SAR TEST REPORT

Equipment Under Test	Tablet (Pad) Computer
Model	ThinkPad Tablet
Canadian Model number	TP00028AE
Company Name	Compal Electronics, Inc.
Company Address	No.581,Ruiguang.,Neihu District, Taipei City 11492, Taiwan(R.O.C)
FCC KDB inquiry tracking number	271063
Date of Receipt	2011.07.23
Date of Test(s)	2011.07.24~2011.08.04;2011.09.02
Date of Issue	2011.11.02

Standards:

FCC OET 65 supplement C,
IEEE /ANSI C95.1 , C95.3, IEEE 1528,
RSS-102

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

Remarks:

This report details the results of the testing carried out on one sample, 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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Tested by : **Ricky Huang** **Date** : **2011.11.02**
Asst. Supervisor

Approved by : **Nick Hsu** **Date** : **2011.11.02**
Supervisor

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Revision Version

Report Number	Revision	Date	Memo
ES/2011/70014	00	2011/08/09	Initial creation of test report.
ES/2011/70014	01	2011/08/24	1st modification
ES/2011/70014	02	2011/09/06	2nd modification
ES/2011/70014	03	2011/09/07	3rd modification
ES/2011/70014	04	2011/10/04	4th modification
ES/2011/70014	05	2011/10/25	5th modification
ES/2011/70014	06	2011/11/02	6th modification

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

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Contents

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1. General Information

1.1 Testing Laboratory

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Internet	http://www.tw.sgs.com

1.2 Details of Applicant

Name	Compal Electronics, Inc.
Address	No.581,Ruiguang.,Neihu District, Taipei City 11492, Taiwan(R.O.C)
Contact Person	Evelyn_Yang

1.3 Description of EUT

EUT Name	Tablet (Pad) Computer
Model No. of Modular	F5521gw
Model	ThinkPad Tablet
Canadian Model number	TP28000AE
Brand Name	Lenovo
Marketing Name	Tablet Computer
FCC ID	GKR-TP00028AE
IC ID	2533B-TP00028AE
IMEI code	004401700676220

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<table>
<tr><td>Definition</td><td colspan="4">Production unit</td></tr>
<tr><td>Mode of Operation</td><td colspan="4">GSM\GPRS\EGPRS\ WCDMA\HSDPA\HSUPA</td></tr>
<tr><td rowspan="3">Duty Cycle</td><td>GPRS</td><td>EGPRS</td><td colspan="2">WCDMA</td></tr>
<tr><td>1/4 (2 multi-slot)</td><td>1/4 (2 multi-slot)</td><td colspan="2" rowspan="2">1</td></tr>
<tr><td colspan="2">DTM multi class B
(GPRS Mobile station(MS) class B)</td></tr>
<tr><td rowspan="2">TX Frequency range (MHz)</td><td>GPRS 850</td><td>GPRS1900</td><td>WCDMA Band II</td><td>WCDMA Band V</td></tr>
<tr><td>824.2-
848.8</td><td>1850.20
-1909.80</td><td>1852.40
-1907.60</td><td>826.40
-846.60</td></tr>
<tr><td rowspan="2">Channel Number (ARFCN)</td><td>GPRS 850</td><td>GPRS1900</td><td>WCDMA Band II</td><td>WCDMA Band V</td></tr>
<tr><td>128-
251</td><td>512-
810</td><td>9262-
9538</td><td>4132-
4233</td></tr>
<tr><td rowspan="8">Max. SAR Measured (1g) mW/g</td><td colspan="4">GPRS 850</td></tr>
<tr><td colspan="4">0.926
At GPRS 850_ CH128_ Lap-held mode _(2 multi-slot)
(proximity sensor is activated)_ test distance is 0mm)</td></tr>
<tr><td colspan="4">GPRS 1900</td></tr>
<tr><td colspan="4">0.978
At GPRS 1900_ CH810_ Front side mode_(2 multi-slot)
(proximity sensor is not activated)_ test distance is 10mm)</td></tr>
<tr><td colspan="4">WCDMA Band II</td></tr>
<tr><td colspan="4">1.38
At WCDMA Band II_ CH9400_ Lap-held mode
(proximity sensor is activated)_ test distance is 0mm)</td></tr>
<tr><td colspan="4">WCDMA Band V</td></tr>
<tr><td colspan="4">1.02
At WCDMA Band V_ CH4182_ Lap-held mode
(proximity sensor is activated)_ test distance is 0mm)</td></tr>
<tr><td rowspan="2">Declaration</td><td colspan="4">Second solution(change wahyu antenna)</td></tr>
<tr><td colspan="4">In addition to the Original sample shown in these test results, model ThinkPad Tablet / TP28000AE also has an option for a wahyu antenna; SAR values were checked on these options using the spot check method. We found results were same or lower than Original for GPRS850/GPRS1900/ WCDMA Band II/ WCDMA Band V,but still within 20% of highest measured SAR.</td></tr>
</table>

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Antenna Type:	Fixed Integrated antenna PIFA type (Main) ➔ ACON P/M: DC33000W300 (Aux) ➔ ACON P/M: DC33000W310 (Main) ➔ WahYu P/N: DC33000XZ00 (Aux) ➔ WahYu P/N: DC33000XZ10

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Maximum GSM Power

		Burst Average Power				
			GPRS/EDGE (GMSK)		EDGE (8PSK)	
Band	Frequency Range (MHz)	Channel	GPRS (dBm) 1 uplink Slot	GPRS (dBm) 2 uplink Slot	EDGE (dBm) 1 uplink Slot	EDGE (dBm) 2 uplink Slot
850	824.2 - 848.8	128	32.6	29.48	26.6	26.6
		189	32.3	29.59	26.68	26.68
		251	32.35	29.7	26.81	26.81
1900	1850.2 - 1909.8	512	29.9	28.4	26.02	25.47
		661	29.4	28.35	25.8	25.51
		810	29.55	28.5	26.01	25.64

		Calculated Source-Based Time Average Power				
			GPRS/EDGE (GMSK)		EDGE (8PSK)	
Band	Frequency Range (MHz)	Channel	GPRS (dBm) 1 uplink Slot	GPRS (dBm) 2 uplink Slot	EDGE (dBm) 1 uplink Slot	EDGE (dBm) 2 uplink Slot
850	824.2 - 848.8	128	23.57	**23.46**	17.57	20.58
		189	23.27	**23.57**	17.65	20.66
		251	23.32	**23.68**	17.78	20.79
1900	1850.2 - 1909.8	512	20.87	**22.38**	16.99	19.45
		661	20.37	**22.33**	16.77	19.49
		810	20.52	**22.48**	16.98	19.62

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GPRS/EDGE Powers with Reduction

		Burst Average Power				
			GPRS/EDGE (GMSK)		EDGE (8PSK)	
Band	Frequency Range (MHz)	Channel	GPRS (dBm) 1 uplink Slot	GPRS (dBm) 2 uplink Slot	EDGE (dBm) 1 uplink Slot	EDGE (dBm) 2 uplink Slot
850	824.2 - 848.8	128	28.41	25.52	24.64	24.65
		189	28.45	25.65	24.74	24.74
		251	28.16	25.84	24.88	24.89
1900	1850.2 - 1909.8	512	25.35	22.65	23.46	22.49
		661	25.34	22.61	23.53	22.53
		810	25.42	22.65	23.65	22.65

		Calculated Source-Based Time Average Power				
			GPRS/EDGE (GMSK)		EDGE (8PSK)	
Band	Frequency Range (MHz)	Channel	GPRS (dBm) 1 uplink Slot	GPRS (dBm) 2 uplink Slot	EDGE (dBm) 1 uplink Slot	EDGE (dBm) 2 uplink Slot
850	824.2 - 848.8	128	19.38	**19.50**	15.61	18.63
		189	19.42	**19.63**	15.71	18.72
		251	19.13	**19.82**	15.85	18.87
1900	1850.2 - 1909.8	512	16.32	**16.63**	14.43	16.47
		661	16.31	**16.59**	14.50	16.51
		810	16.39	**16.63**	14.62	16.58

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Slot Factor

Frame Average Factor (Source Based Time Average Factor)	
1Tx (1 slot of uplink Transmission)	2Tx (2 slots of uplink Transmission)
-9.03	-6.02

Note1: Source-Based Average power has been determined by the addition with the measured burst-average power. The GPRS/EDGE mode with GSMK modulation scheme as boldlize in red as table of data above are chosen to perform SAR testing in accordance with KDB 941225 D-03 in which highest output power in sourced-based time average mode shall be used to perform the corresponding SAR test.

Note2: The given device is pure Data-Only device at which GSM function is disabled, and since CS and PS are not co-existed while operation, DTM is not applicable to this given DUT of the application.

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WCDMA Band II / Band V(Not Power back-off)

Freq. Band	Frequency	CH	R99 Avg. Power	HSDPA mode Avg. Power				HSUPA mode Avg. Power				
	(MHz)		(dBm)	SUB-1	SUB-2	SUB-3	SUB-4	SUB-1	SUB-2	SUB-3	SUB-4	SUB-5
WCDMA Band II	1852.4	9262	22.7	22.87	22.58	22.39	22.46	22.62	20.67	21.68	20.8	22.51
	1880.0	9400	22.73	22.62	22.59	22.17	22.18	22.71	20.78	21.73	20.83	22.57
	1907.6	9538	22.78	22.64	22.63	22.11	22.23	22.72	20.76	21.8	20.8	22.63
Freq. Band	**Frequency**	**CH**	**Avg. Power**	**HSDPA mode Avg. Power**				**HSUPA mode Avg. Power**				
	(MHz)		**(dBm)**	**SUB-1**	**SUB-2**	**SUB-3**	**SUB-4**	**SUB-1**	**SUB-2**	**SUB-3**	**SUB-4**	**SUB-5**
WCDMA Band V	826.4	4132	23.8	22.62	20.67	21.68	20.8	23.76	21.82	22.8	21.87	23.62
	836.4	4182	23.75	22.71	20.78	21.73	20.83	23.66	21.74	22.72	21.8	23.49
	846.6	4233	23.95	22.72	20.76	21.8	20.8	23.87	21.91	22.95	21.99	23.76

WCDMA Band II / Band V(Power back-off)

Freq. Band	Frequency	CH	R99 Avg. Power	HSDPA mode Avg. Power				HSUPA mode Avg. Power				
	(MHz)		(dBm)	SUB-1	SUB-2	SUB-3	SUB-4	SUB-1	SUB-2	SUB-3	SUB-4	SUB-5
WCDMA Band II	1852.4	9262	21.08	21.25	20.96	20.77	20.84	21	19.05	20.06	19.18	20.89
	1880.0	9400	21.20	21.09	21.06	20.64	20.65	21.18	19.25	20.2	19.3	21.04
	1907.6	9538	21.10	20.96	20.95	20.43	20.55	21.04	19.08	20.12	19.12	20.95
Freq. Band	**Frequency**	**CH**	**Avg. Power**	**HSDPA mode Avg. Power**				**HSUPA mode Avg. Power**				
	(MHz)		**(dBm)**	**SUB-1**	**SUB-2**	**SUB-3**	**SUB-4**	**SUB-1**	**SUB-2**	**SUB-3**	**SUB-4**	**SUB-5**
WCDMA Band V	826.4	4132	17.91	17.7	17.84	17.24	17.29	17.87	15.93	16.91	15.98	17.73
	836.4	4182	17.84	17.7	17.73	17.22	17.26	17.77	15.85	16.83	15.91	17.6
	846.6	4233	17.66	17.78	17.53	17.29	17.35	17.58	15.62	16.66	15.7	17.47

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The Deficit of Power

Band	Frequency Range (MHz)	Channel	GPRS/EDGE (GMSK) GPRS (dBm) 1uplink Slot	GPRS/EDGE (GMSK) GPRS (dBm) 2uplink Slot	EDGE (8PSK) EDGE (dBm) 1uplink Slot	EDGE (8PSK) EDGE (dBm) 2uplink Slot
850	824.2 - 848.8	128	**4.19**	3.96	**1.96**	1.95
		190	3.85	3.94	1.94	1.94
		250	**4.19**	3.86	1.93	1.92
1900	1850.2 - 1909.8	512	4.55	5.75	2.56	2.98
		661	4.06	5.74	2.27	2.98
		810	4.13	**5.85**	2.36	**2.99**

Band	Freq.	R99 Avg. Power	HSDPA mode / Avg. Power				HSUPA mode / Avg. Power				
			Sub-1	Sub-2	Sub-3	Sub-4	Sub-1	Sub-2	Sub-3	Sub-4	Sub-5
WCDMA BII	1852.4	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
	1880	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53
	1907.6	**1.68**	**1.68**	1.68	1.68	1.68	**1.68**	1.68	1.68	1.68	1.68
WCDMA BV	826.4	5.89	4.92	2.83	4.44	3.51	5.89	5.89	5.89	5.89	5.89
	836.4	5.91	**5.01**	3.05	4.51	3.57	5.89	5.89	5.89	5.89	5.89
	846.6	**6.29**	4.94	3.23	4.51	3.45	**6.29**	6.29	6.19	6.29	6.29

Note: The table as presented above records the result of power difference in burst mode between full power when sensor is de-activated and power reduction when sensor is activated. The data as boldlize in red highlights the largest difference at each transmission mode.

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1.4 Test Environment

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

1.5 Operation description

Device description :

INDIGO support GPRS/EGPRS/WCDMA/HSDPA/HSUPA, technology. The conducted power of EGPRS850, EGPRS1900 will not reduced even proximity sensor actives.

The others are shown as below:

Ericsson F5521gw

Mode(s) of operation	GPRS/ EGPRS 850 MSC 1-4 (GMSK)	EGPRS 850 MSC 5-9 (8-PSK)	GPRS/ EGPRS 1900 MSC 1-4 (GMSK)	EGPRS 1900 MSC 5-9 (8-PSK)
Max. output power setting	31.27± 1 dBm	25.81± 1 dBm	28.22± 1 dBm	24.64± 1 dBm
Reduced Max. output power setting	29.66± 1 dBm	N/A	26.52± 1 dBm	N/A
Transmitting frequency range(s)	824 – 849 MHz		1850 – 1910 MHz	

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Mode(s) of operation	WCDMA B2	WCDMA B5
Max. output power setting	21.96± 1dBm	23.14± 1dBm
Reduced Max. output power setting	16.91± 1dBm	20.2± 1dBm
Transmitting frequency range(s)	1850 – 1910 MHz	824 – 849 MHz

Due to proximity sensing antennas in INDIGO are placed next to GPRS/WCDMA main antenna and detect distance are limited by sensing antennas. That's why Primary landscape, secondary landscape and primary portrait mode of conduct power reduction will not active during SAR measurements due to out of detect range. But, proximity sensor itself is "always available" independent of display orientation.

In real case, when end user operates in landscape mode for example. Proximity sensor will be triggered while human's hand approaches GPRS/WCDMA main antenna and vice versa. Moreover, proximity sensor's functionality will not be impacted even A/C adapter is plugged. More detail information about proximity sensor will be described in next section.

Proximity Sensor description :

There exists a capacitance between any reference points relative to ground, as long as electrical isolation exists between them. If this reference point is a sensing plate (or sense antenna), it helps to think of it as a capacitor. The positive plate of the capacitor is the sensing plate, and the negative plate is formed by the surrounding area.

For example, a human hand will increase the sense plate capacitance as it approaches the sense plate. Touching the plate will increase the capacitance significantly.

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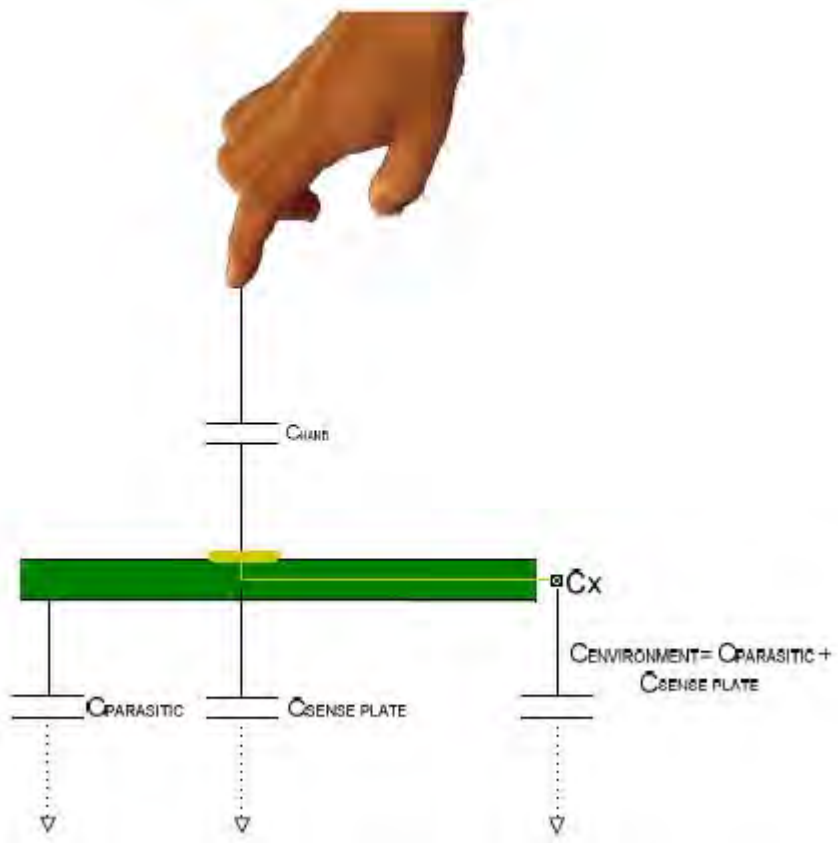

Figure 1.1 Illustration of environmental capacitance

The sense plate (or sense antenna) can be any electrically conductive object. This includes glass or perspex plates with a conductive surface, or the base of a metal desk lamp. In this project, we use two sensing plates (or sense antennas) in INDIGO. One is at the right side of GSM/WCDMA main antenna and the other is at the left side of GSM/WCDMA main antenna. The sense plate is connected to the CX Pin of all modules. The capacitance of the CX plate is referred to as CX.

The following graphs are proximity sensor activation vs. output power of each module. Briefly speaking, the detect distance of INDIGO from phantom body to Bottom side is 11mm at least and the detect distance from phantom body to INDIGO edge side is 10mm at least. And we will test bottom/edge SAR when d=11mm at bottom side & d=10mm at edge side. Consider 45 degree tilt usage with respect to proximity sensor at screen side, the detect distance of INDIGO from phantom body to Device Under Test is 10mm at least also.

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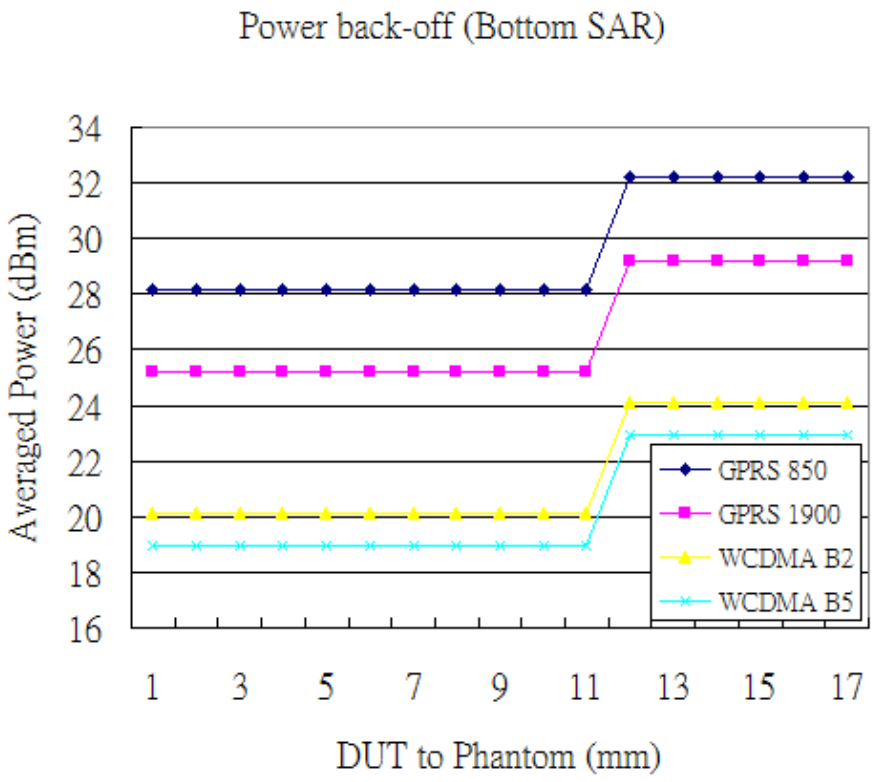
Proximity Sensor Activation (Ericsson F5521gw)
Max. Output Power vs. Distance from the body phantom



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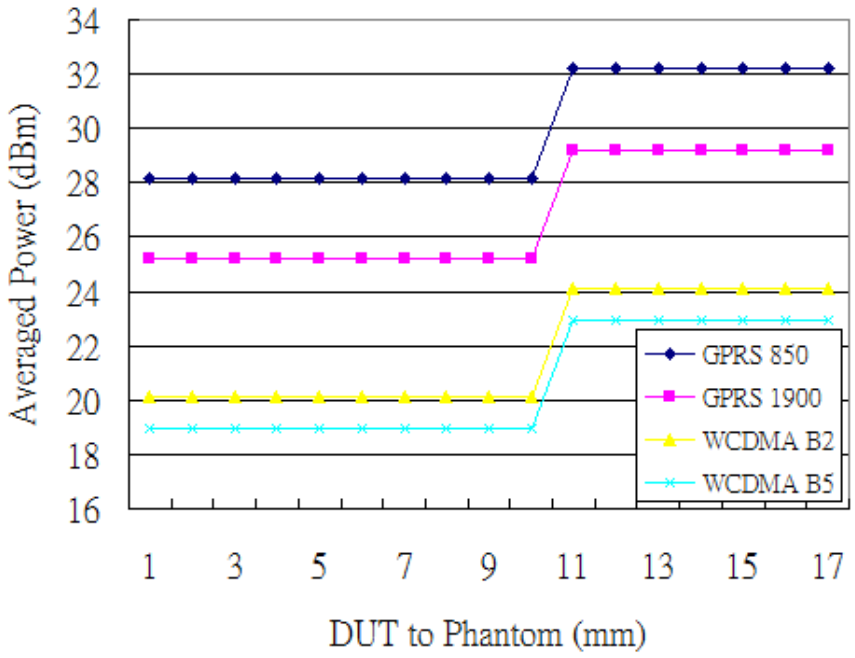
Power back-off (Edge SAR)



Power back-off (tilt 45 degrees at screen side)

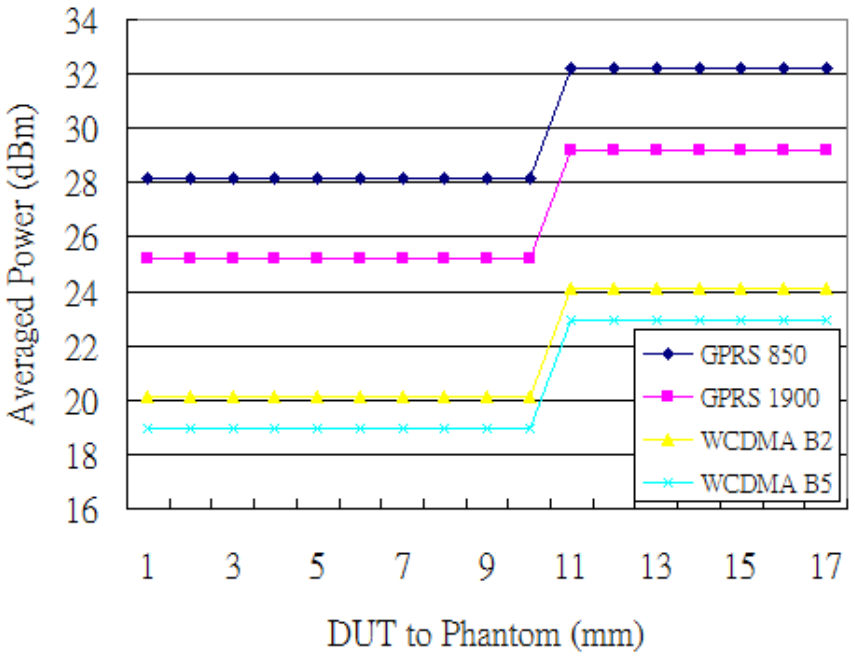


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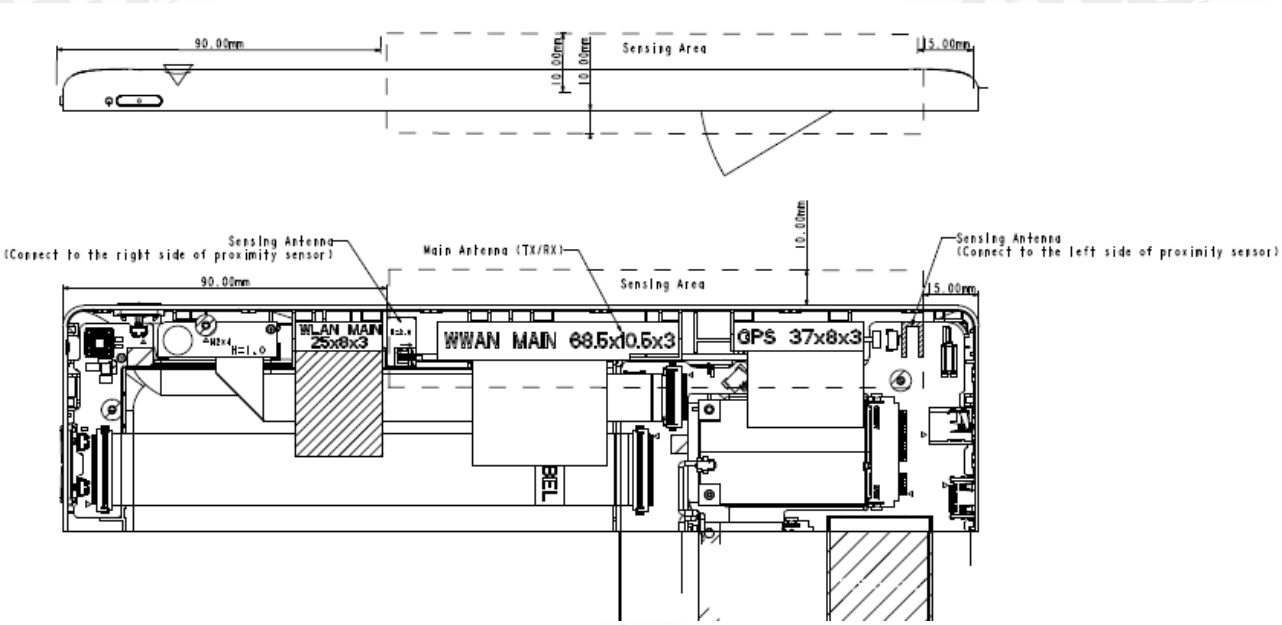
Figure C is the proximity sensor and power limit activation flow chart in INDIGO. One is placed at the right side of GSM/WCDMA main antenna and the other is at the left side of GSM/WCDMA main antenna. While human body approach the sensing antenna of proximity sensor near the right side of GSM/WCDMA main antenna, right proximity sensor will info. Nvidia T20 then reduces power by AT command.



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While human body approach the sensing antenna of proximity sensor near the left side of GSM/WCDMA main antenna, left proximity sensor will info. Nvidia T20 then reduces power by AT command also. Both right and left proximity sensors use the same GPIO pin of Nvidia T20, this means power reduction will be triggered either one of the proximity sensor works.

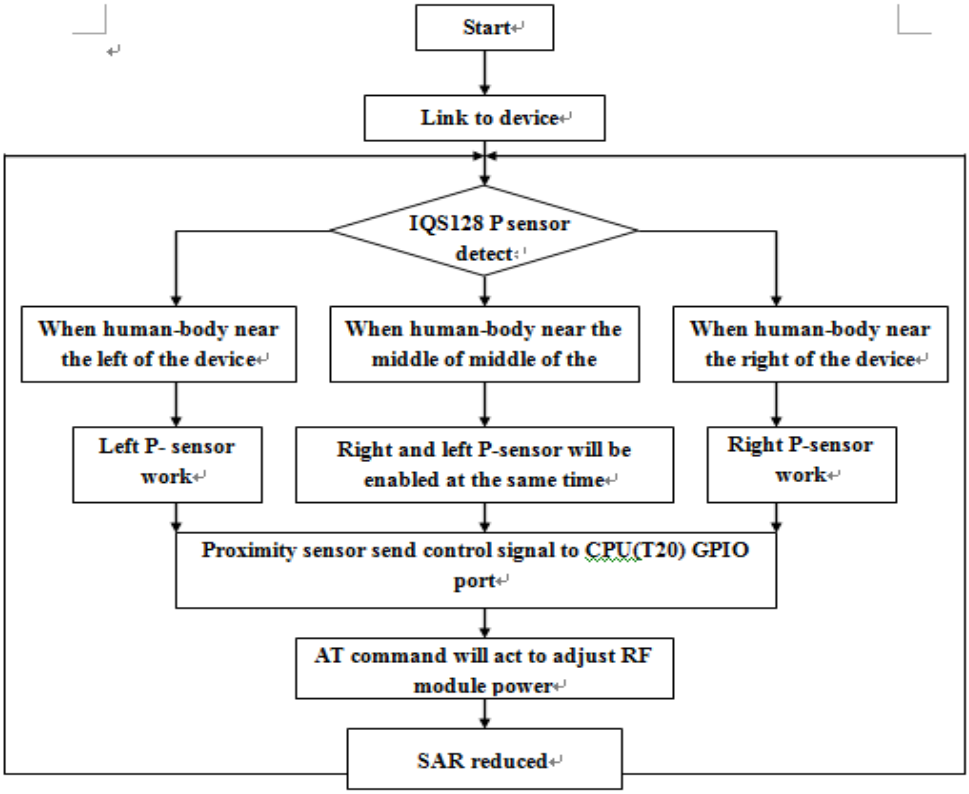

Figure C Control flow chart of human body sensing

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Proposed SAR test plan

The EUT WWAN is controlled by using a Radio Communication Tester, and the communication between the EUT and the tester is established by air link. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
Since the overall device diagonal size is larger than 200mm, according to KDB447498 , Lab should test this device in highest power with 3 configurations below (highlighted with bold)

Configuration 1: Lap-held mode. (back side of device is parallel to human body, proximity sensor is activated)
Configuration 2: Primary Portrait mode. (Not tested, since distance of WWAN antenna to edge is 85.22mm , which is larger than 5cm)
Configuration 3: Secondary Portrait mode. (Not tested, since distance of WWAN antenna to edge is 106.68mm , which is larger than 5cm)
Configuration 4: Primary Landscape mode. (Not tested, since distance of WWAN antenna to edge is 166.4 mm , which is larger than 5cm)
Configuration 5: Secondary Landscape mode. (proximity sensor is activated)
Configuration 6: Front side mode. (proximity sensor is not activated)

Full power test: (Test distance is 10 mm)
Configuration 7: Lap-held mode. (back side of device is parallel to human body, proximity sensor is not activated)
Configuration 8: Secondary Landscape mode. (proximity sensor is not activated)

#. If the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.
#. When the maximum transmitter and antenna output power are ≦ 60/f(GHz) (mW) SAR evaluation is not required for FCC or TCB approval.

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#. Per KDB941225 FCC 3G procedures, HSDPA and HSUPA have been omitted since the maximum transmit power results are NOT 1/4dB larger than the WCDMA R99 test result.

#. Per KDB941225 D03 procedures, EGPRS/EDGE have been omitted since the maximum transmit power results are less than the GPRS test results.

#. The highest 1-g SAR for WLAN is 0.459 W/kg_ Lap-held mode (Refer to SGS Report No.EN/2011/60009) and the highest 1-g SAR for WWAN is 1.38 W/kg_ Lap-held mode. The sum of 1-g for simultaneous transmitting WLAN and WWAN antenna pair is 0.459+1.38 = 1.839 W/kg > 1.6 W/kg which higher than the limit 1.6W/kg.

TX configuration	**Σof SAR** Lap-held Mode	**Note**
GPRS850 + WLAN802.11 b	0.616 W/kg + 0.459 W/kg =1.075 W/kg	Full Power
GPRS 1900 + WLAN802.11 b	0.453 W/kg + 0.459 W/kg =0.912 W/kg	Full Power
WCDMA BII + WLAN802.11 b	0.574 W/kg + 0.459 W/kg =1.033 W/kg	Full Power
WCDMA BV + WLAN802.11 b	0.462 W/kg + 0.459 W/kg =0.921 W/kg	Full Power
GPRS850 + WLAN802.11 b	0.926 W/kg + 0.459 W/kg =1.385 W/kg	Power Reduction
GPRS1900 + WLAN802.11 b	0.789 W/kg + 0.459 W/kg =1.248 W/kg	Power Reduction
WCDMA BII + WLAN802.11 b	1.38 W/kg + 0.459 W/kg =**1.839 W/kg**	Power Reduction
WCDMA BV + WLAN802.11 b	1.02 W/kg + 0.459 W/kg =1.479 W/kg	Power Reduction

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#.By the way, the hotspot peak to peak distance for WWAN and WLAN is **6.1561 cm**, we have made my calculations per the DASY and SEMCAD document: TN_110201_DASY_Calculate_Hotspot_Distance.

% Value of SAR		X		Y		Z		
% mW/g		m		m		m		
1.38		0.00603		-0.0006		-0.207		WWAN
0.459		-0.0332		-0.048		-0.205		WLAN
m	cm							
0.061561	**6.1561**							

#. We calculate the peak location separation ratio of simultaneous transmitting antenna pair, the value is **0.298 (**(1.38+0.459)/6.1561=0.298**)**, which less than 0.3. According to **KDB648474,** simultaneous SAR evaluation is not required.

The brief of SAR result

GPRS 850 SAR Result

Measurement Results									
Frequency		Mode	Conducted Power (dBm)	Power Drift (dBm)	Power Reduction (dB)	Spacing	Number of GPRS Slot	Test Config.	SAR (1g)
MHz	Ch.								(W/kg)
824.20	128	GPRS 850	19.50	0.002	3.96	0mm	2 slot	Lap-held	0.926
836.40	189	GPRS 850	19.63	0.007	3.94	0mm	2 slot	Lap-held	0.828
848.80	251	GPRS 850	19.82	0.1	3.86	0mm	2 slot	Lap-held	0.696
836.40	189	GPRS 8500	19.63	-0.041	3.94	0mm	2 slot	Secondary landscape	0.297
836.40	189	GPRS 850	23.57	-0.052	0	10mm	2 slot	Front side	0.315
836.40	189	GPRS 850	23.57	0.19	0	10mm	2 slot	Lap-held	0.616
836.40	189	GPRS 850	23.57	-0.15	0	10mm	2 slot	Secondary landscape	0.303

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GPRS1900 SAR Result

Measurement Results									
Frequency		Mode	Conducted Power (dBm)	Power Drift (dBm)	Power Reduction (dB)	Spacing	Number of GPRS Slot	Test Config.	SAR (1g) (W/kg)
MHz	Ch.								
1880	661	GPRS 1900	16.59	-0.133	5.74	0mm	2 slot	Lap-held	0.789
1880	661	GPRS 1900	16.59	-0.01	5.74	0mm	2 slot	Secondary landscape	0.669
1850.2	512	GPRS 1900	22.38	-0.032	5.75	10mm	2 slot	Front side	0.740
1880	661	GPRS 1900	22.33	-0.049	5.74	10mm	2 slot	Front side	0.897
1909.8	810	GPRS 1900	22.48	-0.116	5.85	10mm	2 slot	Front side	0.978
1880	661	GPRS 1900	22.33	-0.02	0	10mm	2 slit	Lap-held	0.435
1880	661	GPRS 1900	22.33	0.05	0	10mm	2 slit	Secondary landscape	0.797

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WCDMA Band II SAR Result

Measurement Results									
Frequency		Mode	Conducted Power (dBm)	Power Drift (dBm)	Power Reduction (dB)	Spacing	Number of GPRS Slot	Test Config.	SAR (1g)
MHz	Ch.								(W/kg)
1852.4	9262	R99	21.08	-0.001	1.62	0mm	NA	Lap-held	1.25
1880	9400	R99	21.20	0.029	1.53	0mm	NA	Lap-held	1.38
1907.6	9538	R99	21.10	0.013	1.68	0mm	NA	Lap-held	1.37
1852.4	9262	R99	21.08	0.033	1.62	0mm	NA	Secondary landscape	1.14
1880	9400	R99	21.20	-0.1	1.53	0mm	NA	Secondary landscape	1.14
1907.6	9538	R99	21.10	-0.128	1.68	0mm	NA	Secondary landscape	1.11
1852.4	9262	R99	22.7	-0.090	0	10mm	NA	Front side	0.944
1880	9400	R99	22.73	-0.043	0	10mm	NA	Front side	0.968
1907.6	9538	R99	22.78	0	0	10mm	NA	Front side	1.00
1880	9400	R99	22.73	-0.14	0	10mm	NA	Lap-held	0.574
1852.4	9262	R99	22.7	-0.08	0	10mm	NA	Secondary landscape	1.07
1880	9400	R99	22.73	-0.09	0	10mm	NA	Secondary landscape	0.989
1907.6	9538	R99	22.78	-0.10	0	10mm	NA	Secondary landscape	0.891

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WCDMA Band V SAR Result

Measurement Results									
Frequency		Mode	Conducted Power (dBm)	Power Drift (dBm)	Power Reduction (dB)	Spacing	Number of GPRS Slot	Test Config.	SAR (1g) (W/kg)
MHz	Ch.								
826.4	4132	R99	17.91	-0.071	5.89	0mm	NA	Lap-held	1.01
836.4	4182	R99	17.84	-0.098	5.91	0mm	NA	Lap-held	1.02
846.60	4233	R99	17.66	0.050	6.29	0mm	NA	Lap-held	0.980
836.4	4182	R99	17.84	-0.028	0	0mm	NA	Secondary landscape	0.420
836.4	4182	R99	23.75	0.034	0	0mm	NA	Front side	0.331
836.4	4182	R99	22.75	-0.02	0	10mm	NA	Lap-held	0.462
836.4	4182	R99	22.75	-0.19	0	10mm	NA	Front side	0.311

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1.6 The SAR Measurement System

A photograph 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 4 /Dasy 5professional system). A Model EX3DV4 field probe is 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.

The DASY4 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.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc.

The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

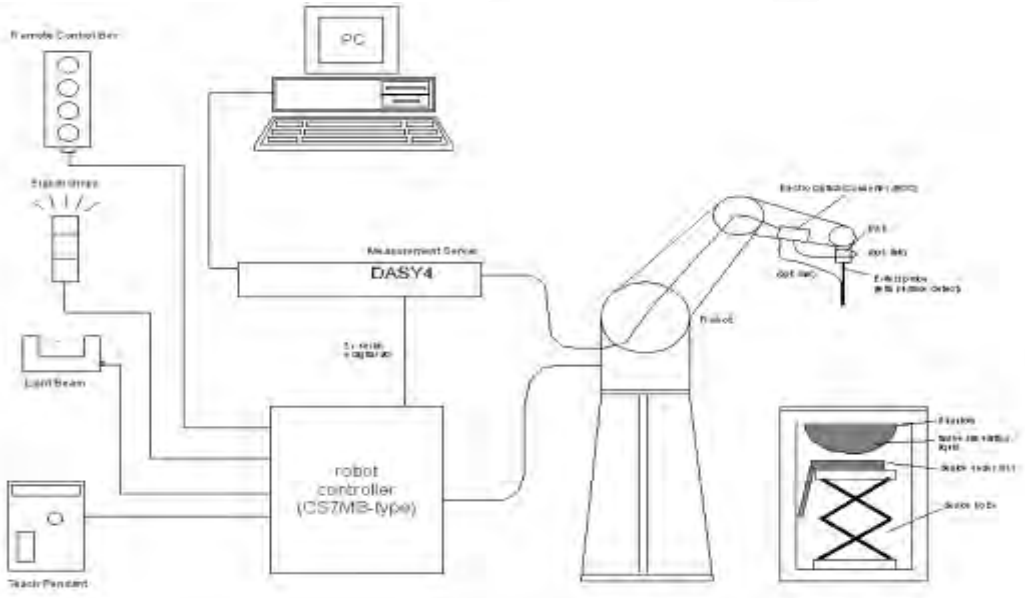

Fig.a The block diagram of SAR system

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- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
  - A computer operating Windows 2000 or Windows XP.
  - DASY4/Dasy5 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.

1.7 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 MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	

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Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 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%.

SAM PHANTOM V4.0C

Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 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: 251 mm; Length: 1000 mm; Width: 500 mm	

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DEVICE HOLDER

Construction	The device holder (Supporter) for Notebook is made by POM (polyoxymethylene resin) , which is non-metal and non-conductive. The height can be adjusted to fit varies kind of notebooks.	 Device Holder

1.8 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 +/- 5% from the target SAR values. These tests were done at 835/1900 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 (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range 22.1°C, the relative humidity was in the range 62% and the liquid depth above the ear reference points was above 15 cm 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.

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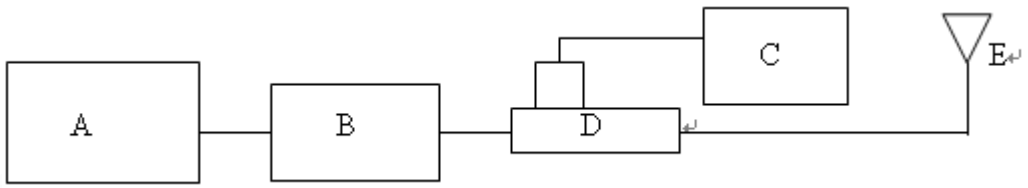
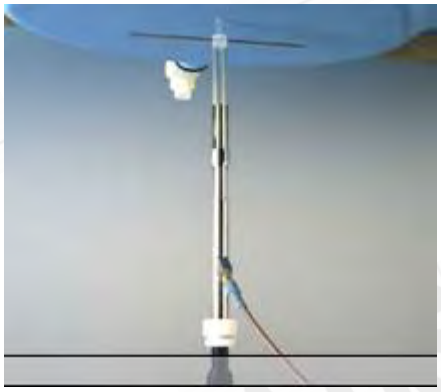


Fig.b The block diagram of system verification

A. Agilent Model 8648D Signal Generator
B. Mini circuits Model ZHL-42 Amplifier
C. Agilent ModelU2001B Power sensor
D. Agilent Model 778D Dual directional coupling
E. Reference dipole antenna



Photograph of the dipole Antenna

Validation Kit	Frequency Hz	Target SAR (1g) (Pin=250mW)	Measured SAR (1g)	Measured Date
D835V2 S/N:4d063	850 MHz (Body)	2.43mW/g	2.4mW/g	2011-07-24
D1900V2 S/N:5d027	1900 MHz (Body)	9.93mW/g	9.94 mW/g	2011-07-25
D835V2 S/N:4d063	850 MHz (Body)	2.43mW/g	2.42mW/g	2011-08-04
D1900V2 S/N:5d027	1900 MHz (Body)	9.93mW/g	9.99 mW/g	2011-08-04
D835V2 S/N:4d063	850 MHz (Body)	2.43mW/g	2.45mW/g	2011-09-02
D1900V2 S/N:5d027	1900 MHz (Body)	9.93mW/g	9.7mW/g	2011-09-02

Table 2. Results of system validation

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1.9 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this body-simulant fluid were measured by using the Agilent Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with HP 8753D Network Analyzer (30 KHz-6000 MHz).
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 15cm±5mm during all tests. (Fig .2)

Frequency (MHz)	Tissue type	Measurement date/ Limits	Dielectric Parameters		
			ρ	σ (S/m)	Simulated Tissue Temperature(° C)
850	Body	Measured, 2011.07.24	55.3	1.02	21.7
		Recommended Limits	51.21-56.60	0.95-1.05	20-24
1900	Body	Measured, 2011.07.25	51.5	1.59	21.7
		Recommended Limits	48.55-53.66	1.44-1.6	20-24
850	Body	Measured, 2011.08.04	55.4	1.02	21.7
		Recommended Limits	51.21-56.60	0.95-1.05	20-24
1900	Body	Measured, 2011.08.04	51.4	1.58	21.7
		Recommended Limits	48.55-53.66	1.44-1.6	20-24
850	Body	Measured, 2011.09.02	53.847	1.01	21.7
		Recommended Limits	51.21-56.60	0.95-1.05	20-24
1900	Body	Measured, 2011.09.02	51.545	1.523	21.7
		Recommended Limits	48.55-53.66	1.44-1.6	20-24

Table 3. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the body tissue simulating liquid is:

Ingredient	850MHz (Body)	1900MHz (Body)
DGMBE	X	300.67g
Water	631.68 g	716.56 g
Salt	11.72 g	4.0 g
Preventol D-7	1.2 g	X
Cellulose	X	X
Sugar	600 g	X
Total amount	1 L (1.0kg)	1 L (1.0kg)

Table 3. Recipes for tissue simulating liquid

1.10 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

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interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.
The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for 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.

1.11 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

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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 an 10 grams of tissue (defined as a tissue volume in the shape of a cube).

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

(3) 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 .4)

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

Table .4 RF exposure limits

Notes:

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

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2. Summary of Results

Acon antenna

GPRS 850_(2 multi-slot_2UP_1Dn)

Lap-held mode: (proximity sensor is activated)_0 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	128	824.20	19.50dBm	0.926	22.1	21.7
	189	836.40	19.63dBm	0.828	22.1	21.7
	251	848.80	19.82dBm	0.696	22.1	21.7
Secondary landscape mode: (proximity sensor is activated)_0 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	189	836.40	19.63dBm	0.297	22.1	21.7
Front side mode: (proximity sensor is not activated)_10 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	189	836.40	23.57dBm	0.315	22.1	21.7

#. Using KDB941225 D03 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower than that in the GPRS mode.

#. According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

#.GPRS 850 class10 for 2 multi-slot : the maximum number of uplink is 2 and the maximum number of downlink is 1.

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GPRS 850_(2 multi-slot_2UP_1Dn)_Full power test

Lap-held mode: (proximity sensor is not activated)_10 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	189	836.40	23.57dBm	0.616	22.1	21.7
Secondary landscape mode: (proximity sensor is not activated)_10 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	189	836.40	23.57dBm	0.303	22.1	21.7

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GPRS 1900(2 multi-slot_2UP_1Dn)

Lap-held mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	661	1880.00	16.59dBm	0.789	22.1	21.7
Secondary landscape mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	661	1880.00	16.59dBm	0.669	22.1	21.7
Front side mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	512	1850.20	22.38dBm	0.740	22.1	21.7
	661	1880.00	22.33dBm	0.897	22.1	21.7
	810	1909.80	22.48dBm	0.978	22.1	21.7

#. Using KDB941225 D03 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower than that in the GPRS mode.

#. According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

#.GPRS 1900 class10 for 2 multi-slot : the maximum number of uplink is 2 and the maximum number of downlink is 1.

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GPRS 1900(2 multi-slot_2UP_1Dn) _Full power test

Lap-held mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	661	1880.00	22.33dBm	0.453	22.1	21.7
Secondary landscape mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	661	1880.00	22.33dBm	0.797	22.1	21.7

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WCDMA Band II

Lap-held mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	9262	1852.40	21.08dBm	1.25	22.1	21.7
	9400	1880.00	21.20dBm	1.38	22.1	21.7
	9538	1907.60	21.10dBm	1.37	22.1	21.7
Secondary landscape mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	9262	1852.40	21.08dBm	1.14	22.1	21.7
	9400	1880.00	21.20dBm	1.14	22.1	21.7
	9538	1907.60	21.10dBm	1.11	22.1	21.7
Front side mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	9262	1852.40	22.7dBm	0.944	22.1	21.7
	9400	1880.00	22.73dBm	0.968	22.1	21.7
	9538	1907.60	22.78dBm	1.00	22.1	21.7

#. Using KDB941225 D01 to exclude SAR test requirements for HSPA modes due to the maximum average output power of HSPA active is less than 1/4 dB higher than that measured without HSPA using 12.2kbps RMC

#. According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

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WCDMA Band II_ Full power test

Lap-held mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	9400	1880.00	22.73dBm	0.574	22.1	21.7
Secondary landscape mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	9262	1852.40	22.7dBm	1.07	22.1	21.7
	9400	1880.00	22.73dBm	0.989	22.1	21.7
	9538	1907.60	22.78dBm	0.891	22.1	21.7

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WCDMA Band V

Lap-held mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	4132	826.40	17.91dBm	1.01	22.1	21.7
	4182	836.40	17.84dBm	1.02	22.1	21.7
	4233	846.60	17.66dBm	0.980	22.1	21.7
Secondary landscape mode: (proximity sensor is activated) _0 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	4182	836.40	17.84dBm	0.420	22.1	21.7
Front side mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	4182	836.40	23.75dBm	0.331	22.1	21.7

#. Using KDB941225 D01 to exclude SAR test requirements for HSPA modes due to the maximum average output power of HSPA active is less than 1/4 dB higher than that measured without HSPA using 12.2kbps RMC

#. According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

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WCDMA Band V_Full power test

Lap-held mode: (proximity sensor is Not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	4182	836.40	23.75dBm	0.462	22.1	21.7
Secondary landscape mode: (proximity sensor is NOT activated) _10 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	4182	836.40	23.75dBm	0.311	22.1	21.7

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Wahyu antenna

Lap-held mode: (proximity sensor is activated)_0 mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	128	824.20	19.50dBm	0.576	22.1	21.7
Front side mode: (proximity sensor is not activated) _10mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	810	1909.80	16.63dBm	0.258	22.1	21.7
Lap-held mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
1900MHz	9400	1880.00	21.20dBm	0.893	22.1	21.7
Lap-held mode: (proximity sensor is activated) _0mm						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[˚C]	Liquid Temp[˚C]
850MHz	4182	836.40	17.84dBm	0.587	22.1	21.7

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3. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration
Schmid & Partner Engineering AG	Dosimetric E-Field Probe	EX3DV4	3770	Apr.19.2011
Schmid & Partner Engineering AG	850/1900 MHz System Validation Dipole	D835V2	4d063	May.25.2010
		D1900V2	5d027	Apr.19.2011
Schmid & Partner Engineering AG	Data acquisition Electronics	DAE4	547 856	Aug.18.2010 May.18.2011
Schmid & Partner Engineering AG	Software	DASY 4 V4.7 Build 80	N/A	Calibration not required
Schmid & Partner Engineering AG	Phantom	SAM	N/A	Calibration not required
HP	Network Analyzer	8753D	3410A05547	Mar.16.2011
HP	Dielectric Probe Kit	85070D	US01440168	Calibration not required
Agilent	Dual-directional coupler	778D	50313	Aug.25.2010 Aug.19.2011
Agilent	RF Signal Generator	8648D	3847M00432	Jun.01.2011
Agilent	Power Sensor	U2001B	MY48100169	Apr.28.2011
R&S	Radio Communication Test	CMU200	113505	May.31.2011

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4. Measurements

Date: 2011/7/24

Lap-held _GPRS850_CH128_Acon antenna

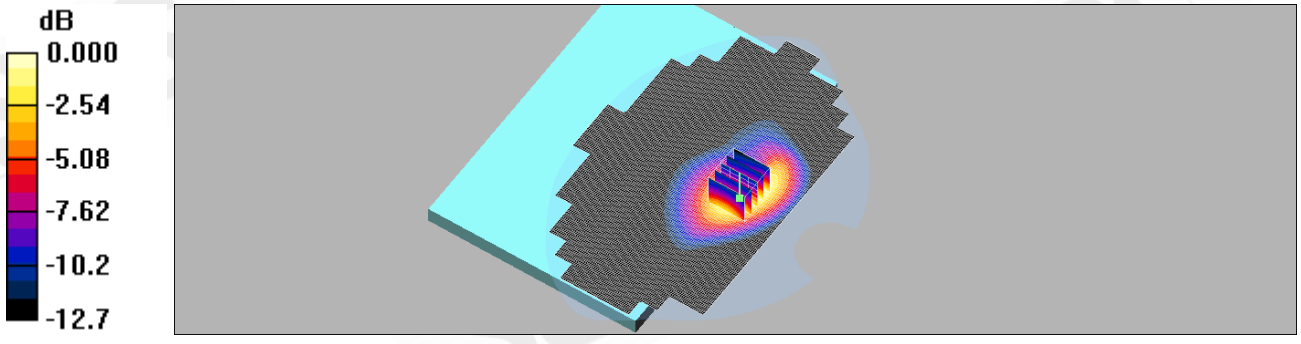
Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4
Medium: Muscle 900 MHz Medium parameters used (interpolated): f = 824.2 MHz; σ = 1 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.00 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.926 mW/g; SAR(10 g) = 0.538 mW/g
Maximum value of SAR (measured) = 0.998 mW/g



0 dB = 0.998mW/g

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Lap-held _GPRS850_CH189_Acon antenna

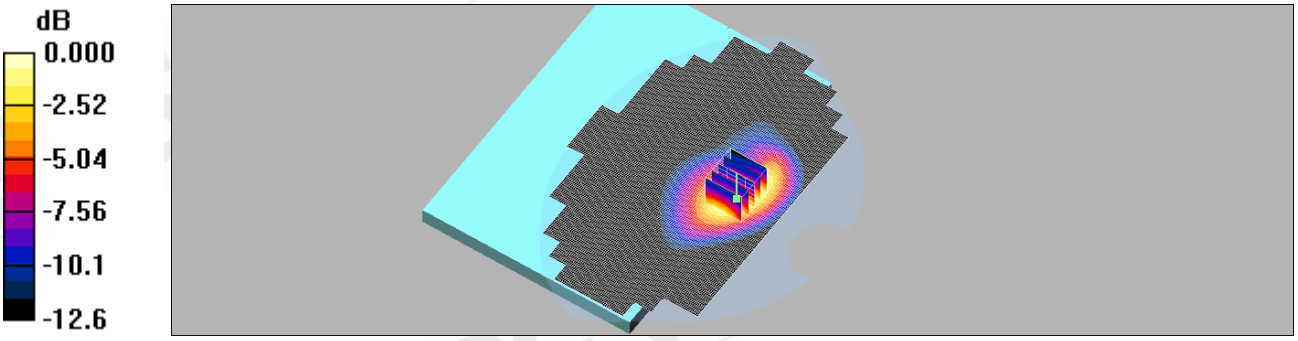
Communication System: GSM 850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.891 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.0 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.828 mW/g; SAR(10 g) = 0.479 mW/g
Maximum value of SAR (measured) = 0.880 mW/g



0 dB = 0.880mW/g

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Lap-held _GPRS850_CH251_Acon antenna

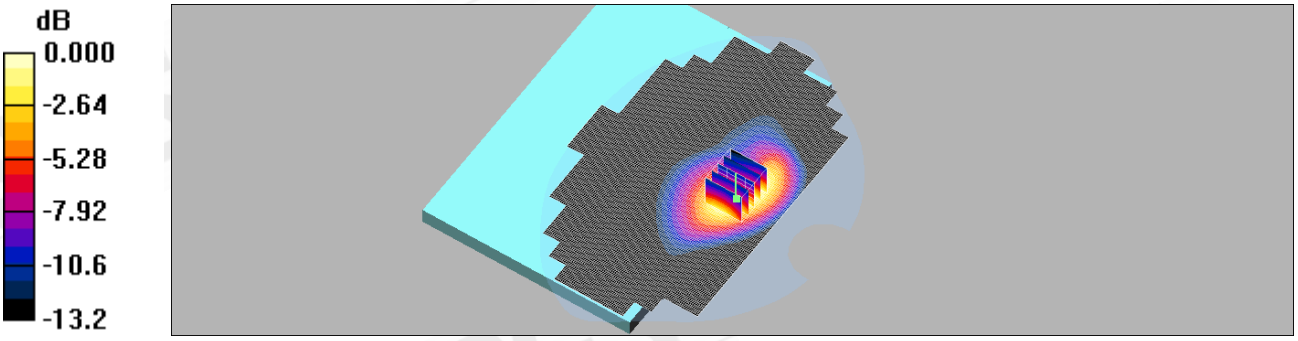
Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:4
Medium: Muscle 900 MHz Medium parameters used: f = 849 MHz; σ = 1.03 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.758 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.696 mW/g; SAR(10 g) = 0.403 mW/g
Maximum value of SAR (measured) = 0.739 mW/g



0 dB = 0.739mW/g

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Secondary Landscape_GPRS850_CH189_Acon antenna

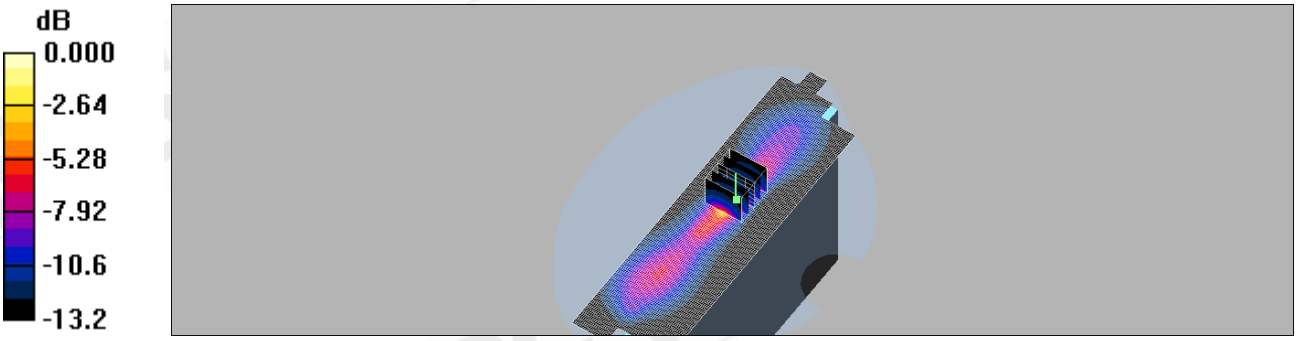
Communication System: GSM 850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.344 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 0.565 W/kg
SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.156 mW/g
Maximum value of SAR (measured) = 0.342 mW/g



0 dB = 0.342mW/g

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Front side _GPRS850_CH189_Acon antenna

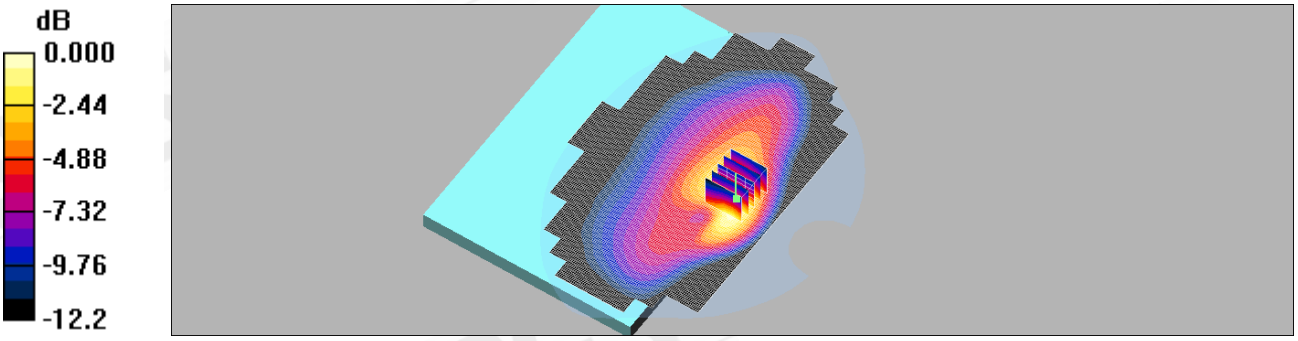
Communication System: GSM 850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.345 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.3 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 0.491 W/kg
SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.200 mW/g
Maximum value of SAR (measured) = 0.340 mW/g



0 dB = 0.340mW/g

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Lap-held GPRS 850 CH189_Acon antenna_ Full power

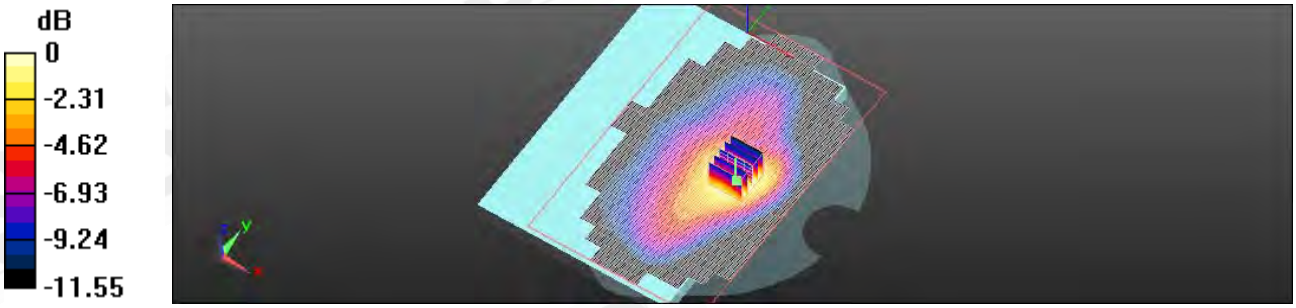
Communication System: GPRS(Class 10); Frequency: 836.4 MHz
Medium parameters used: f = 836.4 MHz; σ = 1.012 mho/m; ε_r = 53.831; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.668 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.427 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.942 W/kg

SAR(1 g) = 0.616 mW/g; SAR(10 g) = 0.398 mW/g
Maximum value of SAR (measured) = 0.662 mW/g



0 dB = 0.660mW/g

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Date: 9/02/2011

Secondary Landscape GPRS 850 CH189_Acon antenna_ Full power

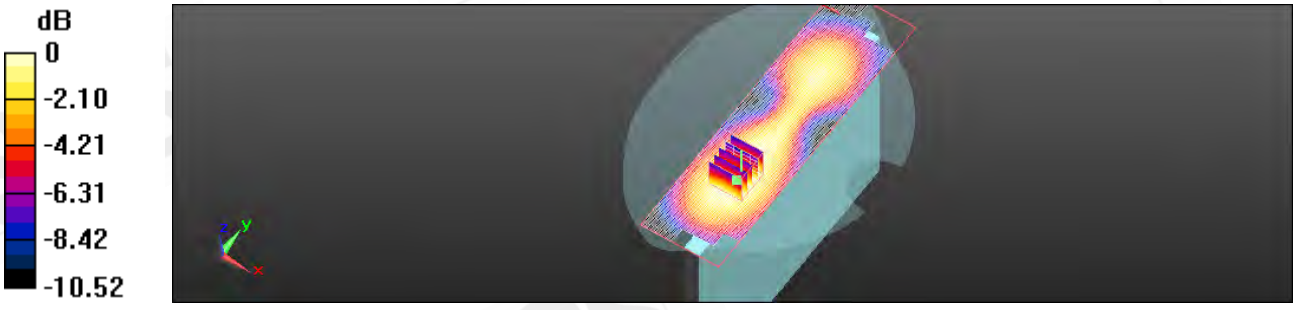
Communication System: GPRS(Class 10); Frequency: 836.4 MHz
Medium parameters used: f = 836.4 MHz; σ = 1.012 mho/m; ε_r = 53.831; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.320 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.369 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.398 W/kg

SAR(1 g) = 0.303 mW/g; SAR(10 g) = 0.221 mW/g
Maximum value of SAR (measured) = 0.321 mW/g



0 dB = 0.320mW/g

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Lap-held _GPRS1900_CH661_Acon antenna

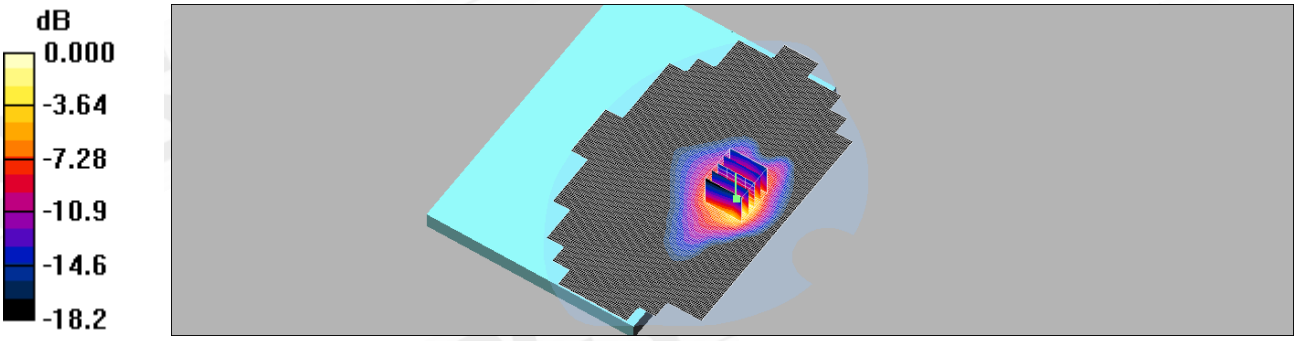
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.918 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = -0.133 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.789 mW/g; SAR(10 g) = 0.395 mW/g
Maximum value of SAR (measured) = 0.899 mW/g



0 dB = 0.899mW/g

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Secondary Landscape_GPRS1900_CH661_Acon antenna

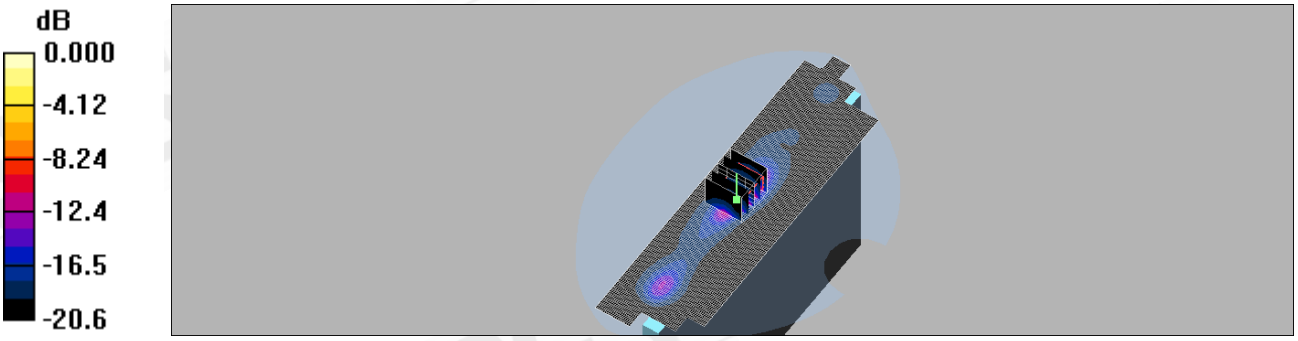
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.792 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.4 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.669 mW/g; SAR(10 g) = 0.315 mW/g
Maximum value of SAR (measured) = 0.762 mW/g



0 dB = 0.762mW/g

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Front side _GPRS1900_CH512_Acon antenna

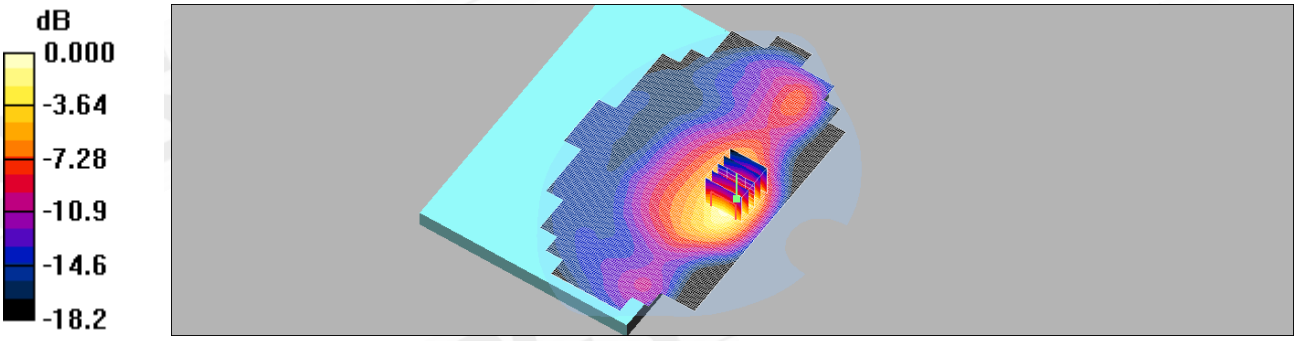
Communication System: GSM1900; Frequency: 1850.2 MHz;Duty Cycle: 1:4
Medium: M1800 & 1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.866 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.411 mW/g
Maximum value of SAR (measured) = 0.820 mW/g



0 dB = 0.820mW/g

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Front side _GPRS1900_CH661_Acon antenna

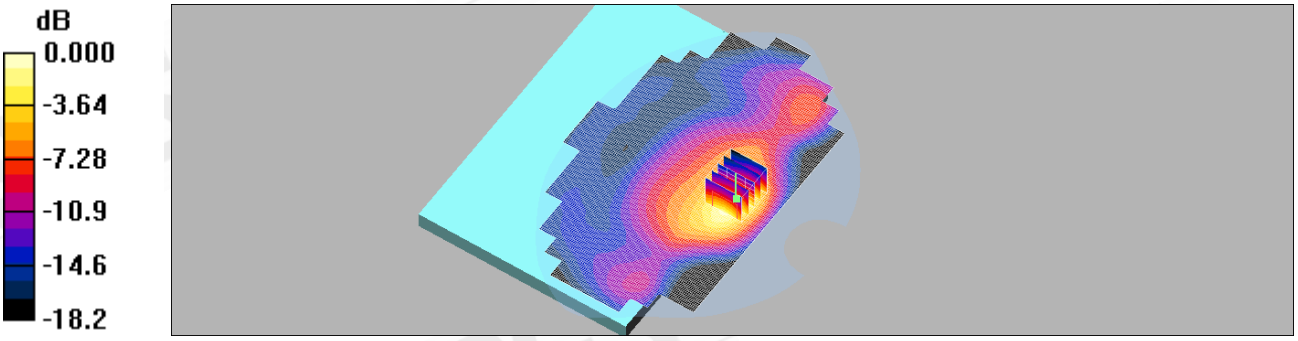
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = -0.049 dB
Peak SAR (extrapolated) = 1.59 W/kg
SAR(1 g) = 0.897 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 0.962 mW/g



0 dB = 0.962mW/g

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Front side _GPRS1900_CH810_Acon antenna

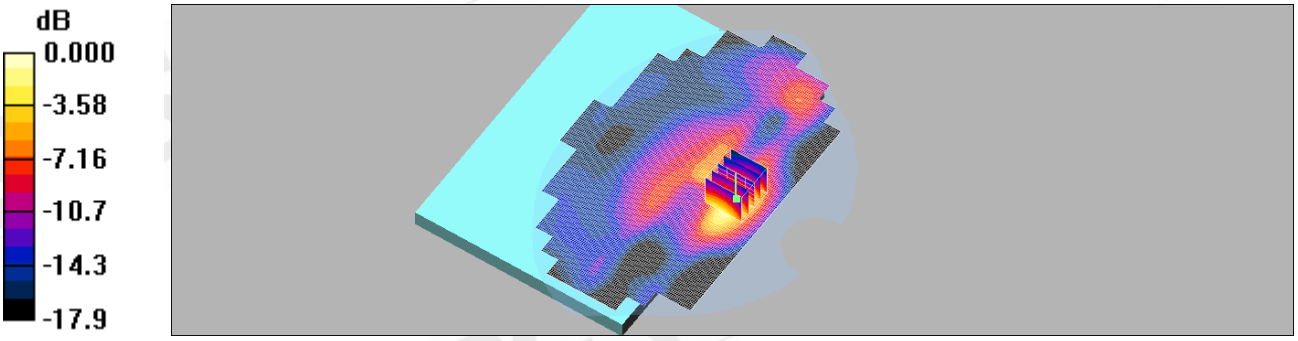
Communication System: GSM1900; Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: M1800 & 1900 Medium parameters used: f = 1910 MHz; σ = 1.59 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.5 V/m; Power Drift = -0.116 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.978 mW/g; SAR(10 g) = 0.540 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

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Lap-held GPRS 1900 CH661_Acon antenna_ Full power

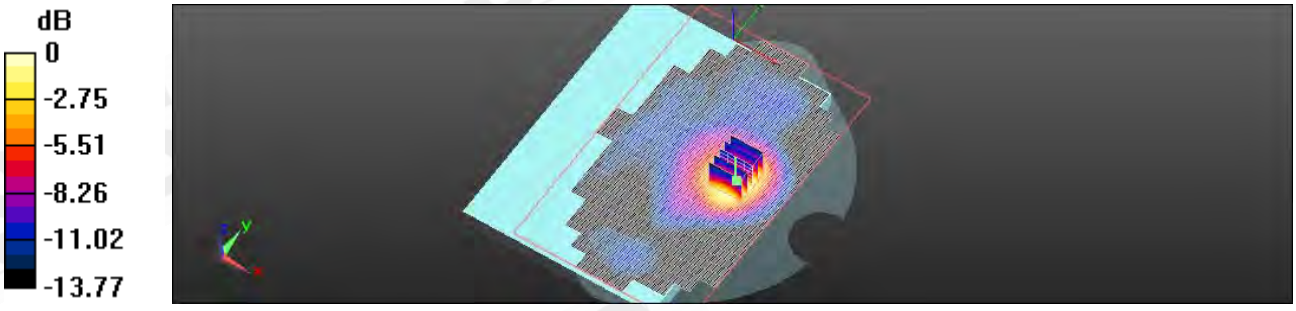
Communication System: GPRS(Class 10); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.499 mho/m; ε_r = 51.606; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.518 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.678 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.732 W/kg

SAR(1 g) = 0.453 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 0.490 mW/g



0 dB = 0.490mW/g

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Date: 9/02/2011

Secondary Landscape GPRS 1900 CH661_Acon antenna_ Full power

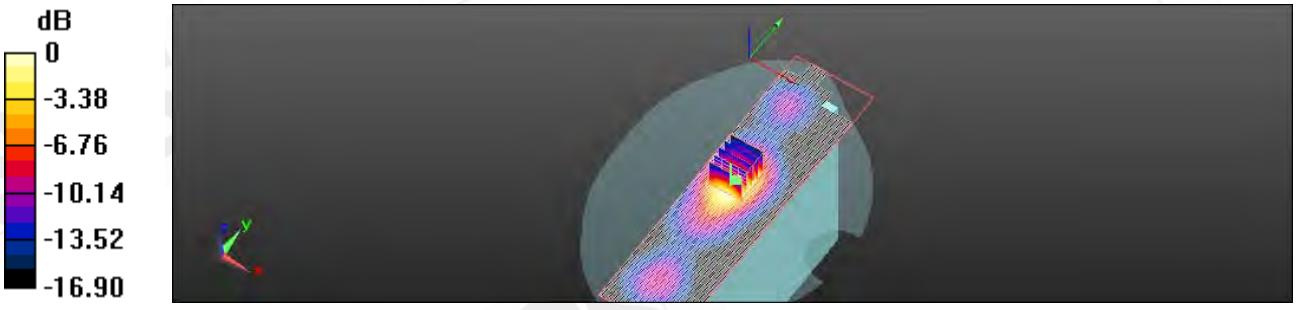
Communication System: GPRS(Class 10); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.499 mho/m; ε_r = 51.606; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.903 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.628 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.319 W/kg

SAR(1 g) = 0.797 mW/g; SAR(10 g) = 0.446 mW/g
Maximum value of SAR (measured) = 0.858 mW/g



0 dB = 0.860mW/g

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Lap-held _WCDMA Band II_CH9262_Acon antenna

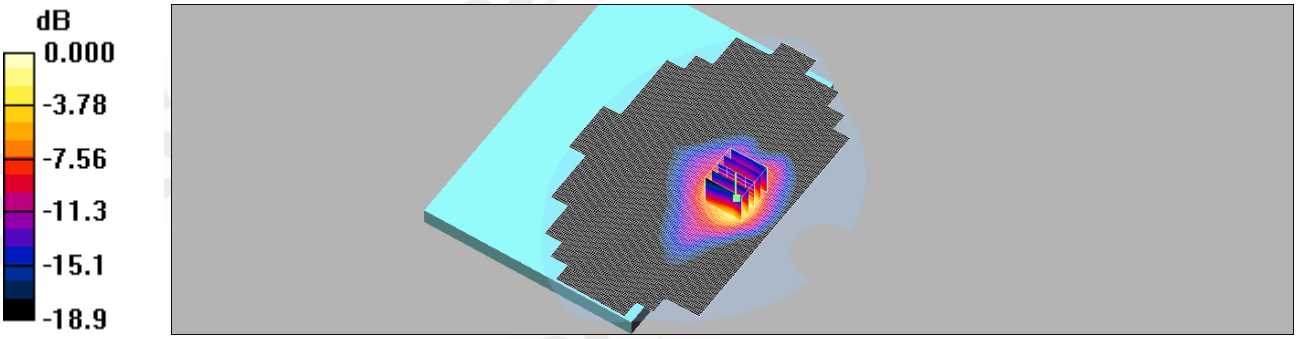
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.54 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.44 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 2.43 W/kg
SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.628 mW/g
Maximum value of SAR (measured) = 1.40 mW/g



0 dB = 1.40mW/g

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Lap-held _WCDMA Band II_CH9400_Acon antenna

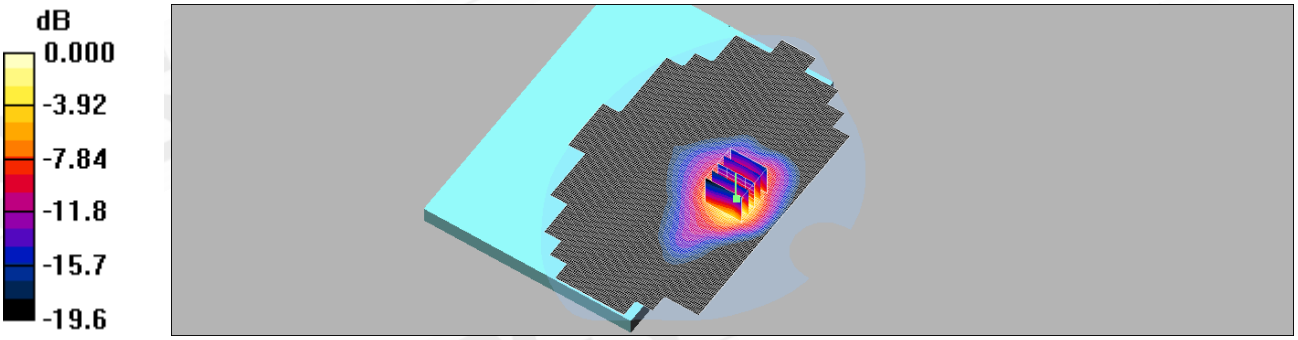
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.55 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 2.75 W/kg
SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.684 mW/g
Maximum value of SAR (measured) = 1.58 mW/g



0 dB = 1.58mW/g

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Lap-held _WCDMA Band II_CH9538_Acon antenna

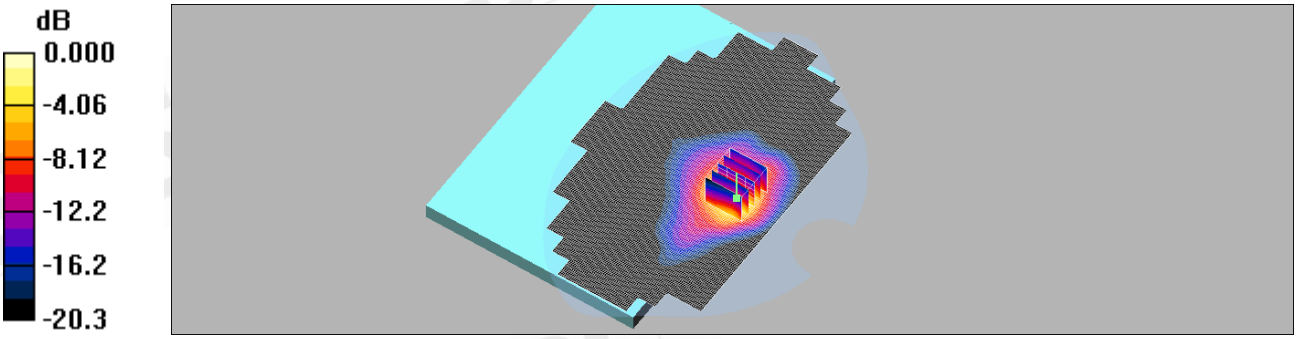
Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1908 MHz; σ = 1.59 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.51 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.0 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 2.76 W/kg
SAR(1 g) = 1.37 mW/g; SAR(10 g) = 0.668 mW/g
Maximum value of SAR (measured) = 1.56 mW/g



0 dB = 1.56mW/g

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Secondary Landscape_WCDMA Band II_CH9262_Acon antenna

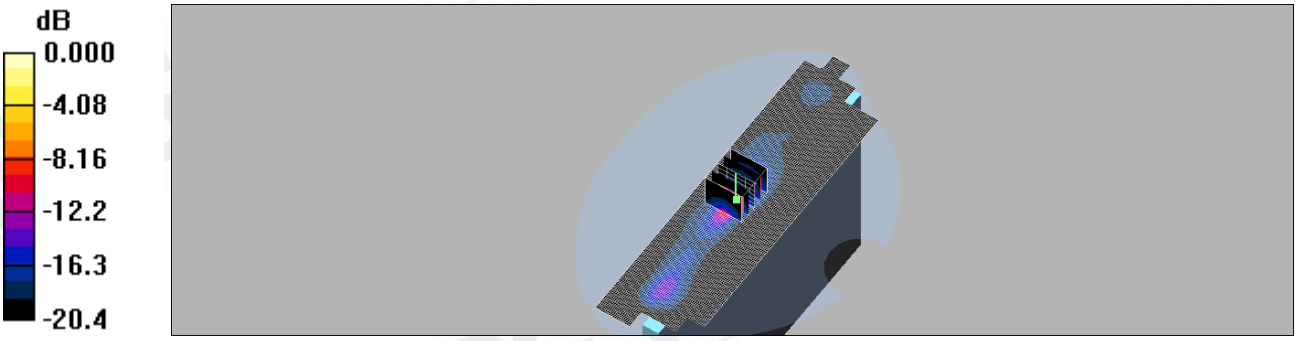
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.54 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.41 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.4 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 2.22 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.539 mW/g
Maximum value of SAR (measured) = 1.36 mW/g



0 dB = 1.36mW/g

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Secondary Landscape_WCDMA Band II_CH9400_Acon antenna

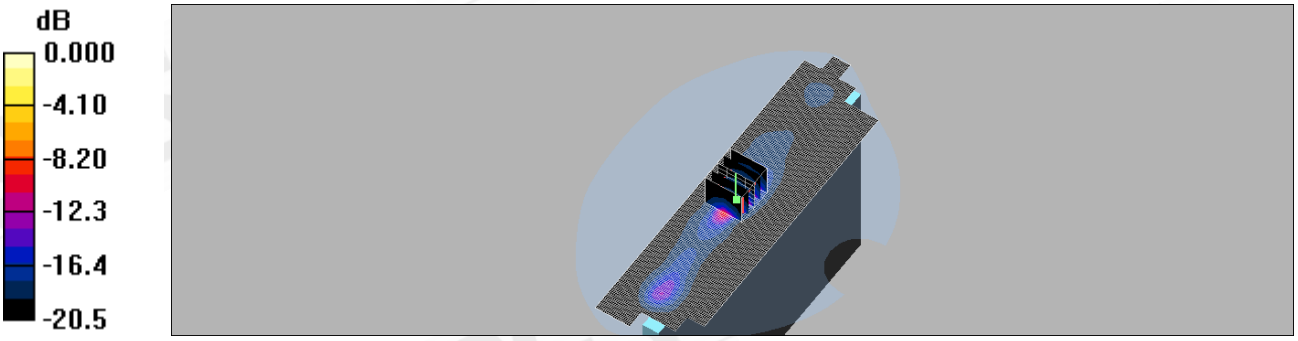
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.41 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.3 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 2.25 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.536 mW/g
Maximum value of SAR (measured) = 1.33 mW/g



0 dB = 1.33mW/g

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Secondary Landscape_WCDMA Band II_CH9538_Acon antenna

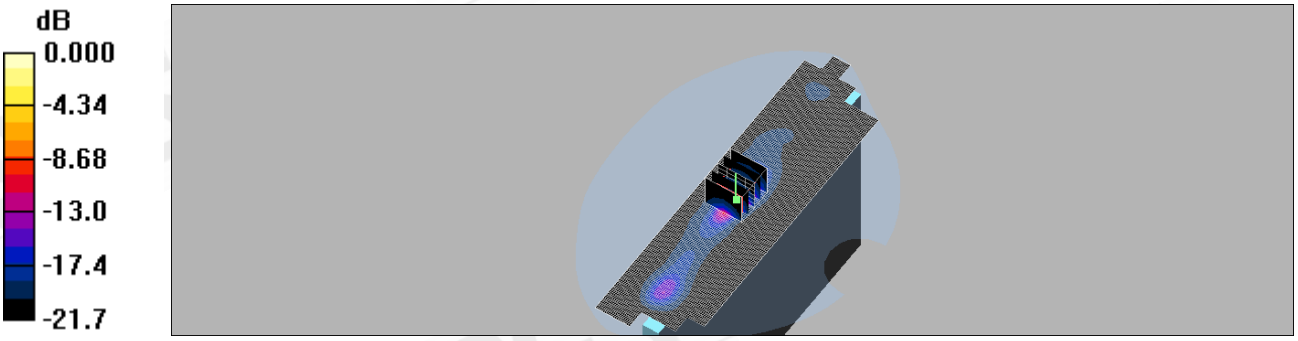
Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1908 MHz; σ = 1.59 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.36 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = -0.128 dB
Peak SAR (extrapolated) = 2.16 W/kg
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.518 mW/g
Maximum value of SAR (measured) = 1.33 mW/g



0 dB = 1.33mW/g

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Front side_WCDMA Band II_CH9262_Acon antenna

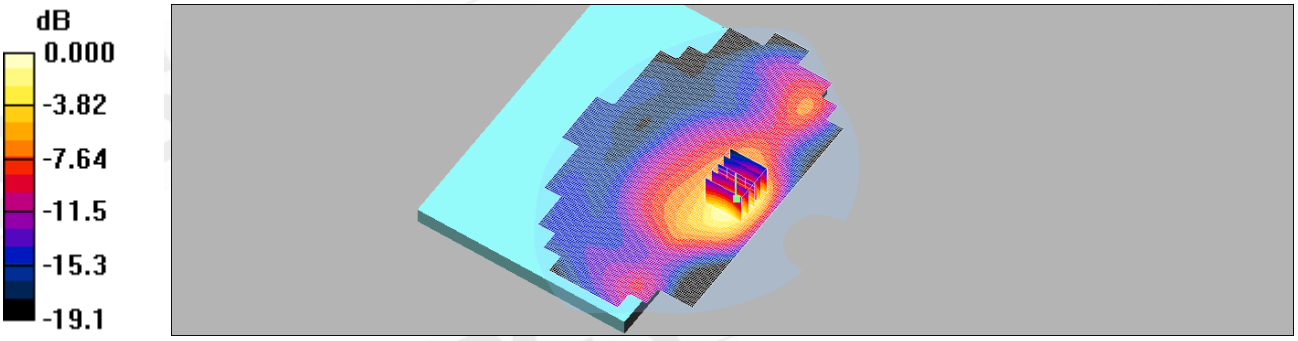
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.54 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.02 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.2 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.944 mW/g; SAR(10 g) = 0.522 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

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Front side_WCDMA Band II_CH9400_Acon antenna

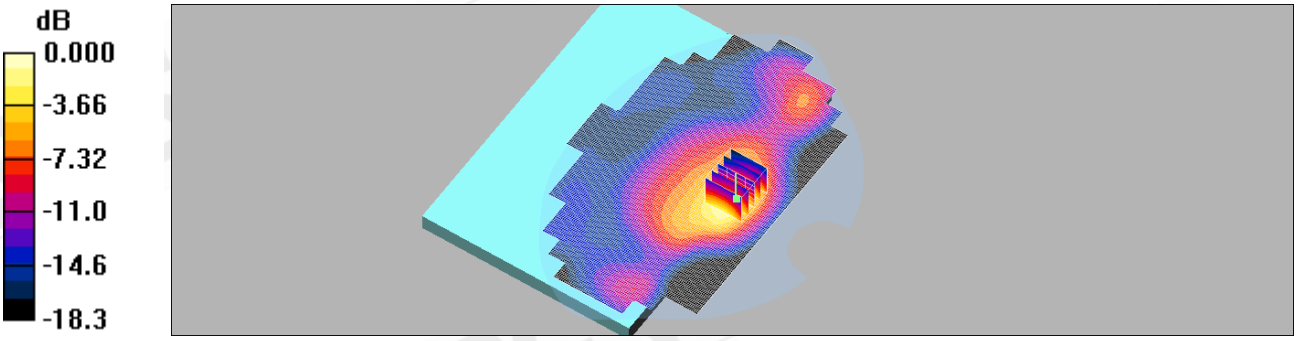
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.56 mho/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.12 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.968 mW/g; SAR(10 g) = 0.531 mW/g
Maximum value of SAR (measured) = 1.08 mW/g



0 dB = 1.08mW/g

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Front side_WCDMA Band II_CH9538_Acon antenna

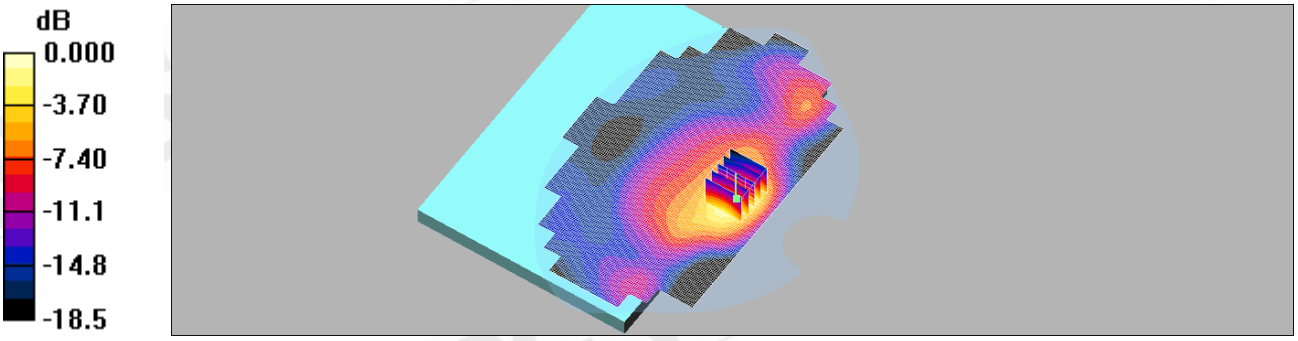
Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1908 MHz; σ = 1.59 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.06 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.544 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

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Lap-held WCDMA BAND II CH9400_Acon antenna_ Full power

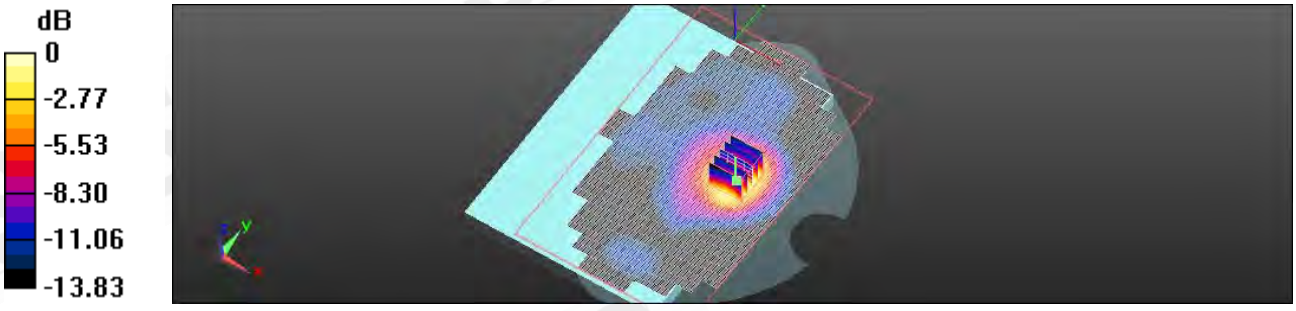
Communication System: WCDMA; Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.499 mho/m; ε_r = 51.606; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.655 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.569 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.931 W/kg

SAR(1 g) = 0.574 mW/g; SAR(10 g) = 0.338 mW/g
Maximum value of SAR (measured) = 0.623 mW/g



0 dB = 0.620mW/g

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Date: 9/02/2011

Secondary Landscape WCDMA BAND II CH9262_

Acon antenna_ Full power

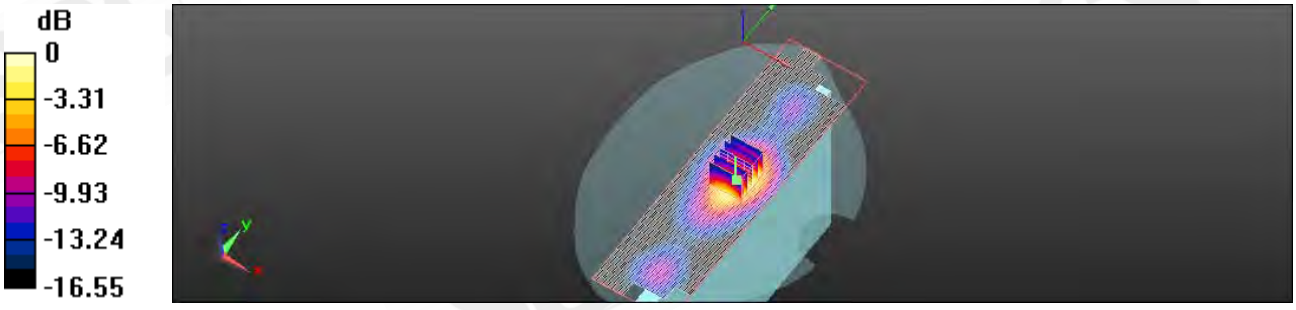
Communication System: WCDMA; Frequency: 1852.4 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.468 mho/m; ε_r = 51.665; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.215 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.890 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.792 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.596 mW/g
Maximum value of SAR (measured) = 1.160 mW/g



0 dB = 1.160mW/g

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Date: 9/02/2011

Secondary Landscape WCDMA BAND II CH9400_

Acon antenna_ Full power

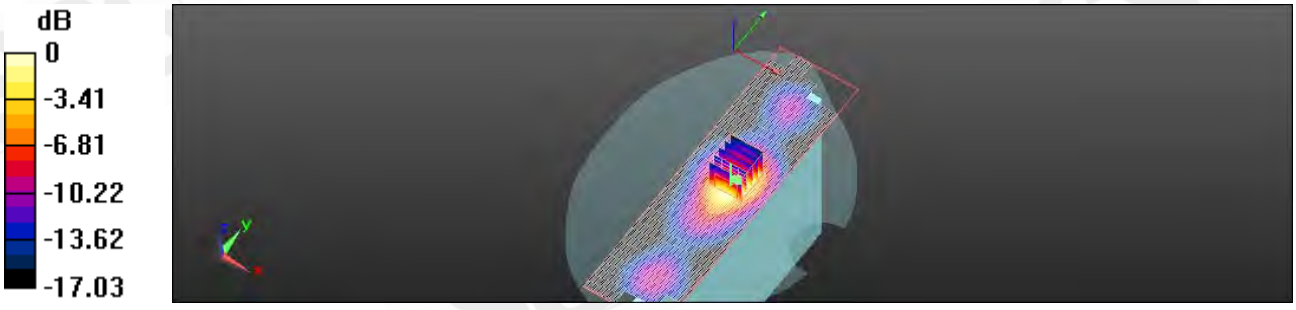
Communication System: WCDMA; Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.499 mho/m; ε_r = 51.606; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.117 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.975 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.663 W/kg

SAR(1 g) = 0.989 mW/g; SAR(10 g) = 0.552 mW/g
Maximum value of SAR (measured) = 1.070 mW/g



0 dB = 1.070mW/g

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Date: 9/02/2011

Secondary Landscape WCDMA BAND II CH9538_

Acon antenna_ Full power

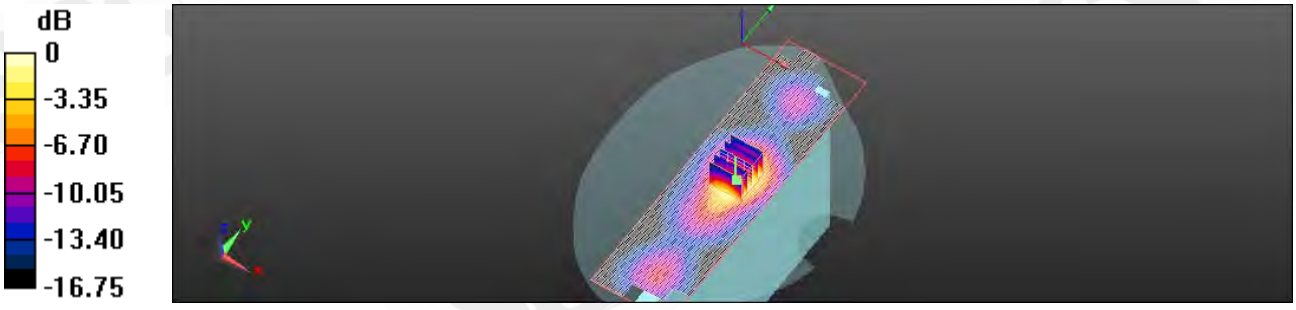
Communication System: WCDMA; Frequency: 1907.6 MHz
Medium parameters used: f = 1908 MHz; σ = 1.533 mho/m; ε_r = 51.518; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.002 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.046 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.513 W/kg

SAR(1 g) = 0.891 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 0.968 mW/g



0 dB = 0.970mW/g

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Lap-held _WCDMA Band V_CH4132_Acon antenna

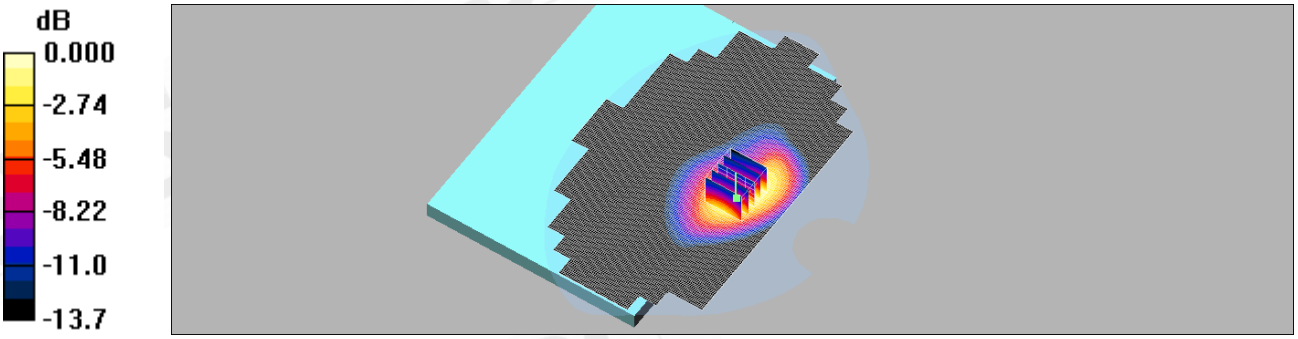
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used (interpolated): f = 826.4 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.10 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.9 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 1.83 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

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Lap-held _WCDMA Band V_CH4182_Acon antenna

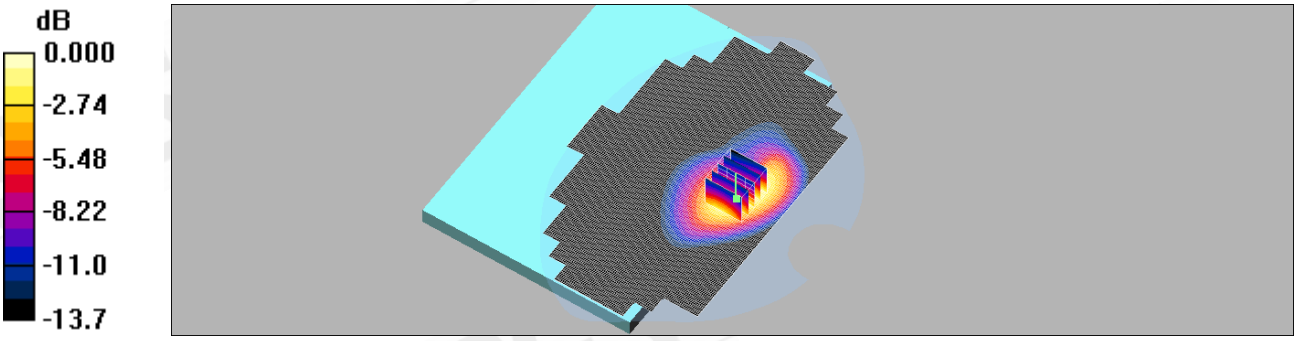
Communication System: WCDMA Band V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.11 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.2 V/m; Power Drift = -0.098 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.584 mW/g
Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

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Lap-held _WCDMA Band V_CH4233_Acon antenna

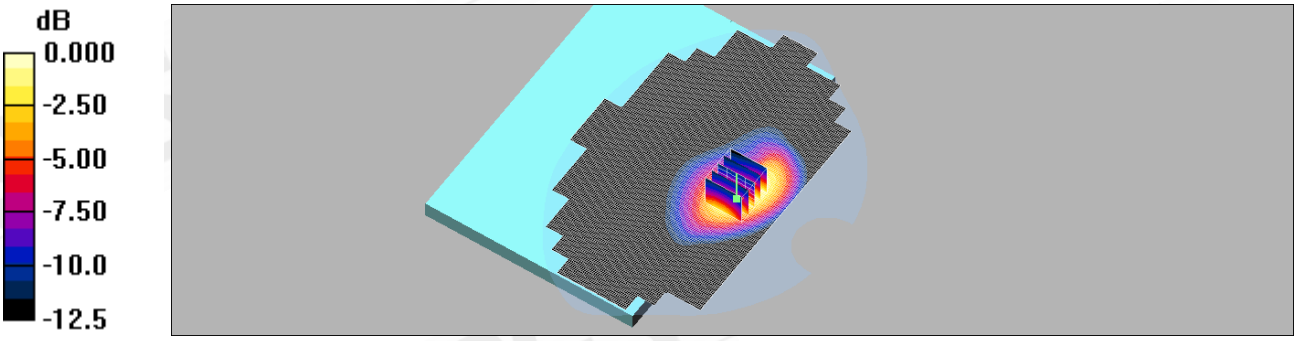
Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 847 MHz; σ = 1.03 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.0 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 0.980 mW/g; SAR(10 g) = 0.567 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

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Secondary Landscape_WCDMA Band V_CH4182_Acon antenna

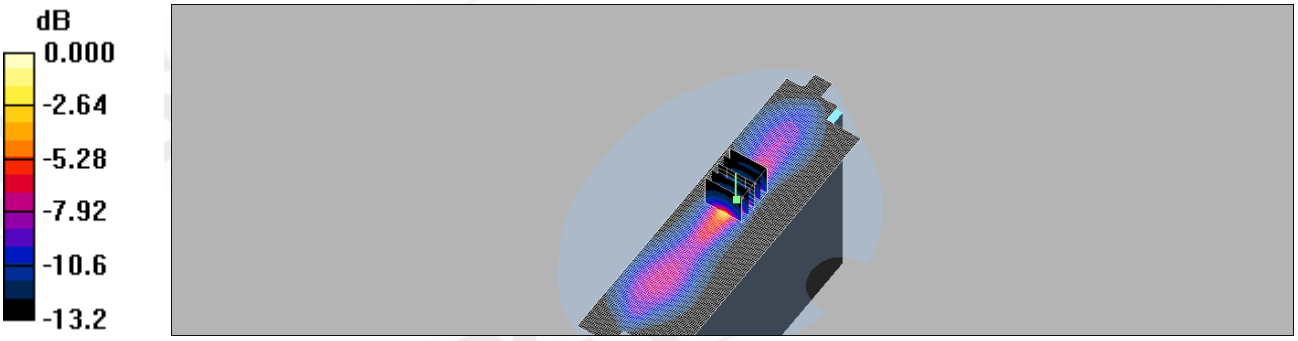
Communication System: WCDMA Band V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.495 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.1 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 0.805 W/kg
SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.220 mW/g
Maximum value of SAR (measured) = 0.486 mW/g



0 dB = 0.486mW/g

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Front side _WCDMA Band V_CH4182_Acon antenna

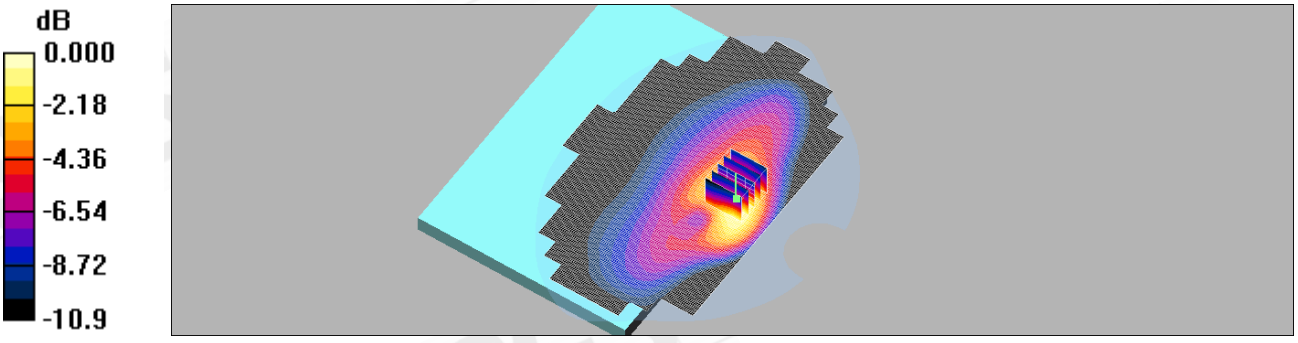
Communication System: WCDMA Band V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.367 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.034 dB
Peak SAR (extrapolated) = 0.515 W/kg
SAR(1 g) = 0.331 mW/g; SAR(10 g) = 0.212 mW/g
Maximum value of SAR (measured) = 0.356 mW/g



0 dB = 0.356mW/g

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Lap-heldWCDMA Band V CH4182_Acon antenna_ Full power

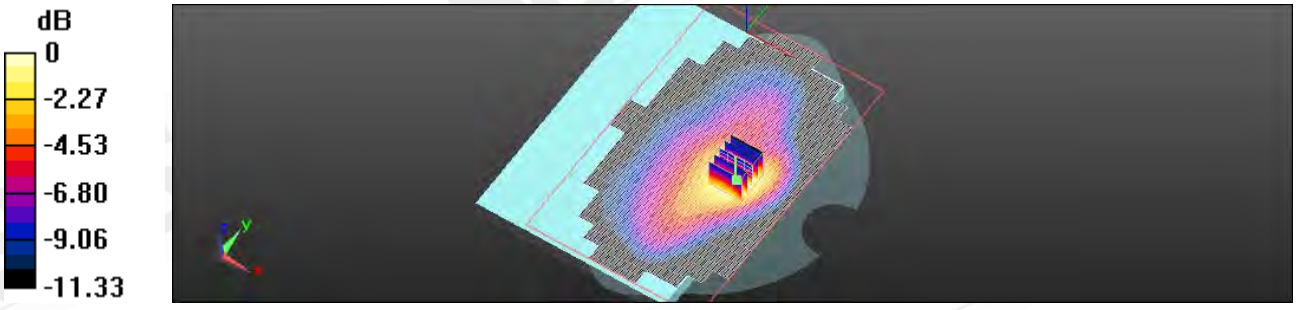
Communication System: WCDMA; Frequency: 836.4 MHz
Medium parameters used: f = 836.4 MHz; σ = 1.012 mho/m; ε_r = 53.831; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.506 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.472 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.703 W/kg

SAR(1 g) = 0.462 mW/g; SAR(10 g) = 0.299 mW/g
Maximum value of SAR (measured) = 0.496 mW/g



0 dB = 0.500mW/g

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Date: 9/02/2011

Secondary LandscapeWCDMA Band V CH4182_Acon antenna_ Full power

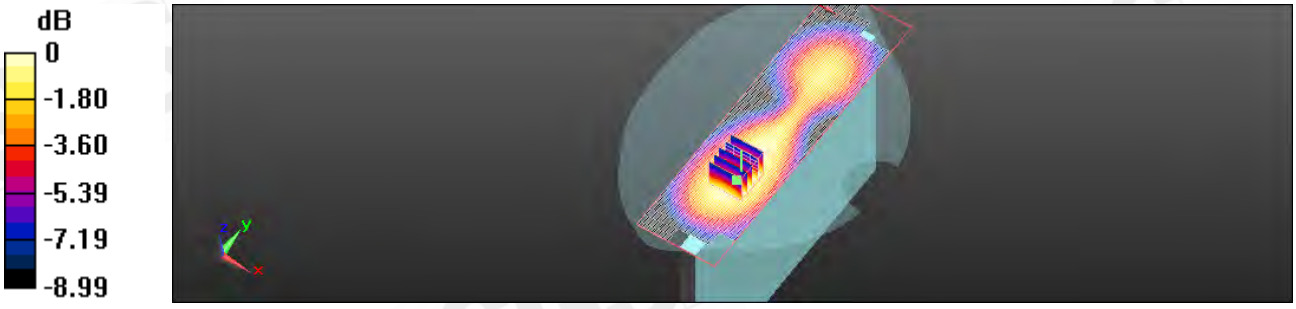
Communication System: WCDMA; Frequency: 836.4 MHz
Medium parameters used: f = 836.4 MHz; σ = 1.012 mho/m; ε_r = 53.831; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/Body/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.341 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.569 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.472 W/kg

SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.211 mW/g
Maximum value of SAR (measured) = 0.323 mW/g



0 dB = 0.330mW/g

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Lap-held _GPRS850_CH128_Wahyu antenna

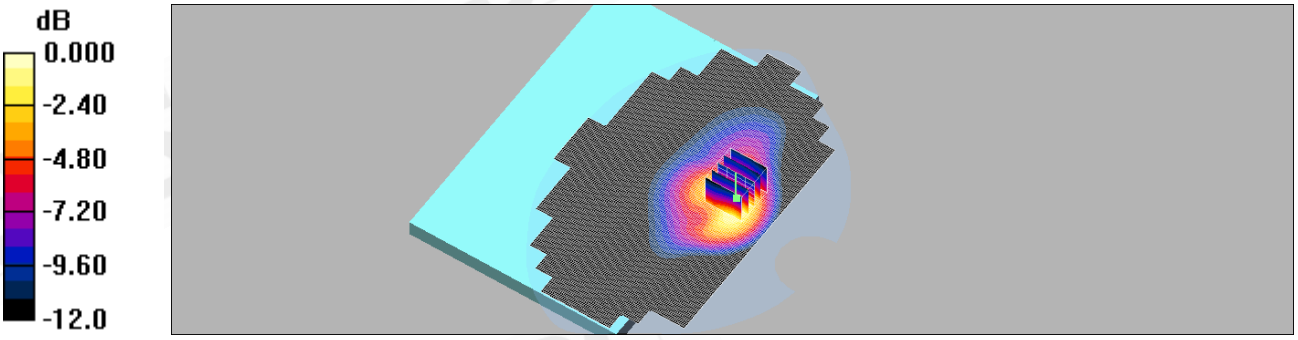
Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4
Medium: Muscle 900 MHz Medium parameters used (interpolated): f = 824.2 MHz; σ = 1.01 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.650 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 0.978 W/kg
SAR(1 g) = 0.576 mW/g; SAR(10 g) = 0.344 mW/g
Maximum value of SAR (measured) = 0.622 mW/g



0 dB = 0.622mW/g

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Front side _GPRS1900_CH810_Wahyu antenna

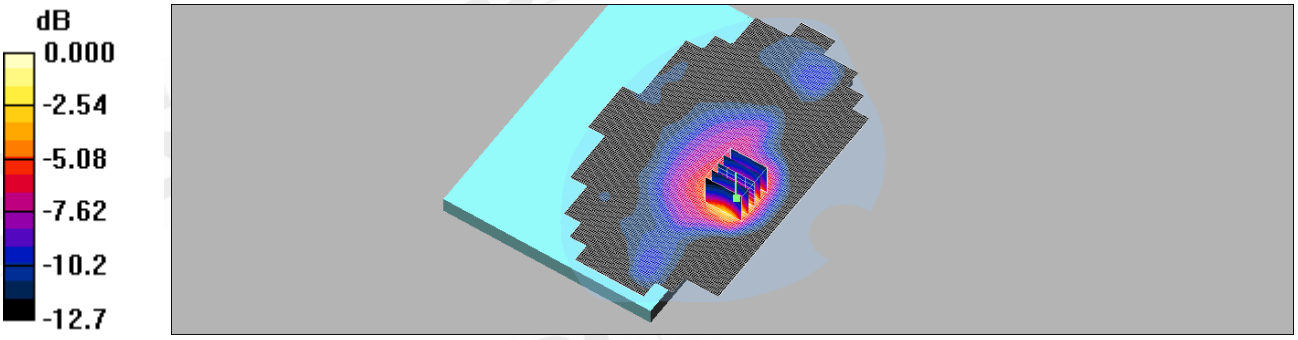
Communication System: GSM1900; Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: M1800 & 1900 Medium parameters used: f = 1910 MHz; σ = 1.59 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.291 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.19 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 0.449 W/kg
SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.286 mW/g



0 dB = 0.286mW/g

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Lap-held _WCDMA Band II_CH9400_Wahyu antenna

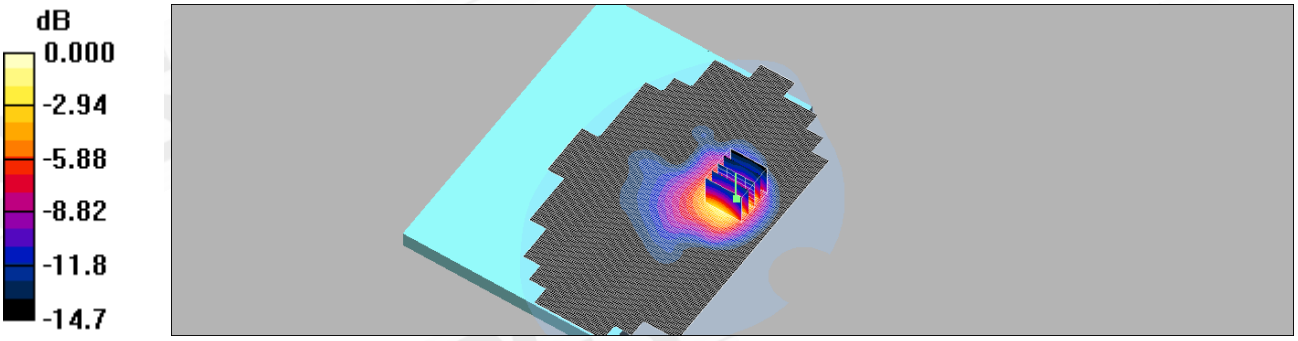
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.07 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.5 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 1.67 W/kg
SAR(1 g) = 0.893 mW/g; SAR(10 g) = 0.474 mW/g
Maximum value of SAR (measured) = 0.991 mW/g



0 dB = 0.991mW/g

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Lap-held _WCDMA Band V_CH4182_Wahyu antenna

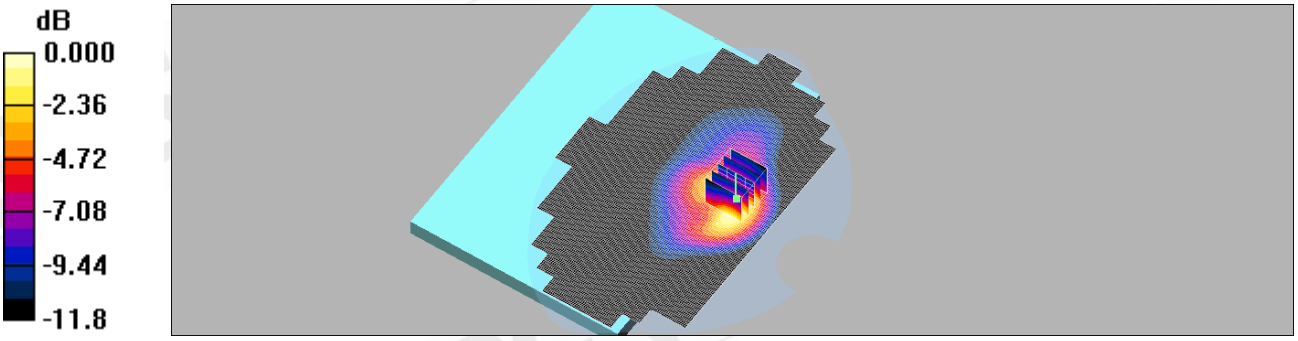
Communication System: WCDMA Band V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 837 MHz; σ = 1.02 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

body/Area Scan (111x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.667 mW/g

body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.996 W/kg
SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.351 mW/g
Maximum value of SAR (measured) = 0.634 mW/g



0 dB = 0.634mW/g

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5. SAR System Performance Verification

Date: 2011/7/24

DUT: Dipole 835 MHz;

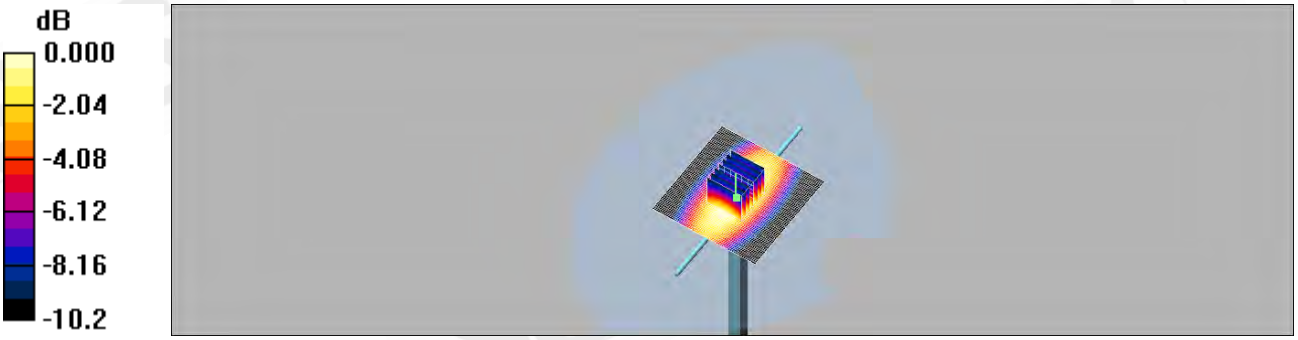
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 835 MHz; σ = 1.02 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.61 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.5 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 3.54 W/kg
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.58 mW/g
Maximum value of SAR (measured) = 2.58 mW/g



0 dB = 2.58mW/g

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DUT: Dipole 1900 MHz;

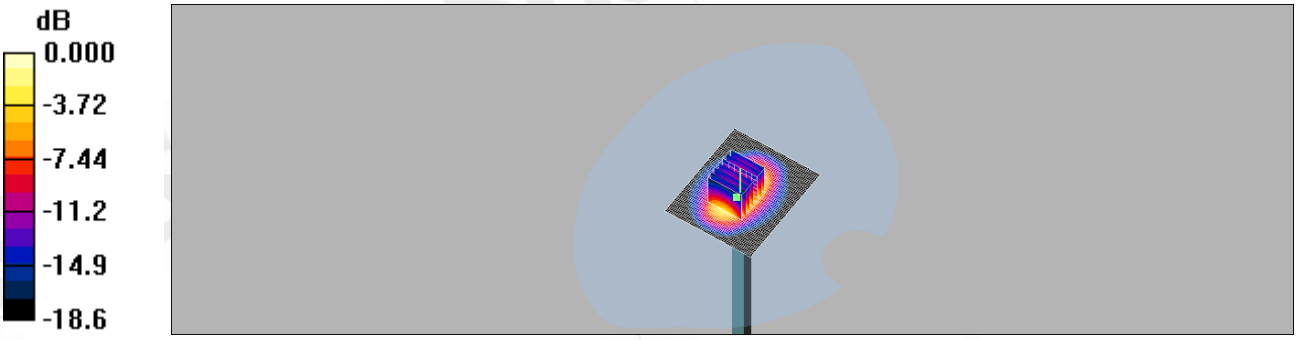
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1900 MHz; σ = 1.59 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.0 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.9 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 9.94 mW/g; SAR(10 g) = 5.09 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

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DUT: Dipole 835 MHz;

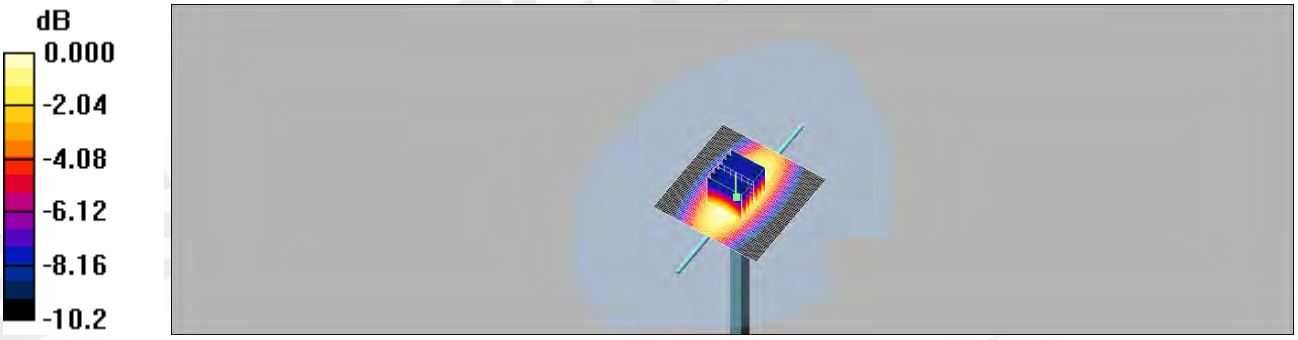
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: f = 835 MHz; σ = 1.02 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.63 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.9 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.59 mW/g
Maximum value of SAR (measured) = 2.61 mW/g



0 dB = 2.61mW/g

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DUT: Dipole 1900 MHz;

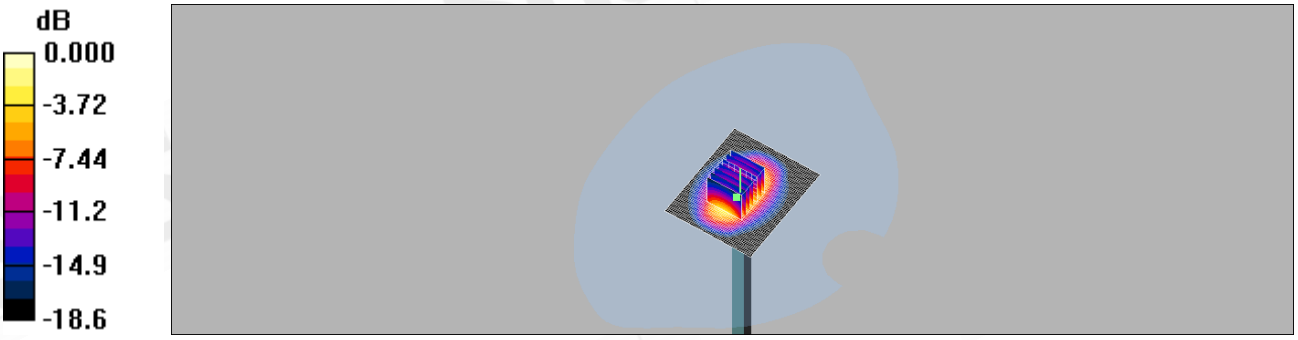
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: f = 1900 MHz; σ = 1.58 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 2011/4/19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.1 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.3 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 9.99 mW/g; SAR(10 g) = 5.14 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

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Date: 5/23/2011

DUT: Dipole 835 MHz;

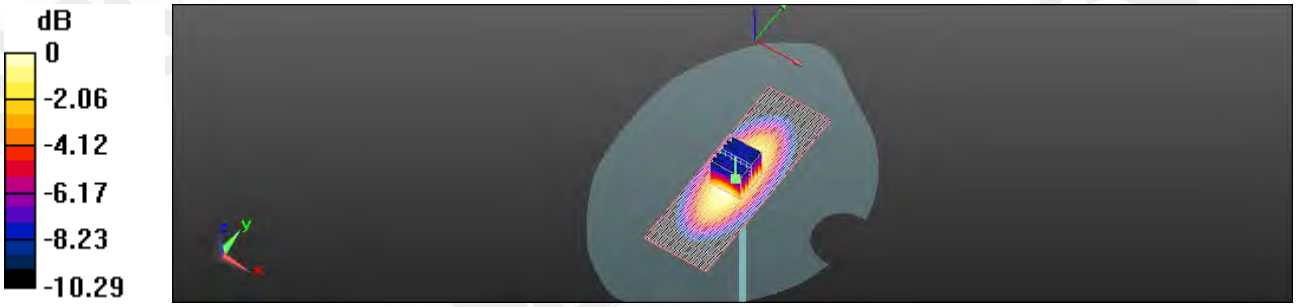
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 53.847; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/d=15mm, Pin=250mW, dist=4mm: Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.656 mW/g

Configuration/d=15mm, Pin=250mW, dist=4mm: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.852 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.632 W/kg

SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.647 mW/g



0 dB = 2.650mW/g

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Date: 5/23/2011

DUT: Dipole 1900 MHz;

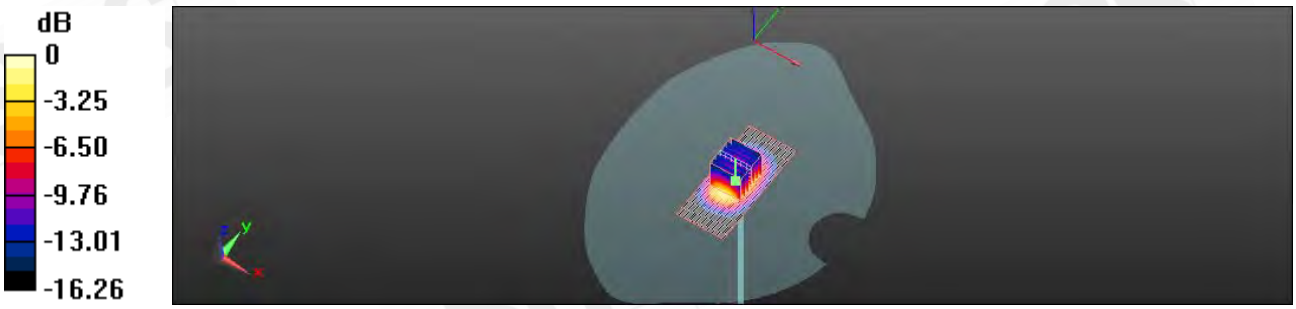
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.523 mho/m; ε_r = 51.545; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/d=10mm, Pin=250mW, dist=4mm: Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.810 mW/g

Configuration/d=10mm, Pin=250mW, dist=4mm: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.845 V/m; Power Drift = 0.0024 dB
Peak SAR (extrapolated) = 16.549 W/kg

SAR(1 g) = 9.6 mW/g; SAR(10 g) = 5.12 mW/g
Maximum value of SAR (measured) = 10.924 mW/g



0 dB = 10.920mW/g

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DUT: Dipole 835 MHz;

Date: 9/02/2011

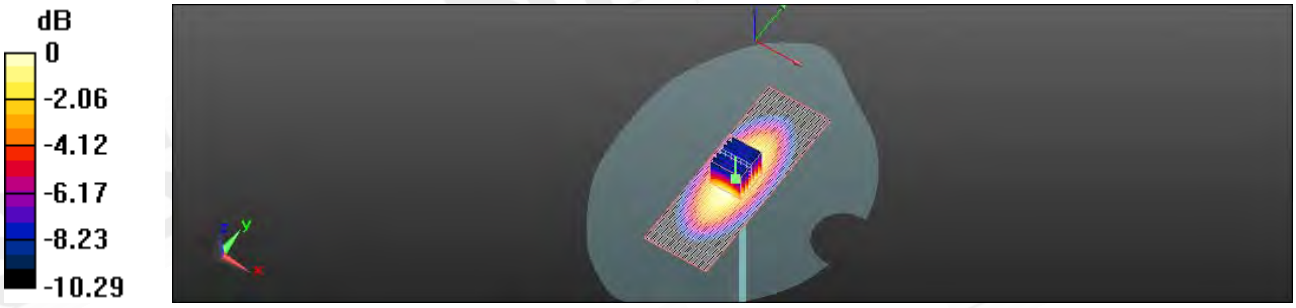
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 53.847; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.3, 9.3, 9.3); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM1; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/d=15mm, Pin=250mW, dist=4mm: Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.656 mW/g

Configuration/d=15mm, Pin=250mW, dist=4mm: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.852 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.632 W/kg

SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.647 mW/g



0 dB = 2.650mW/g

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DUT: Dipole 1900 MHz;

Date: 9/02/2011

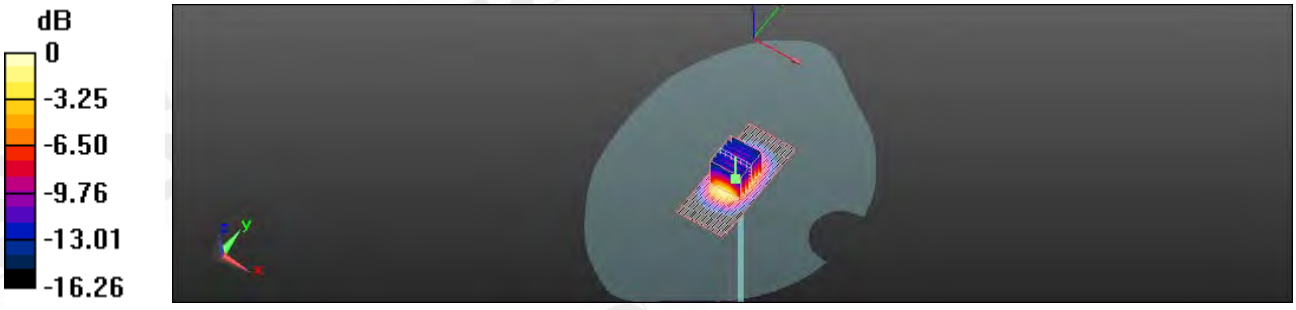
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.523 mho/m; ε_r = 51.545; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.51, 7.51, 7.51); Calibrated: 4/19/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 5/18/2011
- Phantom: SAM2; Type: SAM
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Configuration/d=10mm, Pin=250mW, dist=4mm: Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.810 mW/g

Configuration/d=10mm, Pin=250mW, dist=4mm: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.845 V/m; Power Drift = 0.0024 dB
Peak SAR (extrapolated) = 16.549 W/kg

SAR(1 g) = 9.7 mW/g; SAR(10 g) = 5.12 mW/g
Maximum value of SAR (measured) = 10.924 mW/g



0 dB = 10.920mW/g

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6. DAE & Probe Calibration certificate

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Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S 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

Accreditation No.: SCS 108

Client SGS-TW

Certificate No: DAE4-547_Aug10

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 547
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	August 18, 2010

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	1-Oct-09 (No: 9055)	Oct-10
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	R&D Director	i.V.

Issued: August 18, 2010

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Certificate No: DAE4-547_Aug10 Page 1 of 5

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: DAE4-856_May11

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 856
Calibration procedure(s)	QA CAL-06.v23 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	May 18, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: May 18, 2011

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Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: EX3-3770_Apr11

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3770

Calibration procedure(s) QA CAL-01.v7, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v3
Calibration procedure for dosimetric E-field probes

Calibration date: April 19, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41495277	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	23-Apr-10 (No. DAE4-654_Apr10)	Apr-11
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: April 19, 2011

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
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 ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-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 characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z* are numerical linearization parameters in dB assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media.
- *VR:* VR is the validity range of the calibration related to the average diode voltage or DAE voltage in mV.
- *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 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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Probe EX3DV4

SN:3770

Manufactured: July 6, 2010
Calibrated: April 19, 2011

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.32	0.62	0.40	± 10.1 %
DCP (mV)[B]	106.6	98.3	102.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	120.8	±2.7 %
			Y	0.00	0.00	1.00	134.3	
			Z	0.00	0.00	1.00	133.5	

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%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] 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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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	9.58	9.58	9.58	0.80	0.70	± 12.0 %
835	41.5	0.90	9.25	9.25	9.25	0.80	0.67	± 12.0 %
900	41.5	0.97	9.06	9.06	9.06	0.76	0.71	± 12.0 %
1750	40.1	1.37	7.97	7.97	7.97	0.80	0.61	± 12.0 %
1900	40.0	1.40	7.78	7.78	7.78	0.71	0.62	± 12.0 %
2000	40.0	1.40	7.79	7.79	7.79	0.75	0.58	± 12.0 %
2450	39.2	1.80	6.99	6.99	6.99	0.80	0.56	± 12.0 %
2600	39.0	1.96	6.95	6.95	6.95	0.66	0.62	± 12.0 %

[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.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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DASY/EASY - Parameters of Probe: EX3DV4- SN:3770

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	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.42	9.42	9.42	0.73	0.72	± 12.0 %
835	55.2	0.97	9.30	9.30	9.30	0.72	0.72	± 12.0 %
900	55.0	1.05	9.12	9.12	9.12	0.73	0.75	± 12.0 %
1750	53.4	1.49	7.84	7.84	7.84	0.80	0.68	± 12.0 %
1900	53.3	1.52	7.51	7.51	7.51	0.80	0.62	± 12.0 %
2000	53.3	1.52	7.44	7.44	7.44	0.80	0.66	± 12.0 %
2450	52.7	1.95	6.96	6.96	6.96	0.80	0.50	± 12.0 %
2600	52.5	2.16	6.78	6.78	6.78	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.42	4.42	4.42	0.50	1.90	± 13.1 %
5300	48.9	5.42	4.12	4.12	4.12	0.52	1.90	± 13.1 %
5600	48.5	5.77	3.54	3.54	3.54	0.60	1.90	± 13.1 %
5800	48.2	6.00	3.80	3.80	3.80	0.60	1.90	± 13.1 %

[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.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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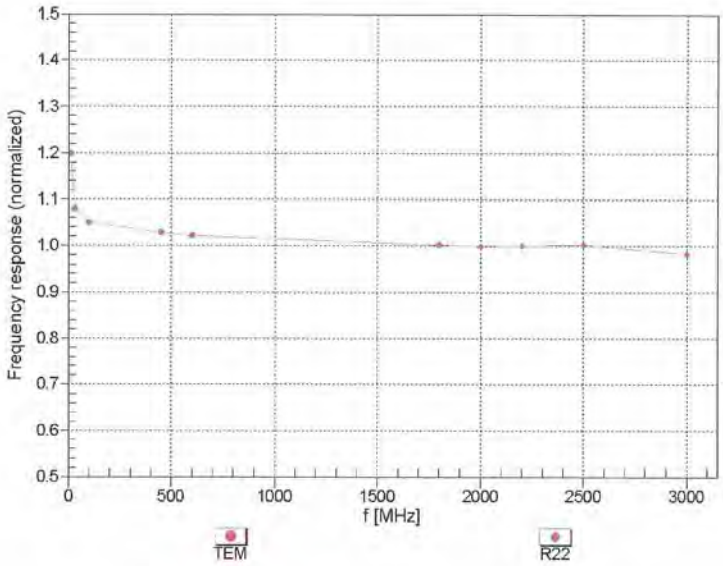
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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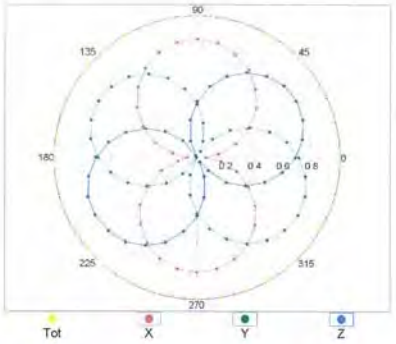
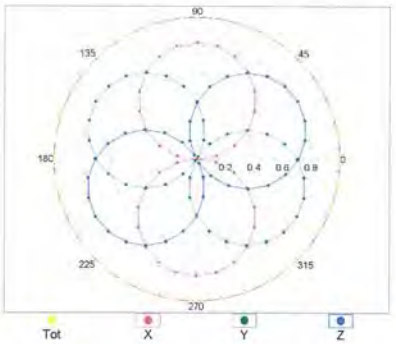
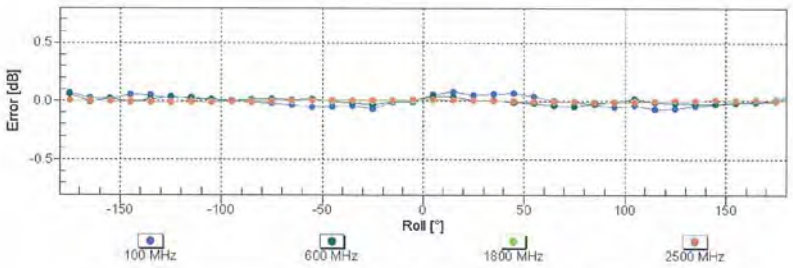
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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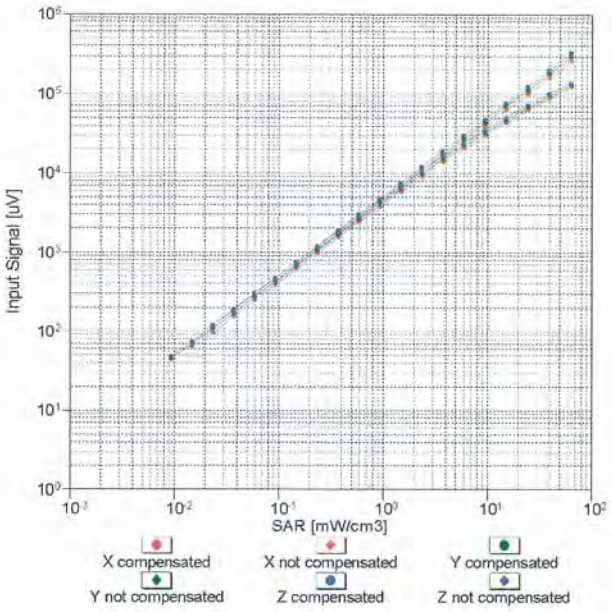
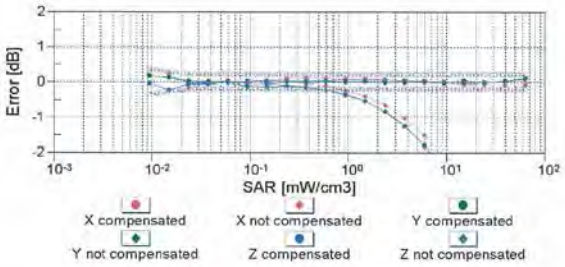
Dynamic Range f(SAR$_{head}$)
(TEM cell , f = 900 MHz)





Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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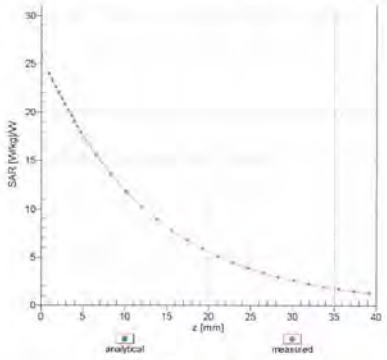
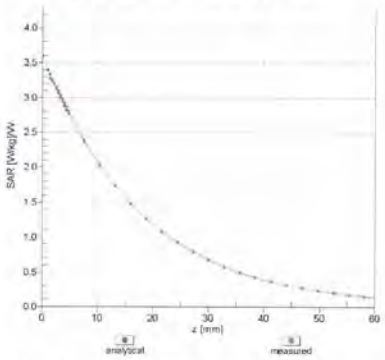
Conversion Factor Assessment

f = 1750 MHz,WGLS R22 (H_convF)

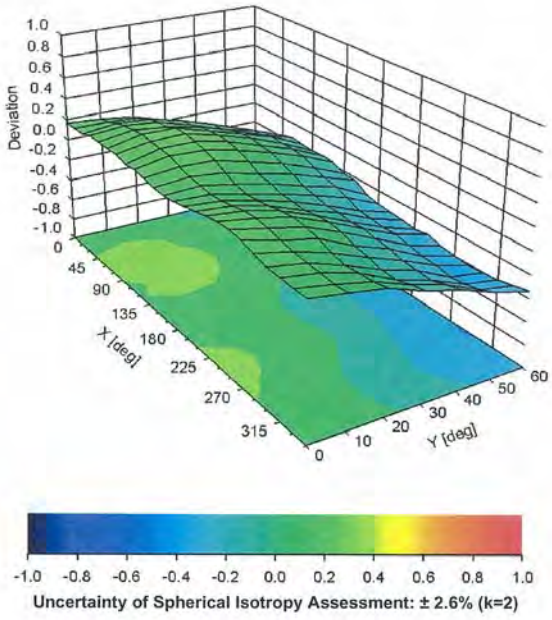


f = 900 MHz,WGLS R9 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3770

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
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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7. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test								
IEEE 1528								
A	c	D	e	f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty %	Probability Distributioin	Div	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system								
Probe calibration (Frequency below 2GMHz)	6%(12.0/2)	N	1	1	1	6%	6%	∞
Isotropy , Axial	4.7%	R	$\sqrt{3}$	1	1	2.7%	2.7%	∞
Isotropy, Hemispherical	9.6%	R	$\sqrt{3}$	1	1	5.5%	5.5%	∞
Boundary Effect	1.0%	R	$\sqrt{3}$	1	1	0.6%	0.6%	∞
Linearity	4.7%	R	$\sqrt{3}$	1	1	2.7%	2.7%	∞
Detection Limits	1.0%	R	$\sqrt{3}$	1	1	0.6%	0.6%	∞
Readout Electronics	0.3%	N	1	1	1	0.3%	0.3%	∞
Response time	0.8%	R	$\sqrt{3}$	1	1	0.5%	0.5%	∞
Integration Time	2.6%	R	$\sqrt{3}$	1	1	1.5%	1.5%	∞
Measurement drift	1.8%	R	$\sqrt{}$	1	1	1.0%	1.0%	∞

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(class A evaluation)			3					
RF ambient condition - noise	3.0%	R	√3	1	1	1.7%	1.7%	∞
RF ambient conditions -reflections	3.0%	R	√3	1	1	1.7%	1.7%	∞
Probe positioner Mechanical restrictions	0.4%	R	√3	1	1	0.2%	0.2%	∞
Probe Positioning with respect to phantom shell	2.9%	R	√3	1	1	1.7%	1.7%	∞
Post-processing	1.0%	R	√3	1	1	0.6%	0.6%	∞
Max SAR Eval	1.0%	R	√3	1	1	0.6%	0.6%	∞
Test Sample related								
Test sample positioning	2.9%	N	1	1	1	2.9%	2.9%	M-1
Device Holder Uncertainty	3.6%	N	1	1	1	3.6%	3.6%	M-1
Drift of output power	5.0%	R	√3	1	1	2.9%	2.9%	∞
Phantom and Setup								
Phantom Uncertainty	4.0%	R	√3	1	1	2.3%	2.3%	∞
Liquid conductivity(meas.) Max at 1900 band	4.6%	N	1	0.64	0.43	2.9%	2.0%	M

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Liquid permitivity(meas.) Max at 835 band	2.2%	N	1	0.6	0.49	1.3%	1.1%	M
Combined standard uncertainty		RSS				11.8%	11.6%	
Expant uncertainty (95% confidence interval), K=2						23.6%	23.2%	

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8. Phantom Description

Schmid & Partner Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 C
Series No	TP-1150 and higher
Manufacturer	SPEAG Zeughausstrasse 43 CH-8004 Zürich Switzerland

Tests
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 ff.
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 liquids	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
[1] CENELEC EN 50361
[2] IEEE Std 1528-2003
[3] IEC 62209 Part I
[4] FCC OET 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].

Date 07.07.2005

Signature / Stamp

Schmid & Partner Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

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9. System Validation from Original equipment supplier

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S 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

Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: D835V2-4d063_May11

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d063
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	May 25, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 25, 2011

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

Certificate No: D835V2-4d063_May11 Page 1 of 8

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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

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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

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) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
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) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

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.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
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	40.4 ± 6 %	0.88 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	2.31 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.34 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.13 mW /g ± 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	53.9 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.43 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.45 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.27 mW / g ± 16.5 % (k=2)**

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Member of SGS Group

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.4 Ω - 1.5 jΩ
Return Loss	- 28.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.7 Ω - 4.1 jΩ
Return Loss	- 27.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.426 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.
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	November 27, 2006

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DASY5 Validation Report for Head TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

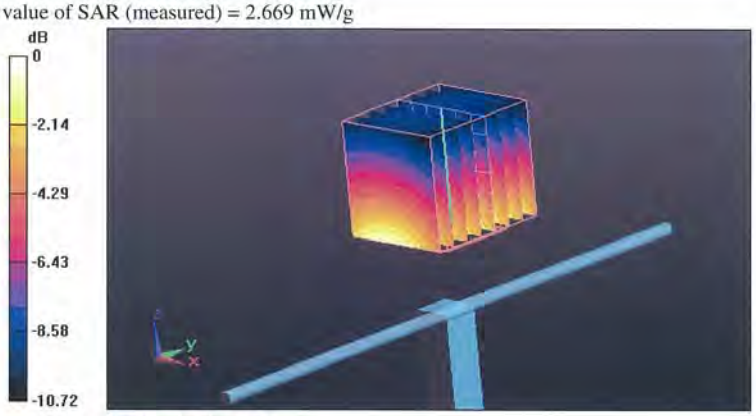
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900
Medium parameters used: f = 835 MHz; σ = 0.88 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.554 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.427 W/kg
SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.669 mW/g



0 dB = 2.670mW/g

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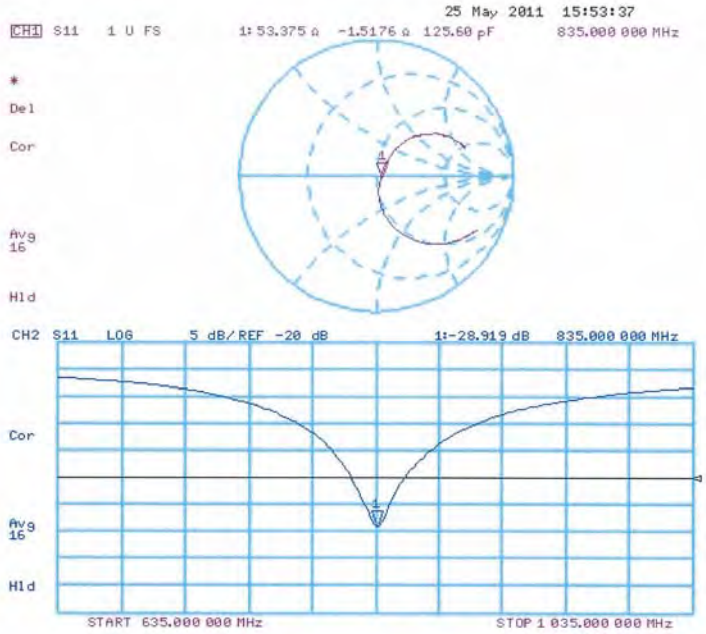
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

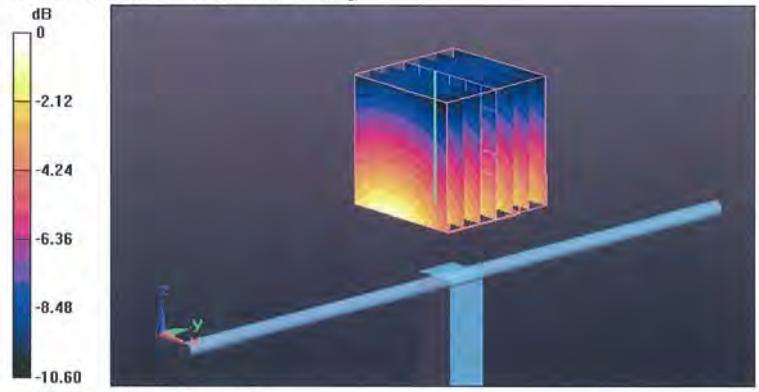
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.297 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.530 W/kg
SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.804 mW/g



0 dB = 2.800mW/g

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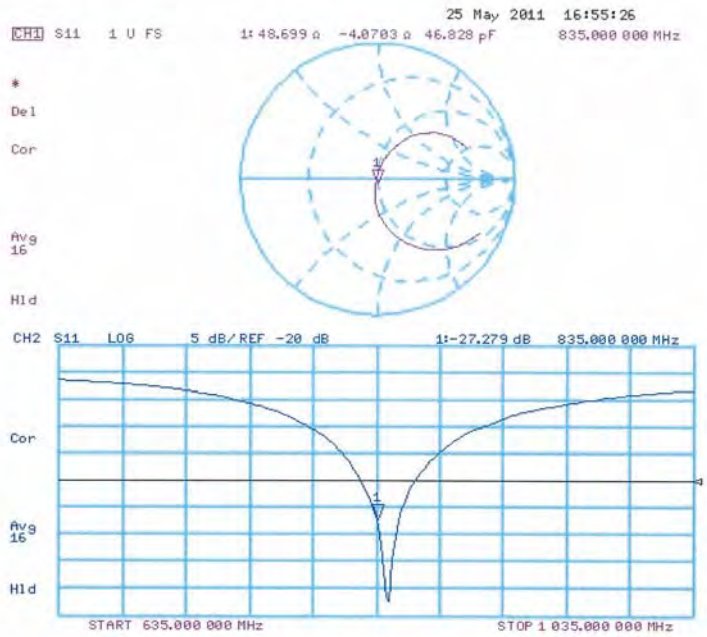
Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client SGS TW (Auden)

Certificate No: D1900V2-5d027_Apr11

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d027
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits
Calibration date:	April 19, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 19, 2011

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Certificate No: D1900V2-5d027_Apr11 Page 1 of 9

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Accreditation No.: SCS 108

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) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
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) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

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.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.41 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR normalized	normalized to 1W	40.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**40.1 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.26 mW / g
SAR normalized	normalized to 1W	21.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.9 mW /g ± 16.5 % (k=2)**

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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	51.1 ± 6 %	1.52 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.93 mW / g
SAR normalized	normalized to 1W	39.7 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**39.4 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.18 mW / g
SAR normalized	normalized to 1W	20.7 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.6 mW / g ± 16.5 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.8 Ω + 6.4 jΩ
Return Loss	- 23.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.1 Ω + 6.6 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 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.
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/Time: 18.04.2011 15:27:22

Test Laboratory: SPEAG, Zurich, Switzerland

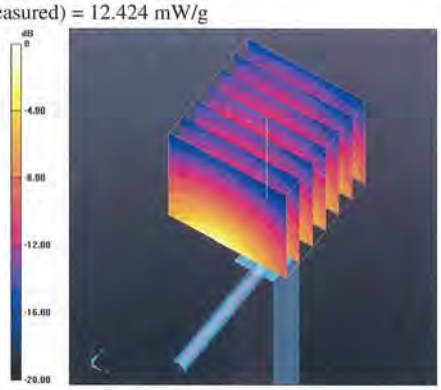
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

Pin=250 mW, Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.235 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 18.650 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.26 mW/g
Maximum value of SAR (measured) = 12.424 mW/g



0 dB = 12.420mW/g

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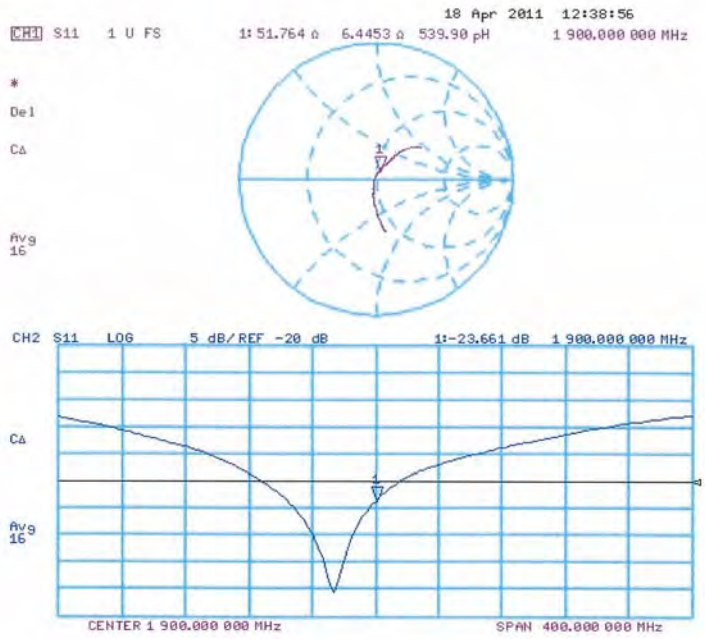
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date/Time: 19.04.2011 12:53:51

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

Pin=250 mW, Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.170 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 17.156 W/kg
SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.18 mW/g
Maximum value of SAR (measured) = 12.615 mW/g

0 dB = 12.610mW/g

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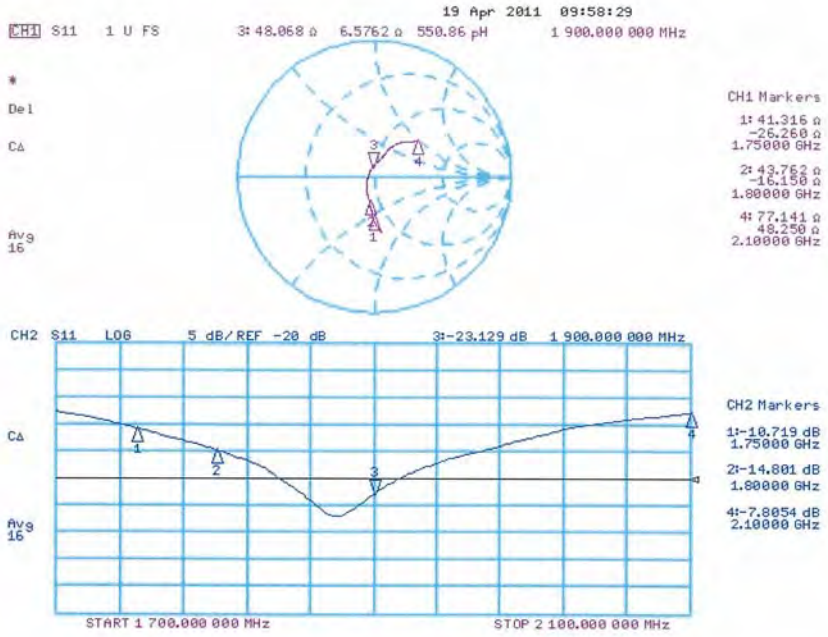
Impedance Measurement Plot for Body TSL



End of 1st part of report

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