearization parameters

Polarization in a rotation around probe axis

a region around an axis that is in the plane normal to probe axis (at measurement contin), Polarization it

i.e., it = 0 is normal to proop axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Pools 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 Assorption Rate (SAR) for fund-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:

- NORMs, y.z. Assessed for E-field polarization 8 = 0 (f = 100 MHz in TEM-mill; f > 1800 MHz; R22 waveguide) NORMx, y,z are only intermediate values, i.e., the uncorrainties of NORMx, y,z does not affect the E2-field incertainty inside TSL (see below ConVF)
- NORM(f)x,y,z = NCRMx,y,z * frequency_response (see Frequency Response Charl). This linearization ∈ implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response a included in the stated uncertainty of ConvF.
- DCPx.y.z: CCP are numerical linearization parameters assessed based on the data of power awarp 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
- Ax, y.z. Ex, y.z. Cx, y.z. Dx, y.z. VRx, y.z. A. B. C. D ani numerical linearization parameters assessed based on the data of power sweets 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 t < 900 MHz) and inside waveguide 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 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 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.
- Spherical isotropy (3D deviation from isotropy); it 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 probable (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gamed by determining the NORMx (no. uncertainty required).

Fernican No. EXS-J923 Aug 14

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EX 10V4 - SVLTVE

7800006-20 -501to

Probe EX3DV4

SN:3923

Manufactured; Calibrated:

March 8, 2013 August 28, 2014

Calibrated for DASY/EASY Systems (Nois: non-compatible will DASY2 system)

Cortificate No: EX3-3923_Aug14

Page 2 of TT

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EX3DV4-5N 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	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	C	dB	WR mV	Unc (k=Z)
O-	CW	X	0.0	0.0	1.0	0.00	132.9	23.0 %
		Y	0.0	-0.0	1.0		134 B	_
		2	0.0	0.0	1.0		135 (0	

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_August

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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 of the community to community and the rest of the



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August 20, 2014 EX00V4 SN:3923

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3923

Calibration Parameter Determined in Head Tissue Simulating Media

r (MHz) [©]	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF V	ConvF Z	Alphé 9	Depth ^G (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	± 12.0 %
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	±12.0%
2450	39.2	1.80	7.66	7,66	7,66	0.33	0.87	112.0%
2600	39.0	1.96	7.41	7.41	7.41	0.35	0.86	±12.0%
5200	36.0	4.68	5.17	5.17	5.17	0.35	1.80	± 13.1 9
5300	35.9	4.76	4.99	4.99	4.99	0.35	1,80	±13.1.9
SECKT	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 %

⁶ 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.

Cerminate Nr. EX3-3923_Aug 14

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An requestion comes a Care. We writely a few a Sight, be validly of tissue parameters (clarified in a fair control of the properties a few a appear or measured SAV values. At languages above a few a specific of the Confirmation of the control of the second of the seco



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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 0 (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	7.56	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	a 13.1 %
5300	48,9	5.42	4.58	4,58	4.58	0.35	1.90	± 13.1 %
5600	48.5	5.77	4.09	4.09	4:09	-0.4D	1.00	±13.13
5800	48.2	6.00	4.33	4,33	4:33	0.40	1.90	2 13.1 3

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. In and or its restricted to ± 5%. The uncertainty of the 150 of the Count and other parameters.

Applied out are delationated earger tissue parameters.

Applied out to the boundary effect offer outperforms below ± 2% for higher costs between 3-8 GHz at any delation larger than full this price to

Certificate No. EX3-3923_Aug 14

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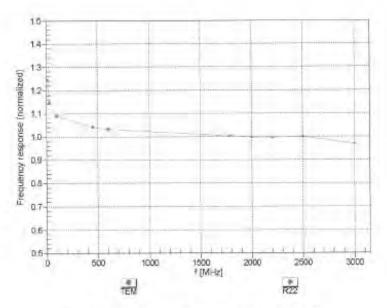
Page: 193 of 268

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

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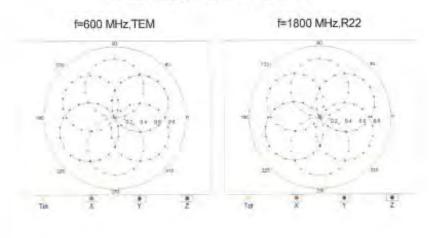
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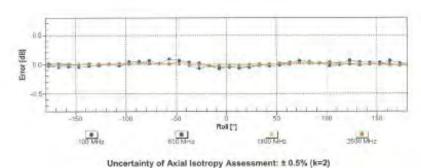


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EX3DV4- SN:3923 August 28, 2014

Receiving Pattern (\$), 9 = 0°





Gertificate No: EX3-3923_Aug14

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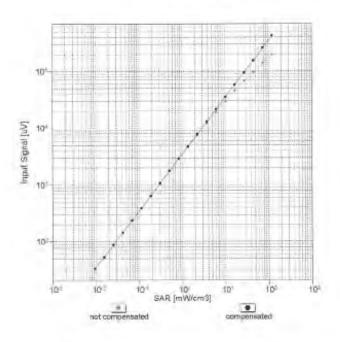
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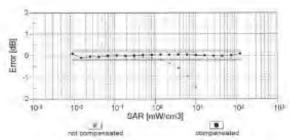


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EX3DV4- SN:3923 August 28; 2014

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





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

Certificate No: EX3-3923_Aug14

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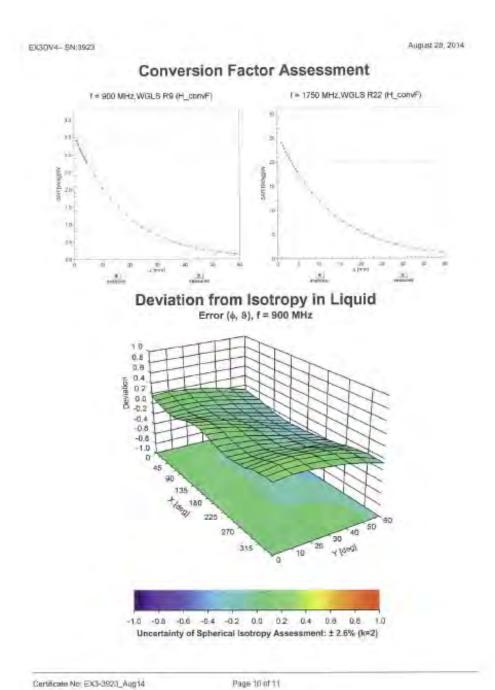
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EXXXV4 SN:3323

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 Dejection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 cmm
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 Messurement Distance from Surface	1.4 rem

Certificate No. EX3-3925_Aug 14

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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerlscher Kalibrierdienst Service auisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client SGS-TW (Auden)

Accreditation No.: SCS 108

Certificate No: EX3-3831_Jan14

CALIBRATION CERTIFICATE

Object EX3DV4 - SN;3831

Calibration procedure;

QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: January 31, 2014

This calibration contincate documents like 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 taboratory facility: environment temperature (22 ± 8)*C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E44198	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuation	SN S5054 (3c)	D4-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	D4-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013, Dec13)	Dec-14
DAE4	SN. 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ip	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US373905B5	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

Name Function Signature
Latiscratory Technician Signature
Latiscratory Technician Signature
Latiscratory Technician Signature
Retja Pokovic Technicial Manage

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Calibration Laboratory of

Schmid & Partner Engineering AG sstrasse 43, 8004 Zurich, Switzerland





С

Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

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 ConvF DCP diode compression point

crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters A. B. C. D

Polarization o 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., 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

 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 \$ = 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 E²-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 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
- 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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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

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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) ²) ^A	0.45	0.42	0.43	± 10.1 %
DCP (mV) ^B	102.4	100.1	97.7	

Modulation Calibration Parameters

UID	Communication System Name		Α	В	С	D	VR	Unc
			dB	dB√μV		dB	mV	(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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^a The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^a Numerical linearization parameter: uncertainty not required.

^b Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the



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EX3DV4- SN:3831

January 31, 2014

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

Calibration Parameter Determined in Head Tissue Simulating Media

indiation Farameter Determined in Head 11ssue Simulating Media											
f (MHz) ^C	Relative Permittivity F	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ⁶	Depth ^G (mm)	Unct. (k≃2)			
750	41.9	0.89	9.59	9.59	9.59	0.74	0.64	± 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 %			

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^C Frequency validity 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.

At frequencies below 3 GHz, the validity of tissue parameters (s and e) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. Aft requencies 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 tissue parameters.

Apha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance targer than half the probe tip diameter from the boundary.



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EX3DV4-- SN:3831

January 31, 2014

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) C	Relative Permittivity F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha ⁶	Depth ^G (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 %

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At frequencies below 3 GHz, the validity of tissue parameters (c and c) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. Afterguencies above 3 GHz, the validity of tissue parameters c and o) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



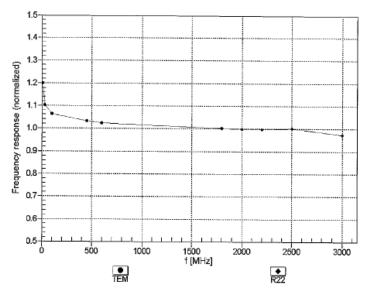
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January 31, 2014

Frequency Response of E-Field

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



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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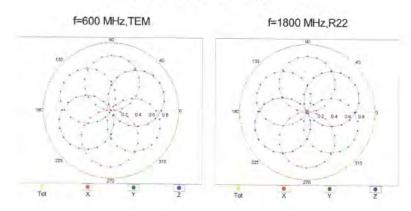


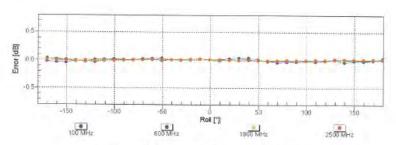
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January 31, 2014

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





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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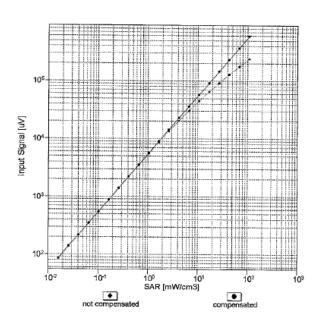


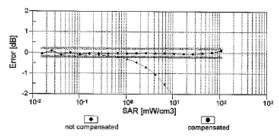
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January 31, 2014

Dynamic Range f(SAR_{head}) (TEM cell, f = 900 MHz)





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

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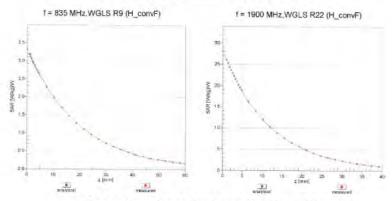


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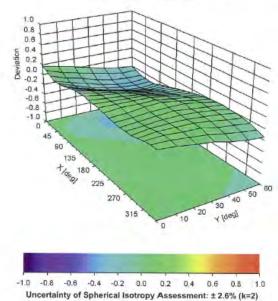
January 31, 2014

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (6, 9), f = 900 MHz



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EX3DV4-SN: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

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SGS-TW (Auden)

Cerellicate No. EX3-3770 April4

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 we 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 = 70%. Calibration Equipment used IMATE critical for calibration)

Printing Standards	(b)	(Call Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	E3-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 cB Attenuation	SN: 36054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 db Atlemator	SN: 86277 (204)	03-Apr-14 (No. 217-01619)	April 15
Falterence 30 cB Abenuator	SN: 55129 (30b)	(CS-Apri-14 (No. 217-01920)	April 15
Reterence Probe E330V2	EN: 3013	30-Den-13 (No. ES3-3013_Dec13)	Dec-14
DAEI	SN 680	13 Dec-13 (No. DAE4 662 Dec13)	Dec-14
Secondary Standards	(13)	Check Date (in house)	Scheduled Check
RF generator HP 8848C	US3842U01700	4-Aug-99 (in house check Apr-13).	tri floyaercheck: Apr-15
Network Analyzes HP 8753E	US37990560	18-Oct-01 (in house check Col-13)	in house check: Oct-14

Norme	Function	Signiture _
Jeich Kastrali	Laborary Technologic	FILE
Katja Polimic	Technical Manager	JERKY.
		Issued, April 24, 2014
	Jenon Kastrali	Jeton Kastrati Jaba seary Technogau

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Calibration Laboratory of

Schmid & Partner Engineering AG eughausstrasse 43, 8904 Zurich, Switzerland





Schweizerischer Kalibrierdie Service suisse d'étalor С Servizio svizzero di taratura viss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signat 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 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 E²-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 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).

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No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803/新北市五股區新北產業園區五工路 134 號

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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!)

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April 24, 2014 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) ²) ^A	0.31	0.61	0.40	± 10.1 %
DCP (mV) th	104.0	96.9	102.5	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc ^{ll} (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%.

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^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 6 and 6).

^a Numerical linearization parameter: uncertainty not required.

^a Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



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EX3DV4-SN:3770

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

Calibration Parameter Determined in Head Tissue Simulating Media

ilbration Parameter Determined in Head 1188de Simulating Media											
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ⁶	Depth ⁶ (mm)	Unet. (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 %			

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Frequency validity of a 100 MHz only applies for DASY w.A. 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 lissue parameters (a and o) can be relaxed 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 for indicated trappt fissue 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 and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



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EX3DV4- SN:3770

April 24, 2014

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ⁰	Depth ⁶ (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 %
5600	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 %

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⁶ 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.

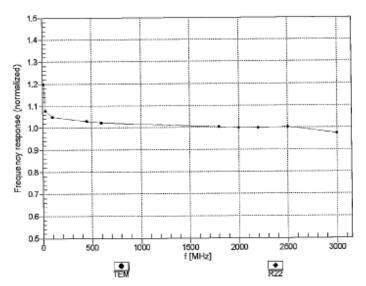
ApharDepth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-8 GHz at any distance larger than half the probe tip diameter from the boundary.



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



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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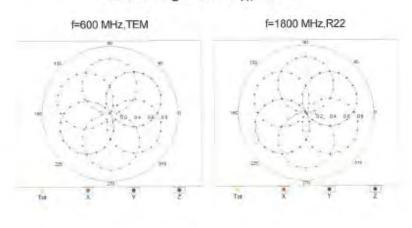
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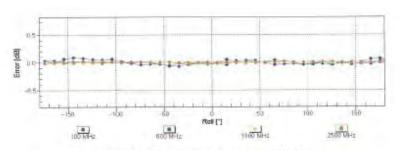


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Receiving Pattern (\$\phi\$), 9 = 0°





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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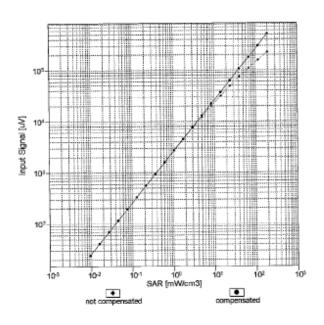


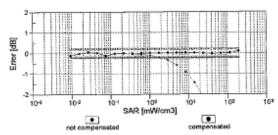
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Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)





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

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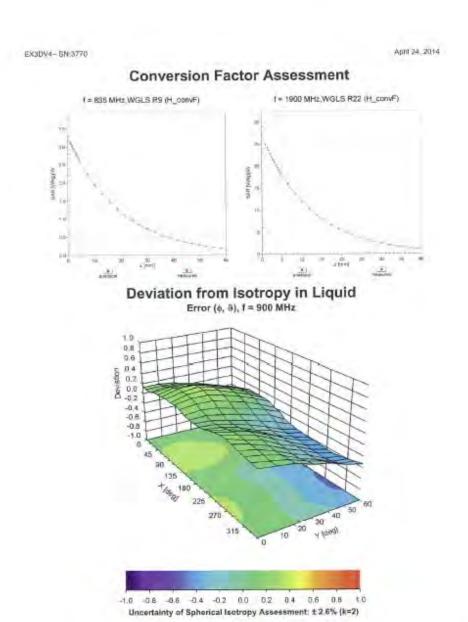
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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (*)	-34.3
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

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8. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test

IEEE 1528

<u>IEEE 1528</u> A	c	D	e	f	g	h=c * f / e	i=c * g / e	k
A	Tolerance/	ע	е	1	g	n=c * 17 e	1=C + g / e	K
Source of Uncertainty	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	√3	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1	1	5.54%	5.54%	∞
Boundary Effect	1.00%	R	√3	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	$\sqrt{3}$	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	$\sqrt{3}$	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	$\sqrt{3}$	1	1	0.46%		
Integration Time	2.60%	R	$\sqrt{3}$	1	1	1.50%	1.50%	∞
Measurement drift	1.75%	R	$\sqrt{3}$	1	1	1.01%	1.01%	∞
(class A evaluation)	1.7570	K	v 3			1.01 /6	1.0170	
RF ambient condition - noise	3.00%	R	$\sqrt{3}$	1	1	1.73%	1.73%	∞
RF ambient conditions reflections	3.00%	R	$\sqrt{3}$	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√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%	∞
Phantom and Setup								
Phantom Uncertainty	4.00%	R	√3	1	1	2.31%	2.31%	∞
Liquid conductivity(meas.)	4.98%	N	1	0.64	0.43			
Liquid permitivity(meas.)	4.80%	N	1	0.6	0.49	2.88%	2.35%	M
Combined standard uncertainty		RSS				12.34%	12.00%	
Expant uncertainty (95% confidence interval), K=2						24.68%	24.00%	

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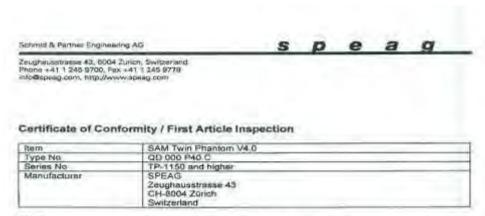
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9. Phantom Description



The series production process used allows the limitation to test of first articles.

Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ft.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz - 6 GHz: Relative permittivity < 5, Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating fiquids	Pre-series, First article, Material samples
Sagging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid.	< 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below	Prototypes, Sample testing

Standards

- CENELEC EN 5036 | IEEE Std 1528-2003 IEC 62209 Part I

- FCC DET Bulletin 65, Supplement C, Edition 01-01
 The IT IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

07 07 2005

Signature / Stamp

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10. System Validation from Original Equipment Supplier



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Calibration Laboratory of Schmid & Partner Engineering AG Zoughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kallimieritiers Beryled suissa d'étalonnage C Servicin evizoro di teratura **Swing Calibration Service**

ecomion No. 5CS 108

edual by the Swine Appleciation Service (BAS)

The Swiss Appreditation Service is one of the signatories to the EA Mulfishe at Agreement for the recognition of calibration cartificates

Glossary:

TSL ConvE

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%

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Measurement Conditions

DASY 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

The 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 ³ (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

The following 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 ³ (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 ³ (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)

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Appendix (Additional assessments outside the scope of SCS108)

Antenna Parameters with Head TSL

Impedance: transformed to fined point	51,7 \Omega - 3,6 \Omega\)	
Return Loss.	-28.2 d∄	

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.1 II - II B II
Ration Loss	-29.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	Tule Trus	
----------------------------------	-----------	--

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 is directly connected to the ascend 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 cipoid 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	

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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; σ = 0.94 S/m; ε_r = 42; ρ = 1000 kg/m³
Phantom section; Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

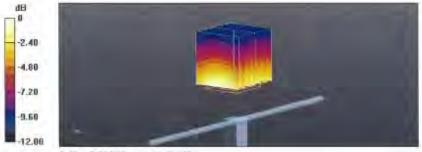
DASY52 Configuration:

- 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/kgMaximum value of SAR (measured) = 2.78 W/kg



0 dB = 2.78 W/kg = 4.44 dBW/kg

Certificate No: D835V2-4c083_Aug14

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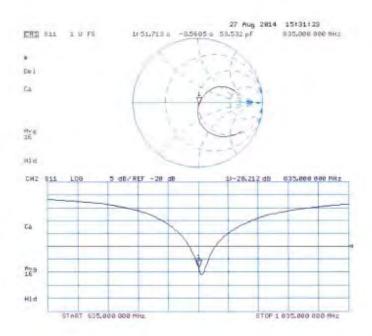
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Impedance Measurement Plot for Head TSL



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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)
- 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 = 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 dBW/kg

Certificate No: D835V2-4d063 Aug 14

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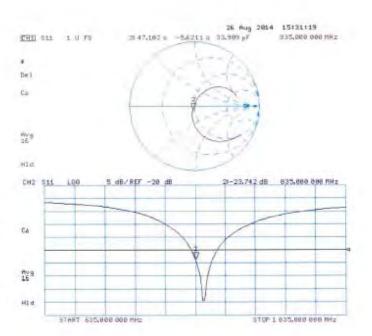
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Impedance Measurement Plot for Body TSL



Certificate No: D835V2-4d063_Aug14

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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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Client SGS-TW (Auden)

Accreditation No.: SCS 108

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Certificate No: D1900V2-5d027 Apr14

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Certificate No: D1900V2-5d027_April-4

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Glossary:

TSL ConvF 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)", 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%.

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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

	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 ³ (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 cm3 (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 ³ (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 cm ³ (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)

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$52.5 \Omega + 6.8 J\Omega$
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

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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; $\sigma = 1.36$ S/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

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/kgMaximum value of SAR (measured) = 12.3 W/kg



0 dB = 12,3 W/kg = 10.90 dBW/kg

Certificate No: D1900V2-5d027_Apr14

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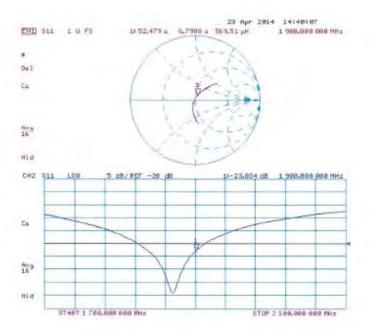
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Impedance Measurement Plot for Head TSL



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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; $\sigma = 1.52 \text{ S/m}$; $\epsilon_r = 52.4$; $\rho = 1000 \text{ kg/m}^2$

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/kgMaximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

Certificate No: D1900V2-5d027_Apr14

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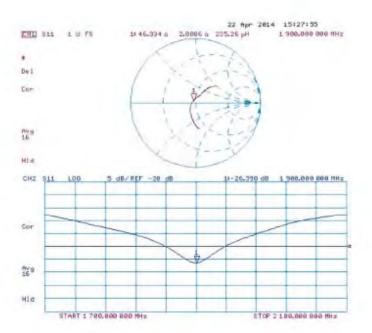
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Impedance Measurement Plot for Body TSL



Certificate No: D1900V2-5d027_Apr14

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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kallbrierdienst 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

	ERTIFICATE		
Otted	D2450V2 - SN: 7	27	
Calibration proceduralis)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date:	April 23, 2014		
The measurements and the unco	mainties with confidence p	onal standants, which réalize the cryescal un robability are given on the following pages an ly facility coversement temperature (22 ± 3)*(is are part of the certificate.
Pemary Standards	10 4	Cal Date (Centricate No.)	Scheduled Contration
Power merer EPM-442A	GB37480704 US37292783	09-Dcs-13 (No. 217-01627)	Del-14
Power sensor HP 648TA Power sensor HP-848TA Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES30V3 DAE4	MV410R317 SN: 506E (20k) SN: 5047.2 / 06327 SN: 5205 SR: 624	09-Oct-13 (No. 217-01887) 09-Oct-13 (No. 217-01886) 03-Apr. 14 (No. 217-01988) 03-Apr. 14 (No. 217-01987) 30-Dec-13 (No. ES3-3205_Dec13) 25-Apr. 15 (No. DAE4-861_Apr.13)	DG114 DG1-14 Apr-15 Apr-15 Dbc-14 Apr-14
Power sensor HP 6481A Power sensor HP 6481A Reference 20 dB Attenuator Type-N mamaich combination Reference Probe ESSOV3	MV41082317 SN: 506B (20k) SN: 5047.2 / 06327 SN: 3205	08-061-13 (No. 217-01828) 03-April 4 (No. 217-01918) 03-April 4 (No. 217-01921) 36-Dec-13 (No. ES3-3205_Dec18)	Doi-14 Apr-15 Apr-15 Dec-14
Power sensor HP 6481A Power sensor HP 8481A Refeence 20 dB Attenuator Type-N mismatch combination Reference Probe ESSDV3 DAE4	MV41092317 SN: 5068 (20k) SN: 5047.2 / 06327 SN: 3205 SR: 604	09-0c1-13 (No. 217-01826) 03-Apr; 14 (No. 217-01918) 03-Apr; 14 (No. 217-01921) 30-Dec-13 (No. ES3-3205, Dec13) 25-Apr; 15 (No. DAE4-861, Apr; 13)	Dct-14 Apr-15 Apr-15 Doc-14 Apr-14 Schodulad Chack In house drace Od-16
Power sensor HP 6481A Power sensor HP 6481A Power sensor HP 6481A Reference 20 dB Abenualor Type-N mannaich combination Type-N mannaich combination Twiceence Probe ESSOV3 DAE4 Secondary Standards RF genmaior P&S SMT-06	MY4108317 SN: 506E (20k) SN: 5047-2 / 08327 SN: 5305 SR: 921	08-0c1-13 (No. 217-01826) 03-Apr 14 (No. 217-01918) 03-Apr 14 (No. 217-01921) 30-Dec-13 (No. ES3-3205, Dec13) 25-Apr 15 (No. DAE4-661, Apr 13) Check Date (in flouse) D4-Aug-25 (in house check Dd-13)	Doi-14 Apr-15 Apr-15 Doi-14 Apr-14
Power sensor HP 6481A Power sensor HP 6481A Power sensor HP 6481A Reference 20 dB Abenuator Type-N mannach combination Type-N mannach combination DAE4 Secondary Standards RF generator P&S SMT-06 Nathorik Analyzer HP 5753E	MY4108317 SN: 506E (20k) SN: 5047.2 / 08327 SN: 3205 SR: 601 10 V 100015 US37380585 54206 Name	09-Oct-13 (No. 217-01826) 03-Apr; 14 (No. 217-01918) 03-Apr; 14 (No. 217-01921) 30-Doc+13 (No. ES3-3205_Dect3) 25-Apr; 15 (No. DAE4-861_Apr; 13) Oneck Date (in titude) 04-Aug = 6 (in house check Dct-13) 18-Oct-01 (in house check Dct-13)	Dct-14 Apr-15 Acr-15 Dec-14 Apr-14 Scheduled Check In house dreps: Dct-16 In house check: Oct-14

Certificate No: D2450V2-727_Apr14

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Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL ConvE

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)*, February 2005
- 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

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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	
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 ³ (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 ² (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

The following 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 ³ (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 ³ (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)

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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

1		
1	Electrical Delay (one direction)	1.148 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	January 09, 2003

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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/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

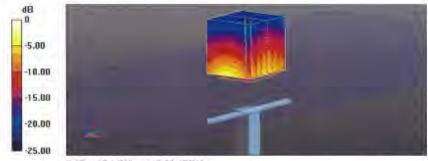
- Probe: ES3DV3 SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04,2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52,8.7(1137); SEMCAD X 14,6.10(7164)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid; dx=5mm, dy=5mm, dz=5min 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

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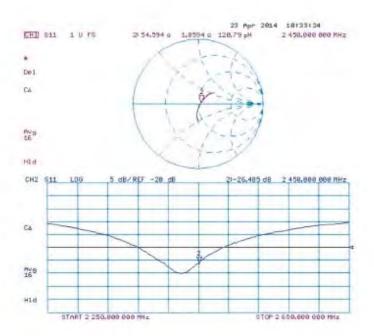
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Impedance Measurement Plot for Head TSL



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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; $\sigma = 2.01 \text{ S/m}$; $\epsilon_r = 50.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205: ConvF(4.35, 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

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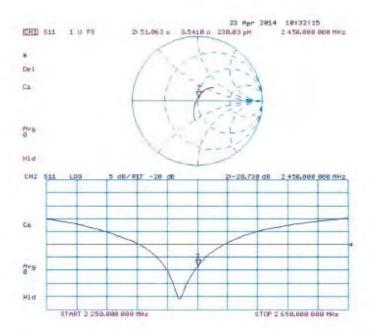
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Impedance Measurement Plot for Body TSL



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No. SCS 108

ALIDINATION	ERTIFICATE		
Object:	D2600V2 - SN: 10	005	
Calibration procedure(s)	QA CAL-05.v9 Calibration process	dure for dipole validation kits abo	ve 700 MHz
Carbiation date.	January 28, 2014		
The measurements and the unce	etainties with confidence p	onal standards, which realize the physical un notability are given on the following pages an ny facility: environment temperature (22 ± 3)*	o are purt of the certificata.
All confes and the today policy on one	oton in the citizen and and	y many emissions in person for 2 of	2.010 (10.000) 2.7 0.7
Calibration Equipment used (MS	TE critical for calibration)		
	TE critical for caribration)	Cai Date (Cartificate No.)	Scheduled Calibration
Primary Standards		Cer Date (Certificate No.), 89-Oct-13 (No. 217-01827)	Stireduled Calibration Oct-14
Primary Standards Power mater EPM-442A	10 +		
Calibration Equipment used IMS Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A	1D # GB37480704	09-Oct-13 (No. 217-D1827)	Oct-14
Primary Standards Power mater EPM-442A Power sensor HP 8481A	ID # GB37480704 US37292783	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736)	Oct-14 Oct-14 Oct-1= Apr-14
Primary Standards Power mater EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dS Affernator Type-N mismetici combonation	ID # GB37480704 US37292783 AY41082317 SN 5058 (20s) SN 5047 3 / 08327	(90-Oct-13 (No. 217-01827) (90-Oct-13 (No. 217-01827) (10-Oct-13 (No. 217-01826) (44-Apr-13 (No. 217-01726) (44-Apr-13 (No. 217-01728)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14
Primary Standards Power meter EPM-442A Power sensor I+P 8481A Power sensor I+P 8481A Reference 20 dB Afferuation Type-N missmetor combon-ellori Reference Probe ESSDV3	ID # GB37480704 US37292783 MY41092317 SN 5068 (20A) SN 5047 3 / 06027 SN: 3205	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 05-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01728) 04-Apr-13 (No. 217-01729) 30-Occ-13 (No. E53-3205, Dec13)	Oct-14 Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Oct-14
Primary Standards Power mater EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dS Affernator Type-N mismetici combonation	ID # GB37480704 US37292783 AY41082317 SN 5058 (20s) SN 5047 3 / 08327	(90-Oct-13 (No. 217-01827) (90-Oct-13 (No. 217-01827) (10-Oct-13 (No. 217-01826) (44-Apr-13 (No. 217-01726) (44-Apr-13 (No. 217-01728)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Alteruator Type-N misimatich combox-ellori Reference Probe ESSDV3 DAE4	ID # GB37480704 US37292783 MY41082317 SN 5088 (20a) SN 5047 3 / 05327 SN 3205 SN 801	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 109-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01726) 04-Apr-13 (No. 217-01728) 30-Dec-13 (No. DAE4-601, Apr13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Doc-14 Apr-14
Primary Standards Power meter EPM-442A Power sensor HP 9481A Power sensor HP 9481A Reference 20 GB Affernation Type-N mismatch roombre-Bron- Reference Probe ES3DV3 DAE4 Secondary Standards	10 = G837480704 US37292793 MY41092917 SN 5058 (20A) SN 5047 3 / 06327 SN: 3205 SN 901	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01726) 04-Apr-13 (No. 217-01728) 30-Dec-13 (No. E53-3205, Dec13) 25-Apr-13 (No. DAE4-801, Apr13) Check Dalla (In house)	Oct-14 Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Oct-14
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Alteruator Type-N misimatich combox-ellori Reference Probe ESSDV3 DAE4	ID # GB37480704 US37292783 MY41082317 SN 5088 (20a) SN 5047 3 / 05327 SN 3205 SN 801	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 109-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01726) 04-Apr-13 (No. 217-01728) 30-Dec-13 (No. DAE4-601, Apr13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Doc-14 Apr-14 Scheduled Check
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 GS Affenuator Reference 20 GS Affenuator Reference Probe ESSDV3 DAE4 Secondary Standards HP ponurator RAS SMT-06	ID # GB37480704 US37292783 MY41092317 SN 5049 (20k) SN 5047 3 795227 SN 5047 3 795227 SN 5047 3 795227 SN 501 ID # 100005	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 019-Oct-13 (No. 217-01829) 04-Apr-13 (No. 217-01729) 30-Dec-13 (No. 217-01729) 30-Dec-13 (No. DAE4-801_Apr13) Check Data (In house) 04-Aug-99 (In house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-14 Apr-14 Schodulid Check In Rouse cireck: Oct-18
Primary Standards Power meter EPM-442A Power sensor H® 9481A Power sensor I® 9481A Reference 20 GB Affenuator Reference 20 GB Affenuator Reference Probe ESSDV3 DAE4 Secondary Standards R® ponurator RAS SMT-06	ID # GB37480704 US37292783 MY41092317 SN 5049 (20k) SN 5047 3 795227 SN 5047 3 795227 SN 5047 3 795227 SN 501 ID # 100005	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 019-Oct-13 (No. 217-01829) 04-Apr-13 (No. 217-01729) 30-Dec-13 (No. 217-01729) 30-Dec-13 (No. DAE4-801_Apr13) Check Data (In house) 04-Aug-99 (In house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-14 Apr-14 Schodulid Check In Rouse cireck: Oct-18
Primary Standards Power meter EPM-442A Power sensor H® 9481A Power sensor I® 9481A Reference 20 GB Affenuator Reference 20 GB Affenuator Reference Probe ESSDV3 DAE4 Secondary Standards R® ponurator RAS SMT-06	10 * GB37480704 US37292793 MY41082917 SN 5058 (20b) SN 5047 3 / 05327 SN: 3207 SN: 901 UD # 199805 US37399565 S4200	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01728) 30-Dec-13 (No. E53-3205, Dec13) 25-Apr-13 (No. DAE4-801, Apr13) Check Dalle (in house) 04-Aug-99 (in house check Cict-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-14 Apr-14 Schoduled Check In flourse check: Oct-16 In house check: Oct-14
Primary Standards Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dis Afferuator Type-N mismatic roombon-shori Reference Probe ES3DV3 DAE4 Secondary Standards RF generator HA'S SMT-05 Network Analyzar HP 8753E Calibrated by	10 = GB37480704 US37292793 MY41082917 SN 5058 (20b) SN 5057 3 7 05327 SN 3205 SN 901 UD # 199005 US37399565 \$4200 Name Chauso = sublin	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01728) 00-Dec-13 (No. E53-3205, Dec13) 25-Apr-13 (No. DAE4-801, Apr13) Check Dalla (In house) 04-Aug-99 (In house check Cct-13) 18-Oct-01 (in house check Oct-13) Function Lisboratory (ecrinicism	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-14 Apr-14 Schoduled Check In flourse check: Oct-16 In house check: Oct-14
Primary Standards Power meter EPM-442A Power sensor HP 9481A Power sensor HP 9481A Reference 20 GB Affenuator Reference 20 GB Affenuator Reference Probe ESSDV3 DAE4 Secondary Standards RF ponurator RAS SMT-06 Network Analyzer HP 8753E	ID # GB37480704 US37292783 MY41082317 SN 5089 (200) SN 5047 8 7 98327 SN 5047 8 7 98327 SN 5001 ID # 100805 US37390585 \$4200 Name	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01829) 04-Apr-13 (No. 217-01726) 04-Apr-13 (No. 217-01728) 04-Apr-13 (No. 217-01728) 30-Dec-13 (No. E53-3205, Dec13) 25-Apr-13 (No. DAE4-801, Apr13) Check Dalla (In house) 04-Aug-99 (In house check Cict-13) 18-Oct-01 (in house check Cict-13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-14 Apr-14 Schoduled Check In flourse check: Oct-16 In house check: Oct-14

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Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificate

Glossary:

TSL

N/A

ConvF

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)", 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%.

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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	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

he following parameters and calculations were applied.

The following parameters and educations were approximately	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 cm3 (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 ³ (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

he following parameters and calculations were applied.

ne rollowing parameters and calculations were appri	eu.		
	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 ³ (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 ³ (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)

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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, 2008

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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; $\sigma = 2.02$ S/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³ Phantom section: Flat Section

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.46, 4.46, 4.46); Calibrated: 30.12.2013;
- · Sensor-Surface: 3mm (Mechanical Surface Detection)

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

- 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 = 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 dB = 19.3 W/kg = 12.86 dBW/kg

Certificate No: D2600V2-1005_Jan14

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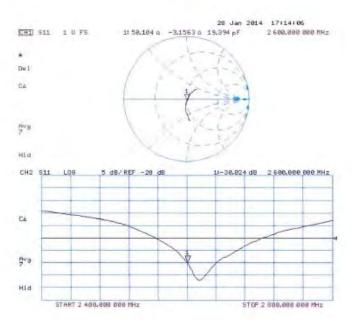
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Impedance Measurement Plot for Head TSL



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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; $\sigma = 2.21 \text{ S/m}$; $\epsilon_r = 50.9$; $\rho = 1000 \text{ kg/m}^3$

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)

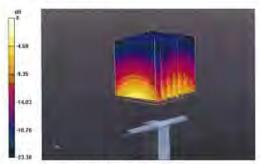
· Electronics: DAE4 Sn601; Calibrated: 25.04.2013

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 = 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



0 dB = 19.3 W/kg = 12.86 dBW/kg

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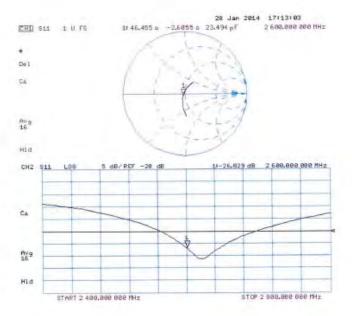
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Impedance Measurement Plot for Body TSL



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Multilateral Agreement for the recognition of salibration certificates

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Calibration date:	April 16, 2014		
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Calibration Laboratory of

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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%.

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Measurement Conditions

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 5600 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

	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 ³ (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 ² (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)

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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 ² (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 cm3 (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 cm ³ (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)

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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 cm3 (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 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.5 W/kg ± 19.5 % (k=2)

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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 ³ (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 ³ (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)

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Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	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 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm ³ (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 ³ (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 ³ (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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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 jΩ
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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General Antenna Parameters and Design

Electrical Delay (one direction)	1,207 ns
Licetical Dollay (one allegatory	11207 110

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

Ma	anufactured by	SPEAG
Ma	anufactured on	September 24, 2010

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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; σ = 4.43 S/m; ϵ_r = 35.8; ρ = 1000 kg/m³, Medium parameters used: f = 5300 MHz; σ = 4.54 S/m; ϵ_r = 35.7; ρ = 1000 kg/m³, Medium parameters used: f = 5600 MHz; σ = 4.83 S/m; ϵ_r = 35.3; ρ = 1000 kg/m³, Medium parameters used: f = 5800 MHz; σ = 5.03 S/m; ϵ_r = 35; ρ = 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

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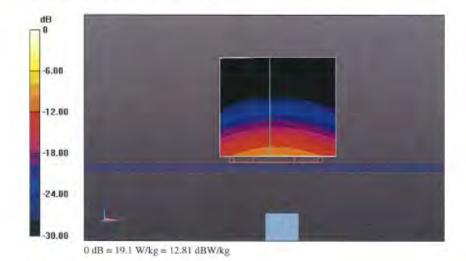
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,

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/kg

Maximum value of SAR (measured) = 19.1 W/kg



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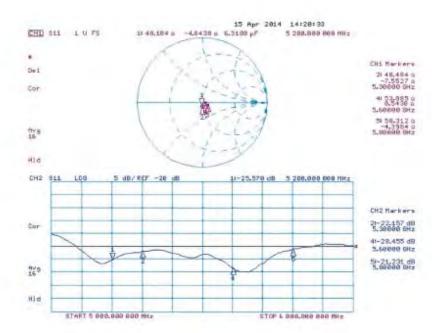
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Impedance Measurement Plot for Head TSL



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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; $\epsilon_r = 47$; $\rho = 1000$ kg/m³, Medium parameters used: f= 5300 MHz; σ = 5.57 S/m; ϵ _c = 46.8; ρ = 1000 kg/m³, Medium parameters used: f = 5600 MHz; σ = 5.96 S/m; ϵ_r = 46.3; ρ = 1000 kg/m³, Medium parameters used: f = 5800 MHz; σ = 6.23 S/m; ϵ_r = 46; ρ = 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

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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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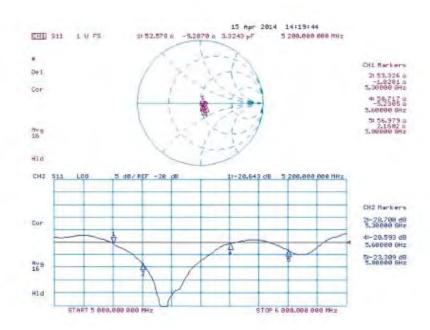
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Impedance Measurement Plot for Body TSL



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