SAR TEST REPORT

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

Equipment Under Test	Smart Phone
Brand Name	SHARP
Model No.	HR00204
Company Name	SHARP CORPORATION
Company Address	22-22, Nagaike-cho, Abeno-ku, CS & Env. Promotion Div. Quality Compliance Dept. Osaka 545-8522, Japan
Standards	OET 65 supplement C, IEEE /ANSI C95.1 , C95.3, IEEE 1528
FCC ID	APYHRO00204
Date of Receipt	May. 25, 2014
Date of Test(s)	Jun. 12, 2014 ~ Jun. 28, 2014
Date of Issue	Jul. 17, 2014

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

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

Signed on behalf of SGS

Engineer	**Asst. Manager**
Pin Chu	**Kelly Tsai**
Date: Jul. 17, 2014	**Date: Jul. 17, 2014**

Version

Report Number	Revision	Issue Date	Description
ES/2014/50013	00	Jul. 04, 2014	Initial creation of test report.
ES/2014/50013	01	Jul. 14, 2014	1st modification
ES/2014/50013	02	Jul. 17, 2014	2nd modification

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

Contents

1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Electronics & Communication Laboratory	
No.134, Wu Kung Road, New Taipei Industrial Park	
Wuku District, New Taipei City, Taiwan	
Tel	+886-2-2299-3279
Fax	+886-2-2298-0488
Internet	http://www.tw.sgs.com/
Testing Location	1F, No.8, Alley 15, Lane 120, Sec .1, NeiHu Road NeiHu District Taipei City 114, Taiwan

1.2 Details of Applicant

Company Name	SHARP CORPORATION
Company Address	22-22, Nagaike-cho, Abeno-ku, CS & Env. Promotion Div. Quality Compliance Dept. Osaka 545-8522, Japan
Contact Person & Job Title	Masaaki Nishikawa / Department General Manager
Tel	+81-6-6625-1197

1.3 Description of EUT

EUT Name	Smart Phone			
Brand Name	SHARP			
Model No	HR00204			
MEID	990005270007199			
FCC ID	APYHRO00204			
Mode of Operation	☒LTE FDD ☒LTE TDD ☒CDMA			
	☒CDMA EVDO Rev.0/ Rev.A ☒WLAN802.11 b/g/n (20M)			
	☒Bluetooth			
Duty Cycle	LTE FDD	1		
	LTE TDD	0.633		
	CDMA / EVDO Rev.0/ Rev. A	1		
	WLAN 802.11 b/g/n(20M)	1		
	Bluetooth	1		
TX Frequency Range (MHz)	LTE FDD Band XXV	1860	—	1905
	LTE FDD Band XXVI	819	—	844
	LTE TDD Band XLI	2506	—	2680
	CDMA (BC0)	824.7	—	848.31
	CDMA (BC1)	1851.25	—	1908.75
	CDMA (BC10)	817.9	—	823.1
	WLAN 802.11 b/g/n(20M)	2412	—	2462
	Bluetooth	2402	—	2480
Channel Number (ARFCN)	LTE FDD Band XXV	26140	—	26590
	LTE FDD Band XXVI	26740	—	26990
	LTE TDD Band XLI	39750	—	41490
	CDMA (BC0)	1013	—	777
	CDMA (BC1)	25	—	1175
	CDMA (BC10)	476	—	684
	WLAN 802.11 b/g/n(20M)	1	—	11
	Bluetooth	0	—	78

Max. SAR (1 g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Head	LTE FDD Band XXV	0.641	0.714	☐Left ☒Right ☒Cheek ☐Tilt 26140 Channel
	LTE FDD Band XXVI	0.366	0.449	☐Left ☒Right ☒Cheek ☐Tilt 26865 Channel
	LTE TDD Band XLI	0.258	0.280	☐Left ☒Right ☒Cheek ☐Tilt 41490 Channel
	CDMA (BC0)	0.326	0.402	☐Left ☒Right ☒Cheek ☐Tilt 1013 Channel
	CDMA (BC1)	0.795	0.919	☐Left ☒Right ☒Cheek ☐Tilt 25 Channel
	CDMA (BC10)	0.333	0.410	☐Left ☒Right ☒Cheek ☐Tilt 476 Channel
	CDMA (BC0) EVDO Rev. A	0.31	0.387	☐Left ☒Right ☒Cheek ☐Tilt 1013 Channel
	CDMA EVDO(BC1) EVDO Rev. A	0.793	0.938	☐Left ☒Right ☒Cheek ☐Tilt 25 Channel
	CDMA(BC10) EVDO Rev. A	0.28	0.363	☐Left ☒Right ☒Cheek ☐Tilt 560 Channel
	WLAN802.11 b	0.073	0.101	☒Left ☐Right ☐Cheek ☒Tilt 6 Channel

Max. SAR (1 g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Body worn	LTE FDD Band XXV	0.414	0.461	☐Front ☒Back 26140 Channel
	LTE FDD Band XXVI	0.396	0.489	☐Front ☒Back 26740 Channel
	LTE TDD Band XLI	0.37	0.424	☐Front ☒Back 40185 Channel
	CDMA (BC0)	0.439	0.540	☐Front ☒Back 1013 Channel
	CDMA (BC1)	0.555	0.634	☒Front ☐Back 600 Channel
	CDMA (BC10)	0.455	0.561	☐Front ☒Back 476 Channel
	WLAN802.11 b	0.035	0.048	☐Front ☒Back 6 Channel

Max. SAR (1 g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Hotspot mode	LTE FDD Band XXV	0.647	0.721	☐Front ☒Back ☐Bottom ☐Right ☐Left 26140 Channel
	LTE FDD Band XXVI	0.614	0.759	☐Front ☒Back ☐Bottom ☐Right ☐Left 26740 Channel
	LTE TDD Band XLI	1.17	1.340	☐Front ☐Back ☒Bottom ☐Right ☐Left 40185 Channel - repeated with worse case
	CDMA (BC0) EVDO Rev. 0	0.694	0.858	☐Front ☒Back ☐Bottom ☐Right ☐Left 1013 Channel - repeated with worse case
	CDMA (BC1) EVDO Rev. 0	0.658	0.771	☐Front ☒Back ☐Bottom ☐Right ☐Left 25 Channel
	CDMA (BC10)EVDO Rev. 0	0.721	0.937	☐Front ☒Back ☐Bottom ☐Right ☐Left 476 Channel - repeated with worse case
	WLAN802.11 b	0.108	0.149	☐Front ☒Back ☐Bottom ☐Right ☐Left 6 Channel

#. Conducted power table:

LTE FDD Band XXV conducted power table:

FDD Band XXV								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	1860	26140	23.73	24.2	0.00
				1882.5	26365	23.65	24.2	0.00
				1905	26590	23.62	24.2	0.00
			50	1860	26140	23.72	24.2	0.00
				1882.5	26365	23.63	24.2	0.00
				1905	26590	23.81	24.2	0.00
			99	1860	26140	23.65	24.2	0.00
				1882.5	26365	23.62	24.2	0.00
				1905	26590	23.76	24.2	0.00
		50 RB	0	1860	26140	22.81	23.2	0-1
				1882.5	26365	22.78	23.2	0-1
				1905	26590	22.72	23.2	0-1
			25	1860	26140	22.79	23.2	0-1
				1882.5	26365	22.82	23.2	0-1
				1905	26590	22.76	23.2	0-1
			50	1860	26140	22.83	23.2	0-1
				1882.5	26365	22.69	23.2	0-1
				1905	26590	22.86	23.2	0-1
		100RB		1860	26140	22.77	23.2	0-1
				1882.5	26365	22.71	23.2	0-1
				1905	26590	22.79	23.2	0-1
	16-QAM	1 RB	0	1860	26140	22.51	23.2	0-1
				1882.5	26365	22.33	23.2	0-1
				1905	26590	22.64	23.2	0-1
			50	1860	26140	22.52	23.2	0-1
				1882.5	26365	22.14	23.2	0-1
				1905	26590	22.46	23.2	0-1
			99	1860	26140	22.79	23.2	0-1
				1882.5	26365	22.47	23.2	0-1
				1905	26590	22.78	23.2	0-1
		50 RB	0	1860	26140	21.64	22.2	0-2
				1882.5	26365	21.59	22.2	0-2
				1905	26590	21.64	22.2	0-2
			25	1860	26140	21.69	22.2	0-2
				1882.5	26365	21.70	22.2	0-2
				1905	26590	21.73	22.2	0-2
			50	1860	26140	21.73	22.2	0-2
				1882.5	26365	21.57	22.2	0-2
				1905	26590	21.75	22.2	0-2
		100RB		1860	26140	21.73	22.2	0-2
				1882.5	26365	21.66	22.2	0-2
				1905	26590	21.74	22.2	0-2

FDD Band XXV								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	1857.5	26115	23.35	24.2	0.00
				1882.5	26365	23.67	24.2	0.00
				1907.5	26615	23.62	24.2	0.00
			36	1857.5	26115	23.80	24.2	0.00
				1882.5	26365	23.71	24.2	0.00
				1907.5	26615	23.55	24.2	0.00
			74	1857.5	26115	23.72	24.2	0.00
				1882.5	26365	23.63	24.2	0.00
				1907.5	26615	23.47	24.2	0.00
		36 RB	0	1857.5	26115	22.68	23.2	0-1
				1882.5	26365	22.67	23.2	0-1
				1907.5	26615	22.66	23.2	0-1
			18	1857.5	26115	22.70	23.2	0-1
				1882.5	26365	22.70	23.2	0-1
				1907.5	26615	22.75	23.2	0-1
			37	1857.5	26115	22.69	23.2	0-1
				1882.5	26365	22.66	23.2	0-1
				1907.5	26615	22.81	23.2	0-1
		75RB		1857.5	26115	22.74	23.2	0-1
				1882.5	26365	22.67	23.2	0-1
				1907.5	26615	22.77	23.2	0-1
	16-QAM	1 RB	0	1857.5	26115	22.17	23.2	0-1
				1882.5	26365	22.37	23.2	0-1
				1907.5	26615	22.77	23.2	0-1
			36	1857.5	26115	22.92	23.2	0-1
				1882.5	26365	22.31	23.2	0-1
				1907.5	26615	22.66	23.2	0-1
			74	1857.5	26115	23.02	23.2	0-1
				1882.5	26365	22.75	23.2	0-1
				1907.5	26615	22.80	23.2	0-1
		36 RB	0	1857.5	26115	21.59	22.2	0-2
				1882.5	26365	21.65	22.2	0-2
				1907.5	26615	21.59	22.2	0-2
			18	1857.5	26115	21.61	22.2	0-2
				1882.5	26365	21.52	22.2	0-2
				1907.5	26615	21.72	22.2	0-2
			37	1857.5	26115	21.65	22.2	0-2
				1882.5	26365	21.58	22.2	0-2
				1907.5	26615	21.68	22.2	0-2
		75RB		1857.5	26115	21.70	22.2	0-2
				1882.5	26365	21.64	22.2	0-2
				1907.5	26615	21.73	22.2	0-2

FDD Band XXV								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	1855	26090	23.47	24.2	0.00
				1882.5	26365	23.48	24.2	0.00
				1910	26640	23.55	24.2	0.00
			25	1855	26090	23.78	24.2	0.00
				1882.5	26365	23.58	24.2	0.00
				1910	26640	23.64	24.2	0.00
			49	1855	26090	23.65	24.2	0.00
				1882.5	26365	23.56	24.2	0.00
				1910	26640	23.72	24.2	0.00
		25 RB	0	1855	26090	22.65	23.2	0-1
				1882.5	26365	22.69	23.2	0-1
				1910	26640	22.68	23.2	0-1
			12	1855	26090	22.67	23.2	0-1
				1882.5	26365	22.68	23.2	0-1
				1910	26640	22.68	23.2	0-1
			25	1855	26090	22.69	23.2	0-1
				1882.5	26365	22.64	23.2	0-1
				1910	26640	22.67	23.2	0-1
		50RB		1855	26090	22.74	23.2	0-1
				1882.5	26365	22.76	23.2	0-1
				1910	26640	22.78	23.2	0-1
	16-QAM	1 RB	0	1855	26090	22.12	23.2	0-1
				1882.5	26365	22.76	23.2	0-1
				1910	26640	22.44	23.2	0-1
			25	1855	26090	22.72	23.2	0-1
				1882.5	26365	22.28	23.2	0-1
				1910	26640	22.38	23.2	0-1
			49	1855	26090	22.46	23.2	0-1
				1882.5	26365	22.69	23.2	0-1
				1910	26640	22.54	23.2	0-1
		25 RB	0	1855	26090	21.56	22.2	0-2
				1882.5	26365	21.71	22.2	0-2
				1910	26640	21.64	22.2	0-2
			12	1855	26090	21.56	22.2	0-2
				1882.5	26365	21.73	22.2	0-2
				1910	26640	21.69	22.2	0-2
			25	1855	26090	21.70	22.2	0-2
				1882.5	26365	21.68	22.2	0-2
				1910	26640	21.57	22.2	0-2
		50RB		1855	26090	21.60	22.2	0-2
				1882.5	26365	21.60	22.2	0-2
				1910	26640	21.66	22.2	0-2

FDD Band XXV								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	1852.5	26065	23.89	24.2	0.00
				1882.5	26365	23.80	24.2	0.00
				1912.5	26665	23.60	24.2	0.00
			12	1852.5	26065	23.73	24.2	0.00
				1882.5	26365	23.52	24.2	0.00
				1912.5	26665	23.52	24.2	0.00
			24	1852.5	26065	23.57	24.2	0.00
				1882.5	26365	23.58	24.2	0.00
				1912.5	26665	23.63	24.2	0.00
		12 RB	0	1852.5	26065	22.62	23.2	0-1
				1882.5	26365	22.68	23.2	0-1
				1912.5	26665	22.77	23.2	0-1
			6	1852.5	26065	22.62	23.2	0-1
				1882.5	26365	22.65	23.2	0-1
				1912.5	26665	22.66	23.2	0-1
			13	1852.5	26065	22.62	23.2	0-1
				1882.5	26365	22.65	23.2	0-1
				1912.5	26665	22.66	23.2	0-1
		25RB		1852.5	26065	22.65	23.2	0-1
				1882.5	26365	22.74	23.2	0-1
				1912.5	26665	22.66	23.2	0-1
	16-QAM	1 RB	0	1852.5	26065	22.84	23.2	0-1
				1882.5	26365	22.59	23.2	0-1
				1912.5	26665	22.46	23.2	0-1
			12	1852.5	26065	22.52	23.2	0-1
				1882.5	26365	22.29	23.2	0-1
				1912.5	26665	22.82	23.2	0-1
			24	1852.5	26065	22.36	23.2	0-1
				1882.5	26365	22.41	23.2	0-1
				1912.5	26665	22.83	23.2	0-1
		12 RB	0	1852.5	26065	21.94	22.2	0-2
				1882.5	26365	21.47	22.2	0-2
				1912.5	26665	21.75	22.2	0-2
			6	1852.5	26065	21.59	22.2	0-2
				1882.5	26365	21.71	22.2	0-2
				1912.5	26665	21.66	22.2	0-2
			13	1852.5	26065	21.55	22.2	0-2
				1882.5	26365	21.54	22.2	0-2
				1912.5	26665	21.78	22.2	0-2
		25RB		1852.5	26065	21.55	22.2	0-2
				1882.5	26365	21.52	22.2	0-2
				1912.5	26665	21.61	22.2	0-2

FDD Band XXV								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	1851.5	26055	23.64	24.2	0.00
				1882.5	26365	23.68	24.2	0.00
				1913.5	26675	23.74	24.2	0.00
			7	1851.5	26055	23.51	24.2	0.00
				1882.5	26365	23.51	24.2	0.00
				1913.5	26675	23.66	24.2	0.00
			14	1851.5	26055	23.57	24.2	0.00
				1882.5	26365	23.50	24.2	0.00
				1913.5	26675	23.55	24.2	0.00
		8 RB	0	1851.5	26055	22.51	23.2	0-1
				1882.5	26365	22.72	23.2	0-1
				1913.5	26675	22.60	23.2	0-1
			4	1851.5	26055	22.60	23.2	0-1
				1882.5	26365	22.67	23.2	0-1
				1913.5	26675	22.60	23.2	0-1
			7	1851.5	26055	22.67	23.2	0-1
				1882.5	26365	22.55	23.2	0-1
				1913.5	26675	22.61	23.2	0-1
		15RB		1851.5	26055	22.64	23.2	0-1
				1882.5	26365	22.72	23.2	0-1
				1913.5	26675	22.67	23.2	0-1
	16-QAM	1 RB	0	1851.5	26055	22.17	23.2	0-1
				1882.5	26365	22.30	23.2	0-1
				1913.5	26675	22.94	23.2	0-1
			7	1851.5	26055	22.54	23.2	0-1
				1882.5	26365	22.16	23.2	0-1
				1913.5	26675	22.80	23.2	0-1
			14	1851.5	26055	22.49	23.2	0-1
				1882.5	26365	22.43	23.2	0-1
				1913.5	26675	22.33	23.2	0-1
		8 RB	0	1851.5	26055	21.58	22.2	0-2
				1882.5	26365	21.63	22.2	0-2
				1913.5	26675	21.61	22.2	0-2
			4	1851.5	26055	21.50	22.2	0-2
				1882.5	26365	21.52	22.2	0-2
				1913.5	26675	21.61	22.2	0-2
			7	1851.5	26055	21.54	22.2	0-2
				1882.5	26365	21.68	22.2	0-2
				1913.5	26675	21.68	22.2	0-2
		15RB		1851.5	26055	21.57	22.2	0-2
				1882.5	26365	21.66	22.2	0-2
				1913.5	26675	21.66	22.2	0-2

FDD Band XXV								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	1850.7	26047	23.61	24.2	0.00
				1882.5	26365	23.71	24.2	0.00
				1914.3	26683	23.53	24.2	0.00
			2	1850.7	26047	23.61	24.2	0.00
				1882.5	26365	23.59	24.2	0.00
				1914.3	26683	23.51	24.2	0.00
			5	1850.7	26047	23.54	24.2	0.00
				1882.5	26365	23.60	24.2	0.00
				1914.3	26683	23.55	24.2	0.00
		3 RB	0	1850.7	26047	23.70	24.2	0-1
				1882.5	26365	23.61	24.2	0-1
				1914.3	26683	23.64	24.2	0-1
			2	1850.7	26047	23.67	24.2	0-1
				1882.5	26365	23.67	24.2	0-1
				1914.3	26683	23.62	24.2	0-1
			3	1850.7	26047	23.61	24.2	0-1
				1882.5	26365	23.61	24.2	0-1
				1914.3	26683	23.66	24.2	0-1
		6RB		1850.7	26047	22.66	23.2	0-1
				1882.5	26365	22.73	23.2	0-1
				1914.3	26683	22.67	23.2	0-1
	16-QAM	1 RB	0	1850.7	26047	22.76	23.2	0-1
				1882.5	26365	22.44	23.2	0-1
				1914.3	26683	22.69	23.2	0-1
			2	1850.7	26047	22.41	23.2	0-1
				1882.5	26365	22.90	23.2	0-1
				1914.3	26683	22.87	23.2	0-1
			5	1850.7	26047	22.56	23.2	0-1
				1882.5	26365	22.12	23.2	0-1
				1914.3	26683	22.76	23.2	0-1
		3 RB	0	1850.7	26047	22.42	23.2	0-2
				1882.5	26365	22.66	23.2	0-2
				1914.3	26683	22.63	23.2	0-2
			2	1850.7	26047	22.62	23.2	0-2
				1882.5	26365	22.53	23.2	0-2
				1914.3	26683	22.53	23.2	0-2
			3	1850.7	26047	22.61	23.2	0-2
				1882.5	26365	22.45	23.2	0-2
				1914.3	26683	22.57	23.2	0-2
		6RB		1850.7	26047	21.50	22.2	0-2
				1882.5	26365	21.67	22.2	0-2
				1914.3	26683	21.47	22.2	0-2

LTE FDD Band XXVI onducted power table:

FDD Band XXVI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	819	26740	23.28	24.20	0
				831.5	26865	23.18	24.20	0
				844	26990	23.25	24.20	0
			25	819	26740	23.12	24.20	0
				831.5	26865	23.31	24.20	0
				844	26990	23.01	24.20	0
			49	819	26740	23.19	24.20	0
				831.5	26865	23.19	24.20	0
				844	26990	23.24	24.20	0
		25 RB	0	819	26740	22.25	23.20	0-1
				831.5	26865	22.30	23.20	0-1
				844	26990	22.34	23.20	0-1
			12	819	26740	22.22	23.20	0-1
				831.5	26865	22.27	23.20	0-1
				844	26990	22.28	23.20	0-1
			25	819	26740	22.26	23.20	0-1
				831.5	26865	22.28	23.20	0-1
				844	26990	22.27	23.20	0-1
		50RB		819	26740	22.36	23.20	0-1
				831.5	26865	22.46	23.20	0-1
				844	26990	22.36	23.20	0-1
	16-QAM	1 RB	0	819	26740	21.92	23.20	0-1
				831.5	26865	21.92	23.20	0-1
				844	26990	22.14	23.20	0-1
			25	819	26740	22.08	23.20	0-1
				831.5	26865	22.52	23.20	0-1
				844	26990	22.16	23.20	0-1
			49	819	26740	22.12	23.20	0-1
				831.5	26865	22.41	23.20	0-1
				844	26990	22.19	23.20	0-1
		25 RB	0	819	26740	21.19	22.20	0-2
				831.5	26865	21.30	22.20	0-2
				844	26990	21.31	22.20	0-2
			12	819	26740	21.32	22.20	0-2
				831.5	26865	21.27	22.20	0-2
				844	26990	21.36	22.20	0-2
			25	819	26740	21.28	22.20	0-2
				831.5	26865	21.29	22.20	0-2
				844	26990	21.61	22.20	0-2
		50RB		819	26740	21.23	22.20	0-2
				831.5	26865	21.36	22.20	0-2
				844	26990	21.33	22.20	0-2

FDD Band XXVI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	816.5	26715	23.04	24.20	0
				831.5	26865	23.05	24.20	0
				846.5	27015	23.23	24.20	0
			12	816.5	26715	22.98	24.20	0
				831.5	26865	23.32	24.20	0
				846.5	27015	23.26	24.20	0
			24	816.5	26715	23.24	24.20	0
				831.5	26865	23.21	24.20	0
				846.5	27015	23.30	24.20	0
		12 RB	0	816.5	26715	22.22	23.20	0-1
				831.5	26865	22.26	23.20	0-1
				846.5	27015	22.28	23.20	0-1
			6	816.5	26715	22.18	23.20	0-1
				831.5	26865	22.28	23.20	0-1
				846.5	27015	22.31	23.20	0-1
			13	816.5	26715	22.28	23.20	0-1
				831.5	26865	22.24	23.20	0-1
				846.5	27015	22.35	23.20	0-1
		25RB		816.5	26715	22.21	23.20	0-1
				831.5	26865	22.21	23.20	0-1
				846.5	27015	22.21	23.20	0-1
	16-QAM	1 RB	0	816.5	26715	22.35	23.20	0-1
				831.5	26865	21.88	23.20	0-1
				846.5	27015	22.48	23.20	0-1
			12	816.5	26715	21.81	23.20	0-1
				831.5	26865	22.15	23.20	0-1
				846.5	27015	22.18	23.20	0-1
			24	816.5	26715	22.04	23.20	0-1
				831.5	26865	22.27	23.20	0-1
				846.5	27015	22.35	23.20	0-1
		12 RB	0	816.5	26715	21.16	22.20	0-2
				831.5	26865	21.43	22.20	0-2
				846.5	27015	21.36	22.20	0-2
			6	816.5	26715	21.25	22.20	0-2
				831.5	26865	21.41	22.20	0-2
				846.5	27015	21.46	22.20	0-2
			13	816.5	26715	21.38	22.20	0-2
				831.5	26865	21.33	22.20	0-2
				846.5	27015	21.26	22.20	0-2
		25RB		816.5	26715	21.32	22.20	0-2
				831.5	26865	21.26	22.20	0-2
				846.5	27015	21.35	22.20	0-2

FDD Band XXVI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	815.5	26705	23.19	24.20	0
				831.5	26865	23.37	24.20	0
				847.5	27025	23.31	24.20	0
			7	815.5	26705	23.22	24.20	0
				831.5	26865	23.20	24.20	0
				847.5	27025	23.27	24.20	0
			14	815.5	26705	23.15	24.20	0
				831.5	26865	23.30	24.20	0
				847.5	27025	23.27	24.20	0
		8 RB	0	815.5	26705	22.14	23.20	0-1
				831.5	26865	22.30	23.20	0-1
				847.5	27025	22.32	23.20	0-1
			4	815.5	26705	22.22	23.20	0-1
				831.5	26865	22.31	23.20	0-1
				847.5	27025	22.31	23.20	0-1
			7	815.5	26705	22.24	23.20	0-1
				831.5	26865	22.22	23.20	0-1
				847.5	27025	22.32	23.20	0-1
		15RB		815.5	26705	22.25	23.20	0-1
				831.5	26865	22.33	23.20	0-1
				847.5	27025	22.40	23.20	0-1
	16-QAM	1 RB	0	815.5	26705	21.65	23.20	0-1
				831.5	26865	22.48	23.20	0-1
				847.5	27025	22.48	23.20	0-1
			7	815.5	26705	21.93	23.20	0-1
				831.5	26865	22.52	23.20	0-1
				847.5	27025	22.01	23.20	0-1
			14	815.5	26705	21.98	23.20	0-1
				831.5	26865	22.06	23.20	0-1
				847.5	27025	22.24	23.20	0-1
		8 RB	0	815.5	26705	21.19	22.20	0-2
				831.5	26865	21.31	22.20	0-2
				847.5	27025	21.32	22.20	0-2
			4	815.5	26705	21.13	22.20	0-2
				831.5	26865	21.39	22.20	0-2
				847.5	27025	21.30	22.20	0-2
			7	815.5	26705	21.25	22.20	0-2
				831.5	26865	21.39	22.20	0-2
				847.5	27025	21.36	22.20	0-2
		15RB		815.5	26705	21.12	22.20	0-2
				831.5	26865	21.09	22.20	0-2
				847.5	27025	21.28	22.20	0-2

FDD Band XXVI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	814.7	26697	23.04	24.20	0
				831.5	26865	23.14	24.20	0
				848.3	27033	23.19	24.20	0
			2	814.7	26697	23.26	24.20	0
				831.5	26865	23.33	24.20	0
				848.3	27033	23.33	24.20	0
			5	814.7	26697	23.15	24.20	0
				831.5	26865	23.30	24.20	0
				848.3	27033	23.32	24.20	0
		3 RB	0	814.7	26697	23.22	24.20	0-1
				831.5	26865	23.27	24.20	0-1
				848.3	27033	23.36	24.20	0-1
			2	814.7	26697	23.16	24.20	0-1
				831.5	26865	23.20	24.20	0-1
				848.3	27033	23.35	24.20	0-1
			3	814.7	26697	23.17	24.20	0-1
				831.5	26865	23.29	24.20	0-1
				848.3	27033	23.30	24.20	0-1
		6RB		814.7	26697	22.20	23.20	0-1
				831.5	26865	22.31	23.20	0-1
				848.3	27033	22.36	23.20	0-1
	16-QAM	1 RB	0	814.7	26697	22.40	23.20	0-1
				831.5	26865	22.24	23.20	0-1
				848.3	27033	22.18	23.20	0-1
			2	814.7	26697	22.07	23.20	0-1
				831.5	26865	22.57	23.20	0-1
				848.3	27033	22.29	23.20	0-1
			5	814.7	26697	22.35	23.20	0-1
				831.5	26865	22.48	23.20	0-1
				848.3	27033	22.51	23.20	0-1
		3 RB	0	814.7	26697	22.25	23.20	0-2
				831.5	26865	22.28	23.20	0-2
				848.3	27033	22.33	23.20	0-2
			2	814.7	26697	22.25	23.20	0-2
				831.5	26865	22.30	23.20	0-2
				848.3	27033	22.36	23.20	0-2
			3	814.7	26697	22.17	23.20	0-2
				831.5	26865	22.23	23.20	0-2
				848.3	27033	22.27	23.20	0-2
		6RB		814.7	26697	21.25	22.20	0-2
				831.5	26865	21.18	22.20	0-2
				848.3	27033	21.29	22.20	0-2

LTE TDD Band XLI conducted power table:

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	2506	39750	22.95	23.40	0.00
				2549.5	40185	23.12	24.00	0.00
				2593	40620	23.32	24.00	0.00
				2636.5	41055	23.55	24.00	0.00
				2680	41490	23.65	24.00	0.00
			50	2506	39750	23.14	23.40	0.00
				2549.5	40185	23.22	24.00	0.00
				2593	40620	23.45	24.00	0.00
				2636.5	41055	23.53	24.00	0.00
				2680	41490	23.42	24.00	0.00
			99	2506	39750	23.02	23.40	0.00
				2549.5	40185	23.41	24.00	0.00
				2593	40620	23.31	24.00	0.00
				2636.5	41055	23.53	24.00	0.00
				2680	41490	23.37	24.00	0.00
		50 RB	0	2506	39750	22.15	22.40	0-1
				2549.5	40185	22.47	23.00	0-1
				2593	40620	22.69	23.00	0-1
				2636.5	41055	22.63	23.00	0-1
				2680	41490	22.57	23.00	0-1
			25	2506	39750	22.13	22.40	0-1
				2549.5	40185	22.38	23.00	0-1
				2593	40620	22.56	23.00	0-1
				2636.5	41055	22.56	23.00	0-1
				2680	41490	22.40	23.00	0-1
			50	2506	39750	22.05	22.40	0-1
				2549.5	40185	22.48	23.00	0-1
				2593	40620	22.57	23.00	0-1
				2636.5	41055	22.52	23.00	0-1
				2680	41490	22.34	23.00	0-1
		100RB		2506	39750	22.11	22.40	0-1
				2549.5	40185	22.43	23.00	0-1
				2593	40620	22.64	23.00	0-1
				2636.5	41055	22.53	23.00	0-1
				2680	41490	22.41	23.00	0-1

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	16-QAM	1 RB	0	2506	39750	22.13	22.40	0-1
				2549.5	40185	22.33	23.00	0-1
				2593	40620	22.62	23.00	0-1
				2636.5	41055	22.43	23.00	0-1
				2680	41490	22.42	23.00	0-1
			50	2506	39750	22.07	22.40	0-1
				2549.5	40185	22.36	23.00	0-1
				2593	40620	22.53	23.00	0-1
				2636.5	41055	22.42	23.00	0-1
				2680	41490	22.31	23.00	0-1
			99	2506	39750	21.81	22.40	0-1
				2549.5	40185	22.46	23.00	0-1
				2593	40620	22.52	23.00	0-1
				2636.5	41055	22.31	23.00	0-1
				2680	41490	22.36	23.00	0-1
		50 RB	0	2506	39750	21.14	21.40	0-2
				2549.5	40185	21.39	22.00	0-2
				2593	40620	21.55	22.00	0-2
				2636.5	41055	21.53	22.00	0-2
				2680	41490	21.56	22.00	0-2
			25	2506	39750	21.14	21.40	0-2
				2549.5	40185	21.43	22.00	0-2
				2593	40620	21.57	22.00	0-2
				2636.5	41055	21.59	22.00	0-2
				2680	41490	21.49	22.00	0-2
			50	2506	39750	21.06	21.40	0-2
				2549.5	40185	21.42	22.00	0-2
				2593	40620	21.60	22.00	0-2
				2636.5	41055	21.55	22.00	0-2
				2680	41490	21.47	22.00	0-2
		100RB		2506	39750	21.11	21.40	0-2
				2549.5	40185	21.46	22.00	0-2
				2593	40620	21.51	22.00	0-2
				2636.5	41055	21.55	22.00	0-2
				2680	41490	21.52	22.00	0-2

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	2503.5	39725	23.17	23.40	0.00
				2548.3	40173	23.40	24.00	0.00
				2593	40620	23.55	24.00	0.00
				2637.8	41068	23.49	24.00	0.00
				2682.5	41515	23.62	24.00	0.00
			36	2503.5	39725	23.19	23.40	0.00
				2548.3	40173	23.35	24.00	0.00
				2593	40620	23.57	24.00	0.00
				2637.8	41068	23.56	24.00	0.00
				2682.5	41515	23.56	24.00	0.00
			74	2503.5	39725	23.02	23.40	0.00
				2548.3	40173	23.35	24.00	0.00
				2593	40620	23.60	24.00	0.00
				2637.8	41068	23.49	24.00	0.00
				2682.5	41515	23.46	24.00	0.00
		36 RB	0	2503.5	39725	22.18	22.40	0-1
				2548.3	40173	22.45	23.00	0-1
				2593	40620	22.56	23.00	0-1
				2637.8	41068	22.53	23.00	0-1
				2682.5	41515	22.42	23.00	0-1
			18	2503.5	39725	22.08	22.40	0-1
				2548.3	40173	22.37	23.00	0-1
				2593	40620	22.55	23.00	0-1
				2637.8	41068	22.48	23.00	0-1
				2682.5	41515	22.48	23.00	0-1
			37	2503.5	39725	22.02	22.40	0-1
				2548.3	40173	22.43	23.00	0-1
				2593	40620	22.59	23.00	0-1
				2637.8	41068	22.51	23.00	0-1
				2682.5	41515	22.43	23.00	0-1
		75RB		2503.5	39725	22.18	22.40	0-1
				2548.3	40173	22.43	23.00	0-1
				2593	40620	22.61	23.00	0-1
				2637.8	41068	22.55	23.00	0-1
				2682.5	41515	22.43	23.00	0-1

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	16-QAM	1 RB	0	2503.5	39725	22.18	22.40	0-1
				2548.3	40173	22.41	23.00	0-1
				2593	40620	22.59	23.00	0-1
				2637.8	41068	22.33	23.00	0-1
				2682.5	41515	22.50	23.00	0-1
			36	2503.5	39725	22.11	22.40	0-1
				2548.3	40173	22.36	23.00	0-1
				2593	40620	22.45	23.00	0-1
				2637.8	41068	22.37	23.00	0-1
				2682.5	41515	22.46	23.00	0-1
			74	2503.5	39725	22.06	22.40	0-1
				2548.3	40173	22.39	23.00	0-1
				2593	40620	22.51	23.00	0-1
				2637.8	41068	22.34	23.00	0-1
				2682.5	41515	22.48	23.00	0-1
		36 RB	0	2503.5	39725	21.13	21.40	0-2
				2548.3	40173	21.34	22.00	0-2
				2593	40620	21.53	22.00	0-2
				2637.8	41068	21.49	22.00	0-2
				2682.5	41515	21.49	22.00	0-2
			18	2503.5	39725	21.05	21.40	0-2
				2548.3	40173	21.36	22.00	0-2
				2593	40620	21.53	22.00	0-2
				2637.8	41068	21.57	22.00	0-2
				2682.5	41515	21.55	22.00	0-2
			37	2503.5	39725	21.01	21.40	0-2
				2548.3	40173	21.43	22.00	0-2
				2593	40620	21.58	22.00	0-2
				2637.8	41068	21.50	22.00	0-2
				2682.5	41515	21.51	22.00	0-2
		75RB		2503.5	39725	21.07	21.40	0-2
				2548.3	40173	21.47	22.00	0-2
				2593	40620	21.55	22.00	0-2
				2637.8	41068	21.57	22.00	0-2
				2682.5	41515	21.40	22.00	0-2

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	2501	39700	23.02	23.40	0.00
				2547	40160	23.24	24.00	0.00
				2593	40620	23.41	24.00	0.00
				2639	41080	23.35	24.00	0.00
				2685	41540	23.30	24.00	0.00
			25	2501	39700	23.06	23.40	0.00
				2547	40160	23.21	24.00	0.00
				2593	40620	23.48	24.00	0.00
				2639	41080	23.47	24.00	0.00
				2685	41540	23.39	24.00	0.00
			49	2501	39700	22.94	23.40	0.00
				2547	40160	23.32	24.00	0.00
				2593	40620	23.51	24.00	0.00
				2639	41080	23.36	24.00	0.00
				2685	41540	23.43	24.00	0.00
		25 RB	0	2501	39700	22.21	22.40	0-1
				2547	40160	22.43	23.00	0-1
				2593	40620	22.53	23.00	0-1
				2639	41080	22.53	23.00	0-1
				2685	41540	22.48	23.00	0-1
			12	2501	39700	22.11	22.40	0-1
				2547	40160	22.41	23.00	0-1
				2593	40620	22.52	23.00	0-1
				2639	41080	22.53	23.00	0-1
				2685	41540	22.48	23.00	0-1
			25	2501	39700	22.05	22.40	0-1
				2547	40160	22.45	23.00	0-1
				2593	40620	22.66	23.00	0-1
				2639	41080	22.53	23.00	0-1
				2685	41540	22.48	23.00	0-1
		50RB		2501	39700	22.09	22.40	0-1
				2547	40160	22.42	23.00	0-1
				2593	40620	22.62	23.00	0-1
				2639	41080	22.53	23.00	0-1
				2685	41540	22.41	23.00	0-1

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	16-QAM	1 RB	0	2501	39700	22.20	22.40	0-1
				2547	40160	22.40	23.00	0-1
				2593	40620	22.52	23.00	0-1
				2639	41080	22.49	23.00	0-1
				2685	41540	22.46	23.00	0-1
			25	2501	39700	22.16	22.40	0-1
				2547	40160	22.36	23.00	0-1
				2593	40620	22.56	23.00	0-1
				2639	41080	22.46	23.00	0-1
				2685	41540	22.37	23.00	0-1
			49	2501	39700	22.04	22.40	0-1
				2547	40160	22.34	23.00	0-1
				2593	40620	22.58	23.00	0-1
				2639	41080	22.37	23.00	0-1
				2685	41540	22.53	23.00	0-1
		25 RB	0	2501	39700	21.24	21.40	0-2
				2547	40160	21.49	22.00	0-2
				2593	40620	21.68	22.00	0-2
				2639	41080	21.57	22.00	0-2
				2685	41540	21.62	22.00	0-2
			12	2501	39700	21.13	21.40	0-2
				2547	40160	21.46	22.00	0-2
				2593	40620	21.66	22.00	0-2
				2639	41080	21.58	22.00	0-2
				2685	41540	21.58	22.00	0-2
			25	2501	39700	21.19	21.40	0-2
				2547	40160	21.39	22.00	0-2
				2593	40620	21.61	22.00	0-2
				2639	41080	21.58	22.00	0-2
				2685	41540	21.61	22.00	0-2
		50RB		2501	39700	21.09	21.40	0-2
				2547	40160	21.45	22.00	0-2
				2593	40620	21.52	22.00	0-2
				2639	41080	21.55	22.00	0-2
				2685	41540	21.42	22.00	0-2

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	2498.5	39675	23.25	23.40	0.00
				2547.8	40148	23.32	24.00	0.00
				2593	40620	23.41	24.00	0.00
				2640.3	41093	23.50	24.00	0.00
				2687.5	41565	23.54	24.00	0.00
			12	2498.5	39675	23.15	23.40	0.00
				2547.8	40148	23.36	24.00	0.00
				2593	40620	23.39	24.00	0.00
				2640.3	41093	23.41	24.00	0.00
				2687.5	41565	23.50	24.00	0.00
			24	2498.5	39675	23.06	23.40	0.00
				2547.8	40148	23.27	24.00	0.00
				2593	40620	23.53	24.00	0.00
				2640.3	41093	23.28	24.00	0.00
				2687.5	41565	23.37	24.00	0.00
		12 RB	0	2498.5	39675	22.24	22.40	0-1
				2547.8	40148	22.47	23.00	0-1
				2593	40620	22.63	23.00	0-1
				2640.3	41093	22.56	23.00	0-1
				2687.5	41565	22.34	23.00	0-1
			6	2498.5	39675	22.22	22.40	0-1
				2547.8	40148	22.38	23.00	0-1
				2593	40620	22.51	23.00	0-1
				2640.3	41093	22.56	23.00	0-1
				2687.5	41565	22.47	23.00	0-1
			13	2498.5	39675	22.19	22.40	0-1
				2547.8	40148	22.42	23.00	0-1
				2593	40620	22.61	23.00	0-1
				2640.3	41093	22.47	23.00	0-1
				2687.5	41565	22.48	23.00	0-1
		25RB		2498.5	39675	22.19	22.40	0-1
				2547.8	40148	22.38	23.00	0-1
				2593	40620	22.59	23.00	0-1
				2640.3	41093	22.54	23.00	0-1
				2687.5	41565	22.43	23.00	0-1

FDD Band XLI								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	16-QAM	1 RB	0	2498.5	39675	22.13	22.40	0-1
				2547.8	40148	22.39	23.00	0-1
				2593	40620	22.49	23.00	0-1
				2640.3	41093	22.40	23.00	0-1
				2687.5	41565	22.43	23.00	0-1
			12	2498.5	39675	22.11	22.40	0-1
				2547.8	40148	22.35	23.00	0-1
				2593	40620	22.48	23.00	0-1
				2640.3	41093	22.41	23.00	0-1
				2687.5	41565	22.48	23.00	0-1
			24	2498.5	39675	22.04	22.40	0-1
				2547.8	40148	22.42	23.00	0-1
				2593	40620	22.57	23.00	0-1
				2640.3	41093	22.42	23.00	0-1
				2687.5	41565	22.38	23.00	0-1
		12 RB	0	2498.5	39675	21.15	21.40	0-2
				2547.8	40148	21.52	22.00	0-2
				2593	40620	21.56	22.00	0-2
				2640.3	41093	21.60	22.00	0-2
				2687.5	41565	21.48	22.00	0-2
			6	2498.5	39675	21.14	21.40	0-2
				2547.8	40148	21.43	22.00	0-2
				2593	40620	21.54	22.00	0-2
				2640.3	41093	21.50	22.00	0-2
				2687.5	41565	21.60	22.00	0-2
			13	2498.5	39675	21.20	21.40	0-2
				2547.8	40148	21.46	22.00	0-2
				2593	40620	21.63	22.00	0-2
				2640.3	41093	21.50	22.00	0-2
				2687.5	41565	21.50	22.00	0-2
		25RB		2498.5	39675	21.22	21.40	0-2
				2547.8	40148	21.45	22.00	0-2
				2593	40620	21.53	22.00	0-2
				2640.3	41093	21.59	22.00	0-2
				2687.5	41565	21.59	22.00	0-2

CDMA conducted power table:

Band	Channel	Frequency (MHz)	Tune-up tolerance limit	1xRTT				EVDO	
				SO55	SO55	TDSO/SO32	TDSO/SO32	1x EvDO Rev. 0, FTAP/RTAP	1x EvDO Rev. A, FETAP/RETAP
				RC1	RC3	FCH+SCH	FCH	Subtype 0/1	Subtype 2
CDMA (BC0)	1013	824.7	24.8	23.91	23.89	23.89	23.9	23.88	23.84
	384	836.52	24.8	23.93	23.91	23.91	23.92	23.92	23.91
	777	848.31	24.8	23.93	23.89	23.88	23.89	23.89	23.88
CDMA (BC1)	25	1851.25	24.8	24.15	24.17	24.19	24.2	24.11	24.07
	600	1880	24.8	24.22	24.22	24.2	24.22	24.11	24.1
	1175	1908.75	24.8	24.14	24.13	24.16	24.17	24.08	24.08
CDMA (BC10)	476	817.9	24.8	23.91	23.9	23.87	23.89	23.66	23.69
	560	820	24.8	23.89	23.9	23.86	23.89	23.7	23.67
	684	823.1	24.8	23.87	23.85	23.89	23.91	23.66	23.66

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

802.11b		Max. Rated Avg. Power + Max. Tolerance (dBm)	Average Power Output (dBm)			
CH	Frequency (MHz)		Data Rate (Mbps)			
			1	2	5.5	11
1	2412	15.00	13.42	13.34	13.31	13.29
6	2437	15.50	14.11	14.01	13.95	13.90
11	2462	15.00	13.33	13.26	13.22	13.21

802.11g		Max. Rated Avg. Power + Max. Tolerance (dBm)	Average Power Output(dBm)							
CH	Frequency (MHz)		Data Rate (Mbps)							
			6	9	12	18	24	36	48	54
1	2412	15.00	13.45	13.39	13.36	13.35	13.25	13.19	13.10	13.08
6	2437	15.50	13.83	13.79	13.71	13.61	13.58	13.49	13.48	13.40
11	2462	15.00	13.42	13.34	13.30	13.23	13.19	13.09	13.08	13.01

802.11n (20M)		Max. Rated Avg. Power + Max. Tolerance (dBm)	Average Power Output(dBm)							
CH	Frequency (MHz)		Data Rate (Mbps)							
			mcs0	mcs1	mcs2	mcs3	mcs4	mcs5	mcs6	mcs7
1	2412	12.00	10.33	10.31	10.26	10.18	10.11	10.10	10.02	9.98
6	2437	12.00	10.34	10.29	10.22	10.18	10.18	10.12	10.07	10.06
11	2462	12.00	10.47	10.43	10.40	10.36	10.35	10.33	10.32	10.26

Bluetooth conducted power table:

Frequency (MHz)	Avg (dBm)		
	DH5	2DH5	3DH5
2402	4.27	4.2	4.46
2441	6.05	6.03	6.29
2480	4.7	4.74	5.05

Frequency (MHz)	Avg (dBm)
	BT4.0
2402	1.94
2442	3.85
2480	2.61

1.4 Test Environment

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

1.5 Operation Description

General:

1. The EUT is controlled by using a Radio Communication Tester (Agilent 8960 & Anritsu MT8820C), and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. Testing head SAR at lowest, middle and highest channel for all bands with Left Tilt /Left Cheek/Right Tilt/Right Cheek conditions.
5. Testing body-worn SAR by separating the EUT and the phantom **15mm** distance when performing CDMA 1xRTT/EVDO, LTE FDD/ TDD band and WiFi. (Both front side & back side)
6. Testing hotspot mode SAR by separating the EUT and the phantom **10mm** distance.
   #. The SAR testing for portable devices with wireless router capability is refered as test guidance of **KDB 941225 D06v01** (SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities).
   #. The following procedures are applicable when the overall device length and width are ≥9 cm x 5 cm respectively. A test separation of 10 mm is required. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge, for the data modes, wireless technologies and frequency bands supporting hotspot mode.

Test configurations:

(1) Front side

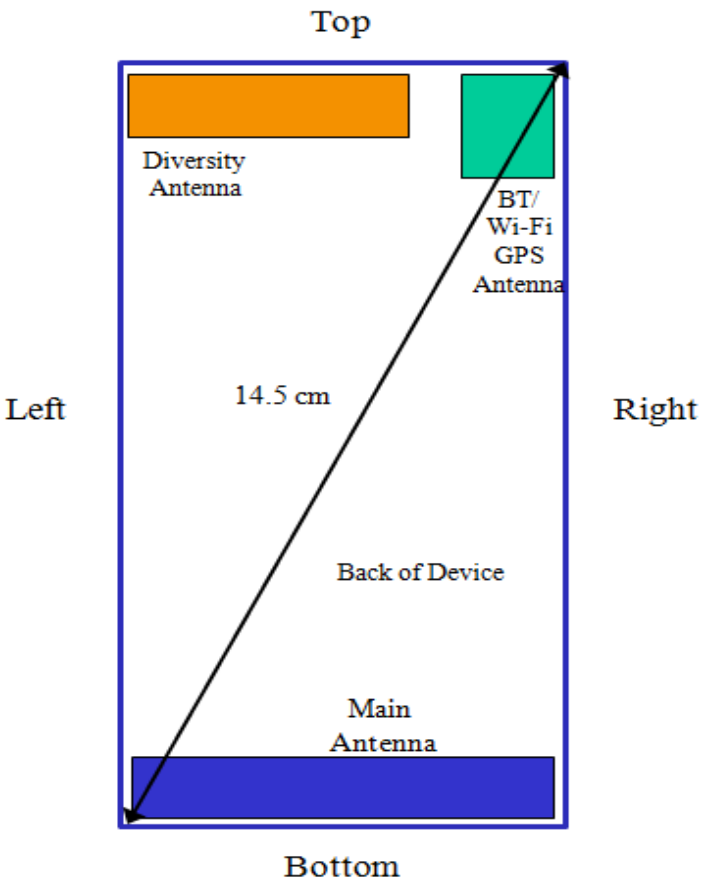
(2) Back side

(3) Top side.(WWAN antenna to edge distance >25mm_ No SAR measurement is necessary for this configuration)

(4) Bottom side. (WLAN antenna to edge distance >25mm_ No SAR measurement is necessary for this configuration)

(5) Right side.

(6) Left side. (WLAN antenna to edge distance >25mm_ No SAR measurement is necessary for this configuration)



7. According to **KDB447498 D01v05** – The 1-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances≤ 50 mm are determined by: [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, SAR evaluation is not required. **(Max power of Bluetooth = 6.29dBm)**
   When SAR evaluation is not required to be measured, per FCC KDB447498 D01v05, the following equation must be used to estimate the 1g SAR for simultaneous transmission assessment involving that transmitter.
   Estimated SAR = [√f(GHz)/7.5] · [(max. power of channel, mW)/(min. test separation distance, mm)]

Mode	Frequency (MHz)	Maximum Power (dBm)	Separation Distance (Body) (mm)	Estimated SAR 1g (Body) (W/kg)
Bluetooth	2441	6.29	15	0.059
Bluetooth	2441	6.29	10	0.089

8. According to **KDB248227 D01v01**-SAR is not required for 802.11 g/HT20/HT40 channels when the maximum average output power is higher than that measured on the corresponding 802.11b channels but increase less than 1/4 dB.
9. LTE modes test according to **FCC KDB 941225 D05v02.**
   a. Per Section 5.2.1, the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation.
   - Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
   - When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
   - When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

   b. Per Section 5.2.2, the largest channel bandwidth and measure SAR for QPSK with 50% RB allocation

- The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.

c. Per Section 5.2.3, the largest channel bandwidth and measure SAR for QPSK with 100% RB allocation

- For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg.
- Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

d. Per Section 5.2.4, Higher order modulations

- For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 5.2.1, 5.2.2 and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

e. Per Section 5.3, other channel bandwidth standalone SAR test requirements

- For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.
- The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.

10. TDD LTE was tested at highest duty factor using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633. FCC's guidance on how device is configured in TD environment is sought, and detailed with agreeable condition of setting on UE's configuration of transmission mode, and SAR test system in KDB 806089**.**
11. Based on KDB941225D01 CDMA EVDO SAR test procedure, SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev. 0 and Rev. A devices. Body SAR is measured using subtype 0/1 physical layer configurations for Rev. 0. SAR for subtype 2 physical layer configurations is not required for Rev. A when the maximum average power of each RF channels is less than that measured in subtype 0/1 physical layer configurations.
12. Based on KDB941225D01 CDMA 1xRTT SAR test procedure, SAR for body exposure configurations is measured in RC3 with the DUT configured using TDSO/SO32, to transmit at full rate on FCH with all other code channels disabled. SAR for multiple code channels(FCH+SCNn) is not required when the maximum average power is less than 1/4 dB higher than that measured with FCH only.
13. According to KDB447498 D01v05, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz.
14. According to KDB447498 D01v05, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is ≤ 0.6 W/kg, when the transmission band is between 100 MHz and 200MHz.
15. According to KDB865664 D01v01, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is ≥ 0.8 W/kg, repeated that measurement once. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit)

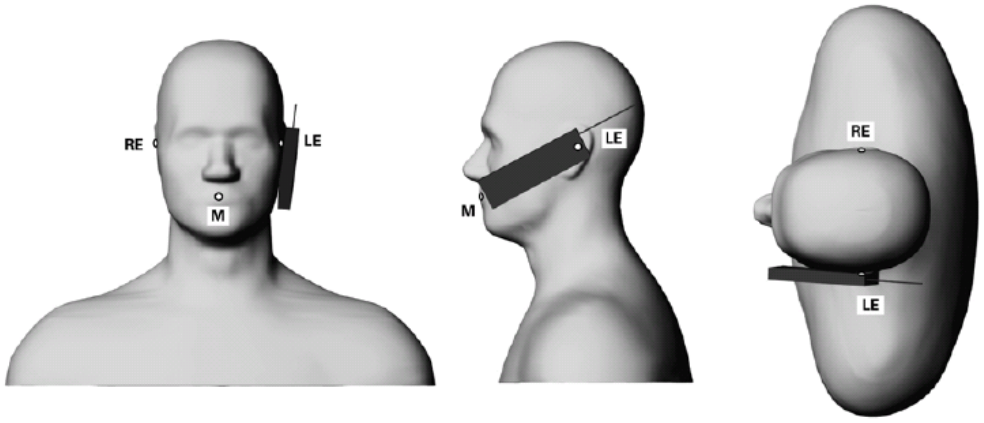
Additional configuration (Head):

16. For highest SAR configuration in this band repeated with external Memory card inside.

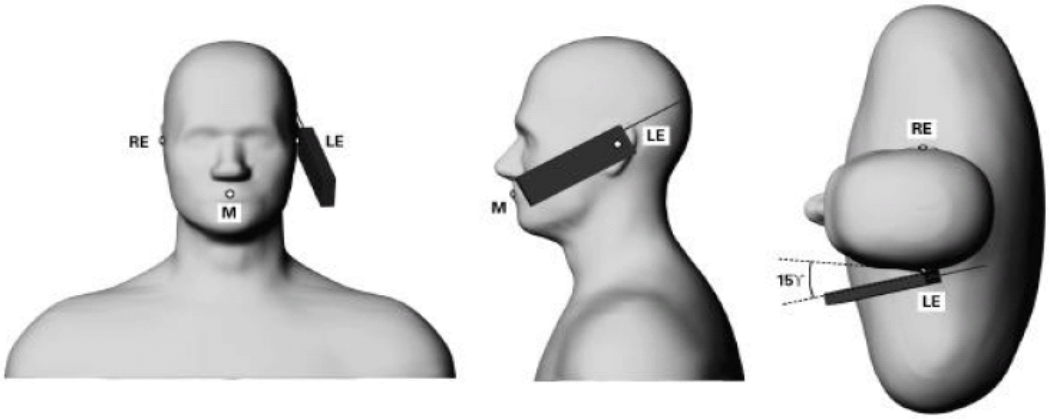
Additional configuration (Body):

17. For highest SAR configuration in this band repeated with external Memory card inside.

1.6 Positioning Procedure



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



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

Cheek/Touch Position:
The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.
Ear/Tilt Position:
With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

1.7 Evaluation Procedures

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

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

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

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

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

1.8 Probe Calibration Procedures

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

1.8.1 Transfer Calibration with Temperature Probes

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

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

Whereby σ is the conductivity, ρ the density and c the heat capacity of the liquid.

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

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

- The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.
- The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures (~ 2% for c; much better for ρ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed ±5%.
- Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

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

1.8.2 Calibration with Analytical Fields

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

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

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

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

References

[1] N. Kuster, Q. Balzano, and J.C. Lin, Eds., *Mobile Communications Safety*, Chapman & Hall, London, 1997.

[2] K. Meier, M. Burkhardt, T. Schmid, and N. Kuster, \Broadband calibration of E-field probes in lossy media", *IEEE Transactions on Microwave Theory and Techniques*, vol. 44, no. 10, pp. 1954{1962, Oct. 1996.

[3] K. Jokela, P. Hyysalo, and L. Puranen, \Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", *IEEE Transactions on Instrumentation and Measurements*, vol. 47, no. 2, pp. 432{438, Apr. 1998.

1.9 The SAR Measurement System

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

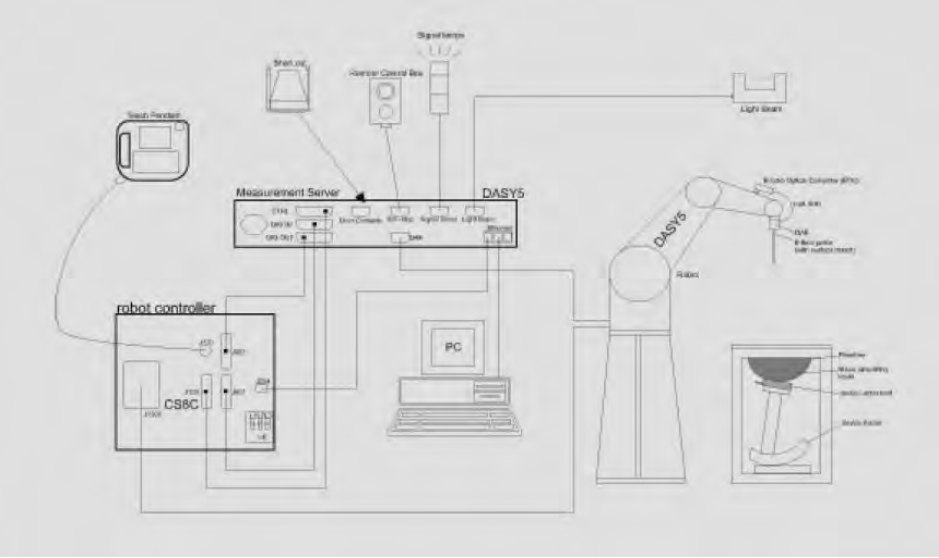


Fig. a A block diagram of the SAR measurement system

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

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows7
- DASY 5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

1.10 System Components

EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL835/1900/2450/2600MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 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)	
Dimensions	Tip diameter: 2.5 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

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: 850 mm; Length: 1000 mm; Width: 500 mm	

DEVICE HOLDER

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

1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% (according to KDB865664 D01v01) from the target SAR values.

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

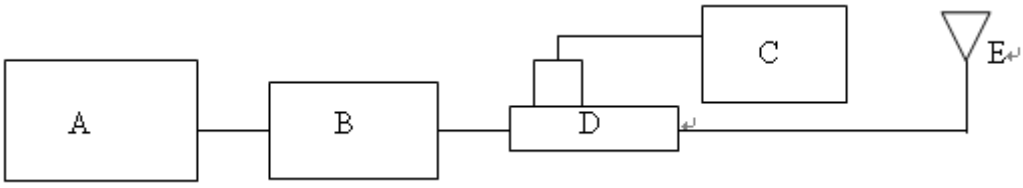


Fig. b The block diagram of system verification

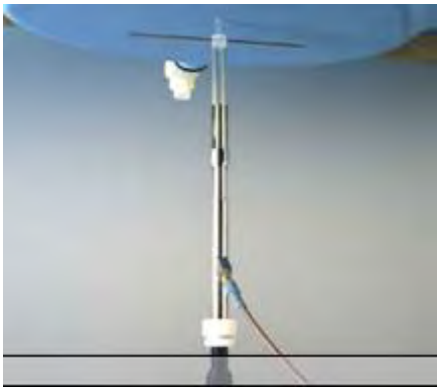
A. Signal Generator

B. Amplifier

C. Power Sensor

D. Dual Directional Coupling

E. Reference Dipole Antenna



Photograph of the Dipole Antenna

Validation Kit	S/N	Frequency (MHz)		Target SAR (1g) (Pin=250mW) (mW/g)	Measured SAR (1g)(mW/g)	Deviation (%)	Measured Date
D835V2	4d156	835	Head	2.46	2.47	-0.41%	Jun. 23, 2014
			Body	2.4	2.45	-2.08%	Jun. 24, 2014
D1900V2	5d027	1900	Head	9.71	9.64	0.72%	Jun. 25, 2014
			Body	9.87	10	-1.32%	Jun. 26, 2014
D2450V2	922	2450	Head	13.3	13.2	0.75%	Jun. 12, 2014
			Body	12.9	12.9	0.00%	
D2600V2	1005	2600	Head	14.7	14.5	1.36%	Jun. 27, 2014
			Body	14.3	14.2	0.70%	Jun. 28, 2014

Table 1. System validation (follow manufacture target value)

1.12 Tissue Simulant Fluid for the Frequency Band

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

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

Measured Frequency (MHz)	Tissue Type	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev εr	% dev σ	Measurement Date
817.9	Head	41.589	0.899	41.768	0.894	-0.43%	0.56%	Jun. 23, 2014
819		41.583	0.899	41.056	0.898	1.27%	0.11%	
820		41.578	0.899	41.866	0.897	-0.69%	0.22%	
823.1		41.562	0.899	41.875	0.907	-0.75%	-0.89%	
824.7		41.554	0.899	41.874	0.902	-0.77%	-0.33%	
831.5		41.518	0.900	41.635	0.903	-0.28%	-0.33%	
835		41.5	0.900	41.756	0.903	-0.62%	-0.33%	
836.52		41.5	0.902	41.412	0.922	0.21%	-2.22%	
844		41.5	0.910	41.481	0.917	0.05%	-0.77%	
848.31		41.5	0.914	41.393	0.921	0.26%	-0.77%	
817.9	Body	55.267	0.969	53.133	0.97	3.86%	-0.10%	Jun. 24, 2014
819		55.262	0.969	53.097	0.972	3.92%	-0.31%	
820		55.258	0.969	53.077	0.972	3.95%	-0.31%	
823.1		55.246	0.969	53.039	0.975	3.99%	-0.62%	
824.7		55.240	0.969	53.056	0.977	3.95%	-0.83%	
831.5		55.214	0.970	52.973	0.984	4.06%	-1.44%	
835		55.2	0.970	52.936	0.988	4.10%	-1.86%	
836.52		55.195	0.972	52.889	0.989	4.18%	-1.75%	
844		55.172	0.981	52.803	0.996	4.29%	-1.53%	
848.31		55.159	0.986	52.761	1.002	4.35%	-1.62%	

Measured Frequency (MHz)	Tissue Type	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev εr	% dev σ	Measurement Date
1851.25	Head	40.000	1.400	39.143	1.331	2.14%	4.93%	Jun. 25, 2014
1860		40.000	1.400	39.103	1.34	2.24%	4.29%	
1880		40.000	1.400	39.032	1.359	2.42%	2.93%	
1882.2		40.000	1.400	39.023	1.36	2.44%	2.86%	
1900		40.000	1.400	38.94	1.378	2.65%	1.57%	
1905		40.000	1.400	38.917	1.383	2.71%	1.21%	
1908.75		40.000	1.400	38.901	1.386	2.75%	1.00%	
181.25	Body	53.300	1.520	54.237	1.479	-1.76%	2.70%	Jun. 26, 2014
1860		53.300	1.520	54.206	1.489	-1.70%	2.04%	
1880		53.300	1.520	54.156	1.511	-1.61%	0.59%	
1882.2		53.300	1.520	54.148	1.513	-1.59%	0.46%	
1900		53.300	1.520	54.081	1.533	-1.47%	-0.86%	
1905		53.300	1.520	54.064	1.539	-1.43%	-1.25%	
1908.75		53.300	1.520	54.051	1.544	-1.41%	-1.58%	
2412	Head	39.268	1.766	38.334	1.746	2.38%	1.13%	Jun. 12, 2014
2437		39.223	1.788	38.248	1.772	2.49%	0.89%	
2450		39.200	1.800	38.211	1.787	2.52%	0.72%	
2462		39.185	1.813	38.168	1.8	2.60%	0.72%	
2412	Body	52.751	1.914	53.112	1.932	-0.68%	-0.94%	
2437		52.717	1.938	53.028	1.956	-0.59%	-0.93%	
2450		52.700	1.950	52.99	1.973	-0.55%	-1.18%	
2462		52.685	1.967	52.949	1.988	-0.50%	-1.07%	
2506	Head	39.129	1.861	38.604	1.923	1.34%	-3.33%	Jun. 27, 2014
2549.5		39.079	1.909	38.452	1.974	1.60%	-3.40%	
2593		39.018	1.956	38.294	2.022	1.86%	-3.37%	
2600		39.009	1.964	38.266	2.03	1.90%	-3.36%	
2636.5		38.963	2.003	38.129	2.072	2.14%	-3.44%	
2680		38.907	2.051	37.983	2.119	2.37%	-3.32%	
2506	Body	52.629	2.029	54.659	2.104	-3.86%	-3.70%	Jun. 28, 2014
2549.5		52.573	2.091	51.279	2.12	2.46%	-1.39%	
2593		52.518	2.153	51.035	2.198	2.82%	-2.09%	
2600		52.509	2.163	51.086	2.217	2.71%	-2.50%	
2636.5		52.463	2.214	51.279	2.267	2.26%	-2.39%	
2680		52.407	2.276	50.746	2.288	3.17%	-0.53%	

The composition of the brain tissue simulating liquid:

Frequency (MHz)	Mode	Ingredient						Total amount
		DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	
850	Head	—	532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
	Body	—	631.68 g	11.72 g	1.2 g	—	600 g	1.0L(Kg)
1900	Head	444.52 g	552.42 g	3.06 g	—	—	—	1.0L(Kg)
	Body	300.67 g	716.56 g	4.0 g	—	—	—	1.0L(Kg)
2450	Head	550ml	450ml	—	—	—	—	1.0L(Kg)
	Body	301.7ml	698.3ml	—	—	—	—	1.0L(Kg)
2600	Head	550ml	450ml	—	—	—	—	1.0L(Kg)
	Body	301.7ml	698.3ml	—	—	—	—	1.0L(Kg)

Table 3. Recipes for tissue simulating liquid

1.13 Test Standards and Limits

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

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

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

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

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

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

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

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

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

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

Table 4. RF exposure limits

Notes:

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

2. Summary of Results

LTE FDD Band XXV

Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 25 (Head)	20MHz	QPSK	1 RB	0	RE Cheek	-	26140	1860	24.2	23.73	11.43%	0.641	0.714	67
					RE Cheek	-	26365	1882.5	24.2	23.65	13.50%	0.593	0.673	-
					RE Cheek -With Memory Card	-	26140	1860	24.2	23.73	11.43%	0.580	0.646	-
				50	RE Cheek	-	26590	1905	24.2	23.81	9.40%	0.568	0.621	
					RE Tilt	-	26590	1905	24.2	23.81	9.40%	0.140	0.153	-
					LE Cheek	-	26590	1905	24.2	23.81	9.40%	0.388	0.424	-
					LE Tilt	-	26590	1905	24.2	23.81	9.40%	0.140	0.153	-
			50 RB	50	RE Cheek	-	26590	1905	23.2	22.86	8.14%	0.432	0.467	-
					RE Tilt	-	26590	1905	23.2	22.86	8.14%	0.105	0.114	-
					LE Cheek	-	26590	1905	23.2	22.86	8.14%	0.293	0.317	-
					LE Tilt	-	26590	1905	23.2	22.86	8.14%	0.103	0.111	-
			100 RB		RE Cheek	-	26590	1905	23.2	22.79	9.90%	0.45	0.495	-
					RE Tilt	-	26590	1905	23.2	22.79	9.90%	0.106	0.116	-
					LE Cheek	-	26590	1905	23.2	22.79	9.90%	0.308	0.338	-
					LE Tilt	-	26590	1905	23.2	22.79	9.90%	0.107	0.118	-
LTE Band 25 (Body-Worn)	20MHz	QPSK	1 RB	50	Front side	15mm	26590	1905	24.2	23.81	9.40%	0.29	0.317	-
				0	Back side	15mm	26140	1860	24.2	23.73	11.43%	0.414	0.461	68
					Front side	15mm	26365	1882.5	24.2	23.65	13.50%	0.362	0.411	
				50	Back side	15mm	26590	1905	24.2	23.81	9.40%	0.32	0.350	-
			50 RB	50	Front side	15mm	26590	1905	23.2	22.86	8.14%	0.218	0.236	-
					Back side	15mm	26590	1905	23.2	22.86	8.14%	0.234	0.253	-
			100 RB		Front side	15mm	26590	1905	23.2	22.79	9.90%	0.225	0.247	-
					Back side	15mm	26590	1905	23.2	22.79	9.90%	0.244	0.268	-
LTE Band 25 (Hotspot)	20MHz	QPSK	1 RB	50	Front side	10mm	26590	1905	24.2	23.81	9.40%	0.449	0.491	-
				0	Back side	10mm	26140	1860	24.2	23.73	11.43%	0.647	0.721	69
					Back side	10mm	26365	1882.5	24.2	23.65	13.50%	0.56	0.636	-
				50	Back side	10mm	26590	1905	24.2	23.81	9.40%	0.481	0.526	
					Bottom side	10mm	26590	1905	24.2	23.81	9.40%	0.441	0.482	-
					Right side	10mm	26590	1905	24.2	23.81	9.40%	0.376	0.411	
					Left side	10mm	26590	1905	24.2	23.81	9.40%	0.063	0.069	-
			50 RB	50	Front side	10mm	26590	1905	23.2	22.86	8.14%	0.327	0.354	-
					Back side	10mm	26590	1905	23.2	22.86	8.14%	0.351	0.380	-
					Bottom side	10mm	26590	1905	23.2	22.86	8.14%	0.328	0.355	-
					Right side	10mm	26590	1905	23.2	22.86	8.14%	0.318	0.344	
					Left side	10mm	26590	1905	23.2	22.86	8.14%	0.05	0.054	-
			100 RB		Front side	10mm	26590	1905	23.2	22.79	9.90%	0.344	0.378	-
					Back side	10mm	26590	1905	23.2	22.79	9.90%	0.366	0.402	-
					Bottom side	10mm	26590	1905	23.2	22.79	9.90%	0.342	0.376	-
					Right side	10mm	26590	1905	23.2	22.79	9.90%	0.329	0.362	
					Left side	10mm	26590	1905	23.2	22.79	9.90%	0.052	0.057	-

LTE FDD Band XXVI

Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 26 (Head)	20MHz	QPSK	1 RB	0	RE Cheek	-	26740	819	24.2	23.28	23.59%	0.294	0.363	-
					RE Cheek	-	26990	844	24.2	23.25	24.45%	0.224	0.279	-
				25	RE Cheek	-	26865	831.5	24.2	23.31	22.74%	0.366	0.449	70
					RE Tilt	-	26865	831.5	24.2	23.31	22.74%	0.280	0.344	-
					LE Cheek	-	26865	831.5	24.2	23.31	22.74%	0.202	0.248	-
					LE Tilt	-	26865	831.5	24.2	23.31	22.74%	0.105	0.129	-
			25 RB	0	RE Cheek	-	26990	844	23.2	22.34	21.90%	0.283	0.345	
					RE Tilt	-	26990	844	23.2	22.34	21.90%	0.215	0.262	
					LE Cheek	-	26990	844	23.2	22.34	21.90%	0.133	0.162	
					LE Tilt	-	26990	844	23.2	22.34	21.90%	0.075	0.091	
			50 RB		RE Cheek	-	26865	831.5	23.2	22.46	18.58%	0.293	0.347	-
					RE Tilt	-	26865	831.5	23.2	22.46	18.58%	0.225	0.267	-
					LE Cheek	-	26865	831.5	23.2	22.46	18.58%	0.161	0.191	-
					LE Tilt	-	26865	831.5	23.2	22.46	18.58%	0.085	0.101	-
LTE Band 26 (Body-Worn)	20MHz	QPSK	1 RB	25	Front side	15mm	26865	831.5	24.2	23.31	22.74%	0.281	0.345	-
				0	Back side	15mm	26740	819	24.2	23.28	23.59%	0.396	0.489	71
					Back side	15mm	26990	844	24.2	23.25	24.45%	0.331	0.412	
				25	Back side	15mm	26865	831.5	24.2	23.31	22.74%	0.332	0.408	
			25 RB	0	Front side	15mm	26990	844	23.2	22.34	21.90%	0.203	0.247	
					Back side	15mm	26990	844	23.2	22.34	21.90%	0.243	0.296	
			50 RB		Front side	15mm	26865	831.5	23.2	22.46	18.58%	0.225	0.267	-
					Back side	15mm	26865	831.5	23.2	22.46	18.58%	0.266	0.315	-
LTE Band 26 (Hotspot)	20MHz	QPSK	1 RB	25	Front side	10mm	26865	831.5	24.2	23.31	22.74%	0.397	0.487	-
				0	Back side	10mm	26740	819	24.2	23.28	23.59%	0.614	0.759	72
					Back side	10mm	26990	844	24.2	23.25	24.45%	0.533	0.663	-
				25	Back side	10mm	26865	831.5	24.2	23.31	22.74%	0.57	0.700	
					Bottom side	10mm	26865	831.5	24.2	23.31	22.74%	0.185	0.227	-
					Right side	10mm	26865	831.5	24.2	23.31	22.74%	0.236	0.290	
					Left side	10mm	26865	831.5	24.2	23.31	22.74%	0.119	0.146	-
			25 RB	0	Front side	10mm	26990	844	23.2	22.34	21.90%	0.292	0.356	
					Back side	10mm	26990	844	23.2	22.34	21.90%	0.41	0.500	
					Bottom side	10mm	26990	844	23.2	22.34	21.90%	0.148	0.180	
					Right side	10mm	26990	844	23.2	22.34	21.90%	0.162	0.197	
					Left side	10mm	26990	844	23.2	22.34	21.90%	0.086	0.105	
			50 RB		Front side	10mm	26865	831.5	23.2	22.46	18.58%	0.327	0.388	-
					Back side	10mm	26865	831.5	23.2	22.46	18.58%	0.461	0.547	-
					Bottom side	10mm	26865	831.5	23.2	22.46	18.58%	0.148	0.175	-
					Right side	10mm	26865	831.5	23.2	22.46	18.58%	0.188	0.223	
					Left side	10mm	26865	831.5	23.2	22.46	18.58%	0.096	0.114	-

LTE TDD Band XLI

Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 41 (Head)	20MHz	QPSK	1 RB	0	RE Cheek	-	41055	2636.5	24	23.55	10.92%	0.216	0.240	-
					RE Cheek	-	41490	2680	24	23.65	8.39%	0.258	0.280	73
				50	RE Cheek	-	39750	2506	23.4	23.14	6.17%	0.080	0.085	-
					RE Cheek	-	40620	2593	24	23.45	13.50%	0.190	0.216	-
				99	RE Cheek	-	40185	2549.5	24	23.41	14.55%	0.147	0.168	-
				0	RE Tilt	-	41490	2680	24	23.65	8.39%	0.163	0.177	-
					LE Cheek	-	41490	2680	24	23.65	8.39%	0.150	0.163	-
					LE Tilt		41490	2680	24	23.65	8.39%	0.145	0.157	-
			50 RB	0	RE Cheek	-	40620	2593	23	22.69	7.40%	0.150	0.161	-
					RE Tilt	-	40620	2593	23	22.69	7.40%	0.096	0.103	-
					LE Cheek	-	40620	2593	23	22.69	7.40%	0.108	0.116	-
					LE Tilt	-	40620	2593	23	22.69	7.40%	0.088	0.095	-
			100 RB		RE Cheek	-	40620	2593	23	22.64	8.64%	0.152	0.165	-
					RE Tilt	-	40620	2593	23	22.64	8.64%	0.092	0.100	-
					LE Cheek	-	40620	2593	23	22.64	8.64%	0.105	0.114	-
					LE Tilt	-	40620	2593	23	22.64	8.64%	0.088	0.096	-
LTE Band 41 (Body-Worn)	20MHz	QPSK	1 RB	0	Front side	15mm	41490	2680	24	23.65	8.39%	0.197	0.214	-
					Back side	15mm	41055	2636.5	24	23.55	10.92%	0.313	0.347	-
					Back side	15mm	41490	2680	24	23.65	8.39%	0.306	0.332	-
				50	Back side	15mm	39750	2506	23.4	23.14	6.17%	0.395	0.419	-
					Back side	15mm	40620	2593	24	23.45	13.50%	0.338	0.384	-
				99	Back side	15mm	40185	2549.5	24	23.41	14.55%	0.37	0.424	74
			50 RB	0	Front side	15mm	40620	2593	23	22.69	7.40%	0.174	0.187	-
					Back side	15mm	40620	2593	23	22.69	7.40%	0.275	0.295	-
			100 RB		Front side	15mm	40620	2593	23	22.64	8.64%	0.172	0.187	-
					Back side	15mm	40620	2593	23	22.64	8.64%	0.283	0.307	-

LTE TDD Band XLI

Mode	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 41 (Hotspot)	20MHz	QPSK	1 RB	0	Front side	10mm	41490	2680	24	23.65	8.39%	0.328	0.356	-
					Back side	10mm	41055	2636.5	24	23.55	10.92%	0.687	0.762	-
					Back side	10mm	41490	2680	24	23.65	8.39%	0.677	0.734	-
					Bottom side	10mm	41055	2636.5	24	23.55	10.92%	0.789	0.875	-
					Bottom side	10mm	41490	2680	24	23.65	8.39%	0.695	0.753	-
					Right side	10mm	41490	2680	24	23.65	8.39%	0.209	0.227	-
					Left side	10mm	41490	2680	24	23.65	8.39%	0.113	0.122	-
				50	Back side	10mm	39750	2506	23.4	23.14	6.17%	0.824	0.875	-
					Back side	10mm	40620	2593	24	23.45	13.50%	0.862	0.978	-
					Bottom side	10mm	39750	2506	23.4	23.14	6.17%	0.945	1.003	-
					Bottom side	10mm	40620	2593	24	23.45	13.50%	0.918	1.042	-
				99	Back side	10mm	40185	2549.5	24	23.41	14.55%	0.919	1.053	-
					Back side*	10mm	40185	2549.5	24	23.41	14.55%	0.892	1.022	-
					Bottom side	10mm	40185	2549.5	24	23.41	14.55%	1.07	1.226	-
					Bottom side*	10mm	40185	2549.5	24	23.41	14.55%	1.17	1.340	75
					Bottom side -with Memory Card	10mm	40185	2549.5	24	23.41	14.55%	1.05	1.203	-
			50 RB	0	Front side	10mm	40620	2593	23	22.69	7.40%	0.284	0.305	-
					Back side	10mm	39750	2506	22.4	22.15	5.93%	0.783	0.829	-
					Back side	10mm	40620	2593	23	22.69	7.40%	0.617	0.663	-
					Back side	10mm	41055	2636.5	23	22.63	8.89%	0.644	0.701	-
					Back side	10mm	41490	2680	23	22.57	10.41%	0.608	0.671	-
					Bottom side	10mm	39750	2506	22.4	22.15	5.93%	0.917	0.971	-
					Bottom side	10mm	40620	2593	23	22.69	7.40%	0.737	0.792	-
					Bottom side	10mm	41055	2636.5	23	22.63	8.89%	0.613	0.668	-
					Bottom side	10mm	41490	2680	23	22.57	10.41%	0.52	0.574	-
					Right side	10mm	40620	2593	23	22.69	7.40%	0.114	0.122	-
					Left side	10mm	40620	2593	23	22.69	7.40%	0.08	0.086	-
				50	Back side	10mm	40185	2549.5	23	22.48	12.72%	0.737	0.831	-
					Bottom side	10mm	40185	2549.5	23	22.48	12.72%	0.819	0.923	-
			100 RB		Front side	10mm	40620	2593	23	22.64	8.64%	0.28	0.304	-
					Back side	10mm	39750	2506	22.4	22.11	6.91%	0.766	0.819	-
					Back side	10mm	40185	2549.5	23	22.43	14.02%	0.733	0.836	-
					Back side	10mm	40620	2593	23	22.64	8.64%	0.613	0.666	-
					Back side	10mm	41055	2636.5	23	22.53	11.43%	0.638	0.711	-
					Back side	10mm	41490	2680	23	22.41	14.55%	0.569	0.652	-
					Bottom side	10mm	39750	2506	22.4	22.11	6.91%	1.05	1.123	-
					Bottom side	10mm	40185	2549.5	23	22.43	14.02%	0.962	1.097	-
					Bottom side	10mm	40620	2593	23	22.64	8.64%	0.696	0.756	-
					Bottom side	10mm	41055	2636.5	23	22.53	11.43%	0.675	0.752	-
					Bottom side	10mm	41490	2680	23	22.41	14.55%	0.566	0.648	-
					Right side	10mm	40620	2593	23	22.64	8.64%	0.116	0.126	-
					Left side	10mm	40620	2593	23	22.64	8.64%	0.08	0.087	-

* - repeated at the highest SAR measurement according to the FCC KDB 865664

CDMA / EVDO (BC0)

Mode		Service	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
										Measured	Reported	
CDMA _BC 0 (Head)	1xRTT	SO55 / RC3	RE Check	-	1013	824.7	24.80	23.89	23.31%	0.326	0.402	76
			RE Check	-	384	836.52	24.80	23.91	22.74%	0.313	0.384	-
			RE Check	-	777	848.31	24.80	23.89	23.31%	0.256	0.316	-
			RE Tilt	-	384	836.52	24.80	23.91	22.74%	0.132	0.162	-
			LE Cheek	-	384	836.52	24.80	23.91	22.74%	0.216	0.265	-
			LE Tilt	-	384	836.52	24.80	23.91	22.74%	0.105	0.129	-
CDMA _BC 0 (Body_Worn Speech mode)		TDSO / SO32 / FCH	Front side	15mm	384	836.52	24.80	23.92	22.46%	0.33	0.404	-
			Back side	15mm	1013	824.7	24.80	23.90	23.03%	0.439	0.540	
			Back side	15mm	384	836.52	24.80	23.92	22.46%	0.35	0.429	-
			Back side	15mm	777	848.31	24.8	23.89	23.31%	0.364	0.449	-
CDMA _BC 0 (Head)	EVDO	Rev. A FETAP / RETAP / Subtype 2	RE Check	-	1013	824.7	24.80	23.84	24.74%	0.31	0.387	78
			RE Check	-	384	836.52	24.80	23.92	22.46%	0.295	0.361	-
			RE Check	-	777	848.31	24.80	23.88	23.59%	0.234	0.289	-
			RE Tilt	-	384	836.52	24.8	23.92	22.46%	0.124	0.152	-
			LE Cheek	-	384	836.52	24.8	23.92	22.46%	0.186	0.228	-
			LE Tilt	-	384	836.52	24.8	23.92	22.46%	0.086	0.105	-
CDMA _BC 0 (Hotspot)		Rev. 0 FTAP / RTAP / Subtype 0/1	Front side	10mm	384	836.52	24.8	23.92	22.46%	0.476	0.583	-
			Back side	10mm	1013	824.7	24.8	23.88	23.59%	0.69	0.853	-
			Back side	10mm	384	836.52	24.8	23.92	22.46%	0.628	0.769	-
			Back side	10mm	777	848.31	24.8	23.89	23.31%	0.561	0.692	-
			Back side*	10mm	1013	824.7	24.8	23.88	23.59%	0.694	0.858	79
			Bottom side	10mm	384	836.52	24.8	23.92	22.46%	0.168	0.206	-
			Right side	10mm	384	836.52	24.8	23.92	22.46%	0.257	0.315	-
			Left side	10mm	384	836.52	24.8	23.92	22.46%	0.124	0.152	-

* - repeated at the highest SAR measurement according to the FCC KDB 865664

CDMA / EVDO (BC1)

Mode		Service	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
										Measured	Reported	
CDMA _BC1 (Head)	1xRTT	SO55 / RC3	RE Check	-	25	1851.25	24.80	24.17	15.61%	0.795	0.919	80
			RE Check	-	600	1880	24.80	24.22	14.29%	0.738	0.843	-
			RE Check	-	1175	1908.75	24.80	24.13	16.68%	0.676	0.789	-
			RE Tilt	-	600	1880	24.80	24.22	14.29%	0.208	0.238	-
			LE Cheek	-	600	1880	24.80	24.22	14.29%	0.443	0.506	-
			LE Tilt	-	600	1880	24.80	24.22	14.29%	0.205	0.234	-
			RE Check*	-	25	1851.25	24.80	24.17	15.61%	0.793	0.917	-
CDMA _BC1 (Body_Worn Speech mode)		TDSO / SO32 / FCH	Front side	15mm	25	1851.25	24.80	24.20	14.82%	0.441	0.506	-
			Front side	15mm	600	1880	24.80	24.22	14.29%	0.555	0.634	81
			Front side	15mm	1175	1908.75	24.80	24.17	15.61%	0.347	0.401	-
			Back side	15mm	600	1880	24.80	24.22	14.29%	0.537	0.614	-
CDMA _BC1 (Head)	EVDO	Rev. A FETAP / RETAP / Subtype 2	RE Check	-	25	1851.25	24.80	24.07	18.30%	0.793	0.938	82
			RE Check	-	600	1880	24.80	24.16	15.88%	0.731	0.847	-
			RE Check	-	1175	1908.75	24.80	24.08	18.03%	0.632	0.746	-
			RE Check*	-	25	1851.25	24.80	24.07	18.30%	0.778	0.920	-
			RE Check -with Memory Card	-	25	1851.25	24.80	24.07	18.30%	0.739	0.874	-
			RE Tilt	-	600	1880	24.80	24.16	15.88%	0.208	0.241	-
			LE Cheek	-	600	1880	24.80	24.16	15.88%	0.447	0.518	-
			LE Tilt	-	600	1880	24.80	24.16	15.88%	0.216	0.250	-
CDMA _BC1 (Hotspot)		Rev. 0 FTAP / RTAP / Subtype 0/1	Front side	10mm	600	1880	24.8	24.11	17.22%	0.584	0.685	-
			Back side	10mm	25	1851.25	24.8	24.11	17.22%	0.658	0.771	83
			Back side	10mm	600	1880	24.8	24.11	17.22%	0.609	0.714	-
			Back side	10mm	1175	1908.75	24.8	24.08	18.03%	0.541	0.639	-
			Bottom side	10mm	600	1880	24.8	24.11	17.22%	0.544	0.638	-
			Right side	10mm	600	1880	24.8	24.11	17.22%	0.48	0.563	-
			Left side	10mm	600	1880	24.8	24.11	17.22%	0.082	0.096	-

* - repeated at the highest SAR measurement according to the FCC KDB 865664

CDMA / EVDO BC10

Mode		Service	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
										Measured	Reported	
CDMABC10 (Head)	1xRTT	SO55 / RC3	RE Check	-	476	817.9	24.80	23.90	23.03%	0.333	0.410	84
			RE Check	-	560	820	24.80	23.90	23.03%	0.329	0.405	-
			RE Check	-	684	823.1	24.80	23.85	24.45%	0.322	0.401	-
			RE Tilt	-	560	820	24.80	23.90	23.03%	0.122	0.150	-
			LE Cheek	-	560	820	24.80	23.90	23.03%	0.245	0.301	-
			LE Tilt	-	560	820	24.80	23.90	23.03%	0.104	0.128	-
CDMA BC10 (Body_Worn Speech mode)	1xRTT	TDSO / SO32 / FCH	Front side	15mm	684	823.1	24.80	23.91	22.74%	0.35	0.430	-
			Back side	15mm	476	817.9	24.80	23.89	23.31%	0.455	0.561	85
			Back side	15mm	560	820	24.80	23.89	23.31%	0.453	0.559	-
			Back side	15mm	684	823.1	24.8	23.91	22.74%	0.443	0.544	-
CDMA BC10 (Head)	EVDO	Rev. A FETAP / RETAP / Subtype 2	RE Check	-	476	817.9	24.80	23.71	28.53%	0.281	0.361	-
			RE Check	-	560	820	24.80	23.67	29.72%	0.28	0.363	86
			RE Check	-	684	823.1	24.80	23.66	30.02%	0.272	0.354	-
			RE Tilt	-	476	817.9	24.80	23.71	28.53%	0.105	0.135	-
			LE Cheek	-	476	817.9	24.80	23.71	28.53%	0.221	0.284	-
			LE Tilt	-	476	817.9	24.80	23.71	28.53%	0.096	0.123	-
CDMA BC10 (Hotspot)	EVDO	Rev. 0 FTAP / RTAP / Subtype 0/1	Front side	10mm	560	820	24.8	23.7	28.82%	0.531	0.684	-
			Back side	10mm	476	817.9	24.8	23.66	30.02%	0.718	0.934	-
			Back side	10mm	560	820	24.8	23.7	28.82%	0.715	0.921	-
			Back side	10mm	684	823.1	24.8	23.66	30.02%	0.699	0.909	-
			Back side*	10mm	476	817.9	24.8	23.66	30.02%	0.721	0.937	87
			Back side -with Memory Card	10mm	476	817.9	24.8	23.66	30.02%	0.691	0.898	-
			Bottom side	10mm	820	560	24.8	23.7	0.2882	0.154	0.198	-
			Right side	10mm	820	560	24.8	23.7	0.2882	0.279	0.359	-
			Left side	10mm	820	560	24.8	23.7	0.2882	0.155	0.200	-

* - repeated at the highest SAR measurement according to the FCC KDB 865664

WLAN802.11 b

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
Head	RE Cheek	-	6	2437	15.5	14.11	37.72%	0.062	0.085	-
	RE Tilt	-	6	2437	15.5	14.11	37.72%	0.071	0.098	-
	LE Cheek	-	6	2437	15.5	14.11	37.72%	0.056	0.077	-
	LE Tilt	-	1	2412	15	13.42	43.88%	0.054	0.078	-
	LE Tilt	-	6	2437	15.5	14.11	37.72%	0.073	0.101	88
	LE Tilt	-	11	2462	15	13.33	46.89%	0.066	0.097	-
Body_Worn	Front side	15mm	6	2437	15.5	14.11	37.72%	0.011	0.015	-
	Back side	15mm	1	2412	15	13.42	43.88%	0.021	0.030	-
	Back side	15mm	6	2437	15.5	14.11	37.72%	0.035	0.048	89
	Back side	15mm	11	2462	15	13.33	46.89%	0.024	0.035	-
Hotspot	Front side	10mm	6	2437	15.5	14.11	37.72%	0.017	0.023	-
	Back side	10mm	1	2412	15	13.42	43.88%	0.076	0.109	-
	Back side	10mm	6	2437	15.5	14.11	37.72%	0.108	0.149	90
	Back side	10mm	11	2462	15	13.33	46.89%	0.101	0.148	-
	Top side	10mm	6	2437	15.5	14.11	37.72%	0.065	0.090	-
	Right side	10mm	6	2437	15.5	14.11	37.72%	0.00752	0.010	-

3. Simultaneous Tramsmission Analysis

Simultaneous Tramsmission Scenarios:

Simultaneous Transmit Configurations	Head	Body-Worn	Hot Spot
LTE FDD B25/B26/B41 + 2.4GHz Wi-Fi	Yes	Yes	Yes
1xRTT BC0/BC1/BC10 + 2.4GHz Wi-Fi	Yes	Yes	No
EVDO BC0/BC1/BC10 + 2.4GHz Wi-Fi	Yes	No	Yes
LTE FDD B25/B26/B41 + 2.4GHz Bluetooth	No	Yes	Yes
1xRTT BC0/BC1/BC10 + 2.4GHz Bluetooth	No	Yes	No
EVDO BC0/BC1/BC10 + 2.4GHz Bluetooth	No	No	Yes

Notes:
1. CDMA & LTE share the same antenna path and cannot transmit simultaneously
2. Bluetooth and 2.4GHz WiFi share the same antenna path and cannot transmit simultaneously

Simultaneous Transmission Combination

reported SAR WWAN and WLAN DTS 2.4GHz, ΣSAR evaluation							
Frequency band	Position		reported SAR / W/kg		ΣSAR	Calculated distance (mm)	SPLSR (≦0.04)
			WWAN	WLAN	<1.6W/kg		
LTE FDD Band 25	Head	Right cheek	0.714	0.085	0.799	-	-
		Right tilt	0.153	0.098	0.251	-	-
		Left cheek	0.424	0.077	0.501	-	-
		Left tilt	0.153	0.101	0.254	-	-
	Body-Worn	Front	0.411	0.015	0.426	-	-
		Back	0.461	0.048	0.509	-	-
	Hotspot	Front	0.491	0.023	0.514	-	-
		Back	0.721	0.149	0.870	-	-
		Top	-	0.090	-	-	-
		Bottom	0.482	-	-	-	-
		Right	0.411	0.010	0.421	-	-
		Left	0.069	-	-	-	-
LTE FDD Band 26	Head	Right cheek	0.449	0.085	0.534	-	-
		Right tilt	0.344	0.098	0.442	-	-
		Left cheek	0.248	0.077	0.325	-	-
		Left tilt	0.129	0.101	0.230	-	-
	Body-Worn	Front	0.345	0.015	0.360	-	-
		Back	0.489	0.048	0.537	-	-
	Hotspot	Front	0.487	0.023	0.510	-	-
		Back	0.759	0.149	0.908	-	-
		Top	-	0.090	-	-	-
		Bottom	0.227	-	-	-	-
		Right	0.290	0.010	0.300	-	-
		Left	0.146	-	-	-	-
LTE TDD Band 41	Head	Right cheek	0.280	0.085	0.365	-	-
		Right tilt	0.177	0.098	0.275	-	-
		Left cheek	0.163	0.077	0.240	-	-
		Left tilt	0.157	0.101	0.258	-	-
	Body-Worn	Front	0.214	0.015	0.229	-	-
		Back	0.424	0.048	0.472	-	-
	Hotspot	Front	0.356	0.023	0.379	-	-
		Back	1.053	0.149	1.202	-	-
		Top	-	0.090	-	-	-
		Bottom	1.340	-	-	-	-
		Right	0.227	0.010	0.237	-	-
		Left	0.122	-	-	-	-

reported SAR WWAN and WLAN DTS 2.4GHz, ΣSAR evaluation							
Frequency band	Position		reported SAR / W/kg		ΣSAR	Calculated distance (mm)	SPLSR (≦0.04)
			WWAN	WLAN	<1.6W/kg		
CDMA BC0	Head	Right cheek	0.402	0.085	0.487	-	-
		Right tilt	0.162	0.098	0.260	-	-
		Left cheek	0.265	0.077	0.342	-	-
		Left tilt	0.129	0.101	0.230	-	-
	Body-Worn	Front	0.404	0.015	0.419	-	-
		Back	0.540	0.048	0.588	-	-
CDMA BC1	Head	Right cheek	0.919	0.085	1.004	-	-
		Right tilt	0.238	0.098	0.336	-	-
		Left cheek	0.506	0.077	0.583	-	-
		Left tilt	0.234	0.101	0.335	-	-
	Body-Worn	Front	0.634	0.015	0.649	-	-
		Back	0.614	0.048	0.662	-	-
CDMA BC10	Head	Right cheek	0.410	0.085	0.495	-	-
		Right tilt	0.150	0.098	0.248	-	-
		Left cheek	0.301	0.077	0.378	-	-
		Left tilt	0.128	0.101	0.229	-	-
	Body-Worn	Front	0.430	0.015	0.445	-	-
		Back	0.561	0.048	0.609	-	-

reported SAR WWAN and WLAN DTS 2.4GHz, ΣSAR evaluation							
Frequency band	Position		reported SAR / W/kg		ΣSAR	Calculated distance (mm)	SPLSR (≦0.04)
			WWAN	WLAN	<1.6W/kg		
EVDO BC0	Head	Right cheek	0.387	0.085	0.472	-	-
		Right tilt	0.152	0.098	0.250	-	-
		Left cheek	0.228	0.077	0.305	-	-
		Left tilt	0.105	0.101	0.206	-	-
	Hotspot	Front	0.583	0.023	0.606	-	-
		Back	0.858	0.149	1.007	-	-
		Top	-	0.090	-	-	-
		Bottom	0.206	-	-	-	-
		Right	0.315	0.010	0.325	-	-
		Left	0.152	-	-	-	-
EVDO BC1	Head	Right cheek	0.938	0.085	1.023	-	-
		Right tilt	0.241	0.098	0.339	-	-
		Left cheek	0.518	0.077	0.595	-	-
		Left tilt	0.250	0.101	0.351	-	-
	Hotspot	Front	0.685	0.023	0.708	-	-
		Back	0.771	0.149	0.920	-	-
		Top	-	0.090	-	-	-
		Bottom	0.638	-	-	-	-
		Right	0.563	0.010	0.573	-	-
		Left	0.096	-	-	-	-
EVDO BC10	Head	Right cheek	0.363	0.085	0.448	-	-
		Right tilt	0.135	0.098	0.233	-	-
		Left cheek	0.284	0.077	0.361	-	-
		Left tilt	0.123	0.101	0.224	-	-
	Hotspot	Front	0.684	0.023	0.707	-	-
		Back	0.937	0.149	1.086	-	-
		Top	-	0.090	-	-	-
		Bottom	0.198	-	-	-	-
		Right	0.359	0.010	0.369	-	-
		Left	0.200	-	-	-	-

reported SAR WWAN and Bluetooth, ΣSAR evaluation							
Frequency band	Position		reported SAR / W/kg		ΣSAR	Calculated distance (mm)	SPLSR (≦0.04)
			WWAN	Bluetooth	<1.6W/kg		
LTE FDD Band 25	Body-Worn	Front	0.411	0.059	0.470	-	-
		Back	0.461	0.059	0.520	-	-
	Hotspot	Front	0.491	0.089	0.580	-	-
		Back	0.721	0.089	0.810	-	-
		Top	-	0.089	-	-	-
		Bottom	0.482	-	-	-	-
		Right	0.411	0.089	0.500	-	-
		Left	0.069	-	-	-	-
LTE FDD Band 26	Body-Worn	Front	0.345	0.059	0.404	-	-
		Back	0.489	0.059	0.548	-	-
	Hotspot	Front	0.487	0.089	0.576	-	-
		Back	0.759	0.089	0.848	-	-
		Top	-	0.089	-	-	-
		Bottom	0.227	-	-	-	-
		Right	0.290	0.089	0.379	-	-
		Left	0.146	-	-	-	-
LTE TDD Band 41	Body-Worn	Front	0.214	0.059	0.273	-	-
		Back	0.424	0.059	0.483	-	-
	Hotspot	Front	0.356	0.089	0.445	-	-
		Back	1.053	0.089	1.142	-	-
		Top	-	0.089	-	-	-
		Bottom	1.340	-	-	-	-
		Right	0.227	0.089	0.316	-	-
		Left	0.122	-	-	-	-

reported SAR WWAN and Bluetooth, ΣSAR evaluation							
Frequency band	Position		reported SAR / W/kg		ΣSAR	Calculated distance (mm)	SPLSR (≦0.04)
			WWAN	Bluetooth	<1.6W/kg		
CDMA BC0	Body-Worn	Front	0.404	0.059	0.463	-	-
		Back	0.540	0.059	0.599	-	-
CDMA BC1	Body-Worn	Front	0.634	0.059	0.693	-	-
		Back	0.614	0.059	0.673	-	-
CDMA BC10	Body-Worn	Front	0.430	0.059	0.489	-	-
		Back	0.561	0.059	0.620	-	-
EVDO BC0	Hotspot	Front	0.583	0.089	0.672	-	-
		Back	0.858	0.089	0.947	-	-
		Top	-	0.089	-	-	-
		Bottom	0.206	-	-	-	-
		Right	0.315	0.089	0.404	-	-
		Left	0.152	-	-	-	-
EVDO BC1	Hotspot	Front	0.685	0.089	0.774	-	-
		Back	0.771	0.089	0.860	-	-
		Top	-	0.089	-	-	-
		Bottom	0.638	-	-	-	-
		Right	0.563	0.089	0.652	-	-
		Left	0.096	-	-	-	-
EVDO BC10	Hotspot	Front	0.684	0.089	0.773	-	-
		Back	0.937	0.089	1.026	-	-
		Top	-	0.089	-	-	-
		Bottom	0.198	-	-	-	-
		Right	0.359	0.089	0.448	-	-
		Left	0.200	-	-	-	-

4. Instruments List

Device	Manufacturer	Type	Serial number	Date of last calibration	Date of next calibration
Dosimetric E-Field Probe	Schmid & Partner Engineering AG	EX3DV4	3848	Apr.24,2014	Apr.23,2015
835/1900/2450/2600 System Validation Dipole	Schmid & Partner Engineering AG	D835V2	4d161	Nov.01,2013	Oct.31,2014
		D1900V2	5d027	Apr.23,2014	Apr.22,2015
		D2450V2	922	Nov.05,2013	Nov.04,2014
		D2600V2	1005	Jan.28,2014	Jan.27,2015
Data acquisition Electronics	Schmid & Partner Engineering AG	DAE4	1336	Sep.24,2013	Sep.23,2014
Software	Schmid & Partner Engineering AG	DASY 52 V52.8.7	N/A	Calibration not required	Calibration not required
Phantom	Schmid & Partner Engineering AG	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	Agilent	E5071C	MY46107530	Feb.14,2014	Feb.13,2015
Dielectric Probe Kit	Agilent	85070E	MY44300677	Calibration not required	Calibration not required
Dual-directional coupler	Agilent	772D	MY52180142	Sep.19,2013	Sep.18,2014
		778D	MY48220468	Apr.01,2014	Mar.31,2015
RF Signal Generator	Agilent	N5181A	MY50141235	Dec.14,2013	Dec.13,2016
Power Meter	Agilent	E4417A	MY51410006	Oct.25,2013	Oct.24,2015
Power Sensor	Agilent	E9301H	MY51470001	Dec.16,2013	Dec.15,2014
Radio Communication Test	Agilent	E5515C	GB44051912	Jul.25.2012	Jul.24.2014
Radio Communication Test	Anritsu	MT8820C	6201061049	Sep.18,2013	Sep.17,2014
TECPEL	Digital thermometer	DTM-303A	TP130074	Mar.20,2014	Mar.19,2015

5. Measurements

Date: 2014/6/25

LTE B25 (20MHz)_Head_RE Cheek_CH 26140_QPSK_1-0

Communication System: LTE Band 25(20M); Frequency: 1860 MHz

Medium parameters used: f = 1860 MHz; σ = 1.34 S/m; ε_r = 39.103; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.65, 7.65, 7.65); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom:Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

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

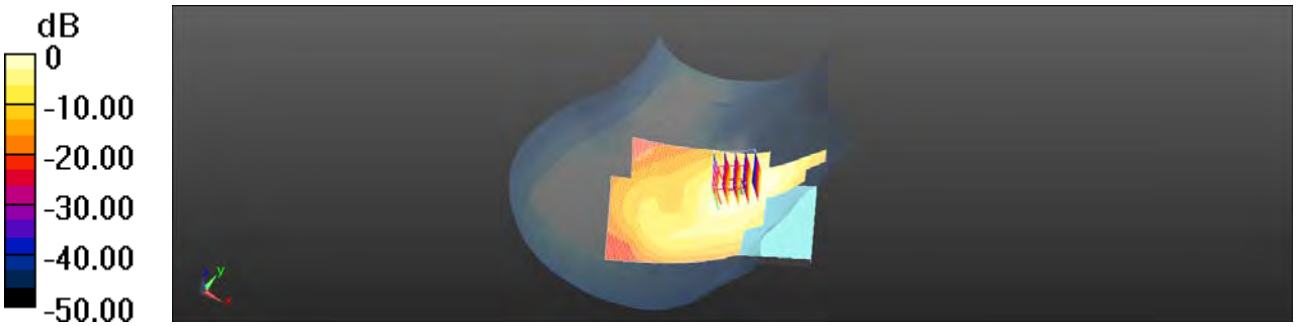
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.041 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.999 W/kg

SAR(1 g) = 0.641 W/kg; SAR(10 g) = 0.396 W/kg

Maximum value of SAR (measured) = 0.796 W/kg



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

Date: 2014/6/26

LTE B25 (20MHz)_Body-Worn_Back side_CH 26140_QPSK_1-0

Communication System: LTE Band 25(20M) ; Frequency: 1860 MHz

Medium parameters used: f = 1860 MHz; σ = 1.489 S/m; ε_r = 54.206; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.29, 7.29, 7.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.533 W/kg

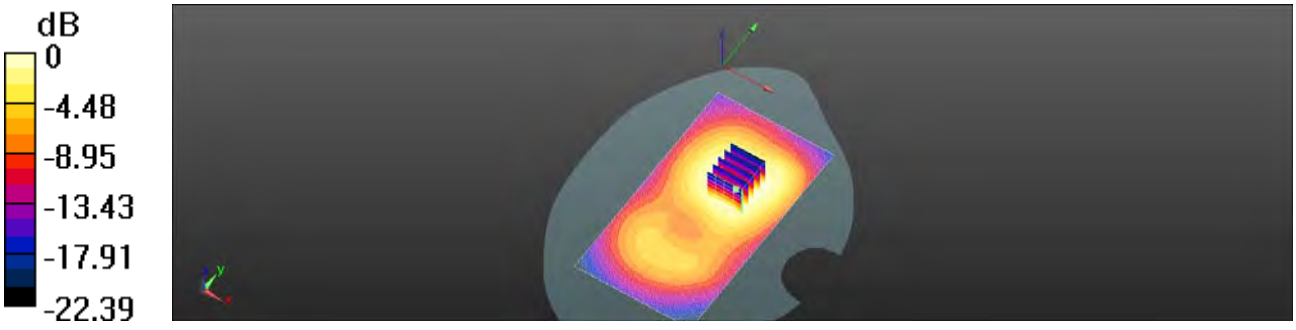
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.769 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.632 W/kg

SAR(1 g) = 0.414 W/kg; SAR(10 g) = 0.263 W/kg

Maximum value of SAR (measured) = 0.527 W/kg



0 dB = 0.533 W/kg = -2.74 dBW/kg

Date: 2014/6/26

LTE B25 (20MHz)_Hotspot mode_Back side_CH 26140_QPSK_1-0

Communication System: LTE Band 25(20M) ; Frequency: 1860 MHz

Medium parameters used: f = 1860 MHz; σ = 1.489 S/m; ε_r = 54.206; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.29, 7.29, 7.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.867 W/kg

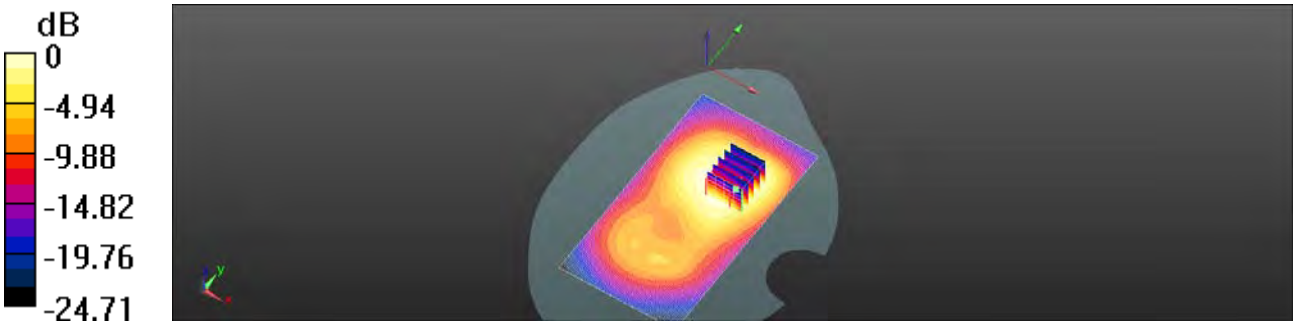
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.874 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.647 W/kg; SAR(10 g) = 0.402 W/kg

Maximum value of SAR (measured) = 0.827 W/kg



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

Date: 2014/6/23

LTE B26 (10MHz)_Head_RE Cheek_CH 26865_QPSK_1-25

Communication System: LTE Band 26 (10M); Frequency: 831.5 MHz

Medium parameters used : f = 831.5 MHz; σ = 0.903 S/m; ε_r = 41.635; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.19, 9.19, 9.19); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom:Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.423 W/kg

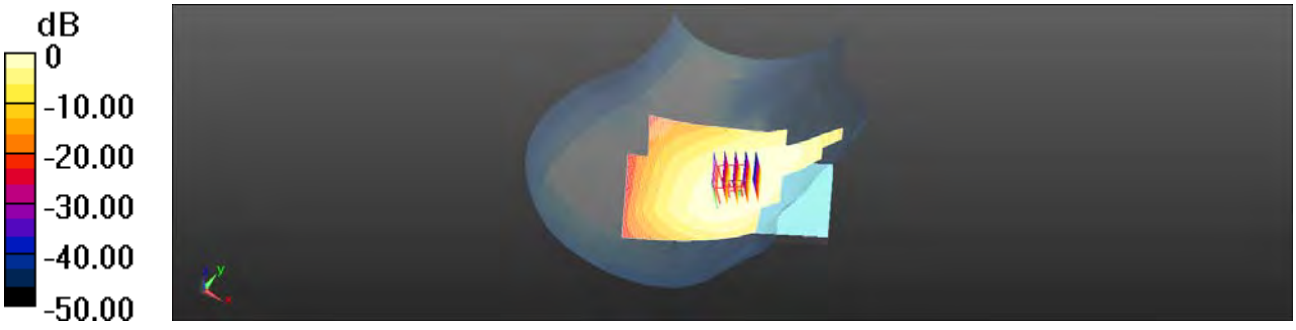
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.306 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.455 W/kg

SAR(1 g) = 0.366 W/kg; SAR(10 g) = 0.282 W/kg

Maximum value of SAR (measured) = 0.415 W/kg



0 dB = 0.423 W/kg = -3.74 dBW/kg

Date: 2014/6/24

LTE B26 (10MHz)_Body-Worn_Back side_CH 26740_QPSK_1-0

Communication System: LTE Band 26 (10M) ; Frequency: 819 MHz

Medium parameters used: f = 819 MHz; σ = 0.972 S/m; ε_r = 53.097; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.487 W/kg

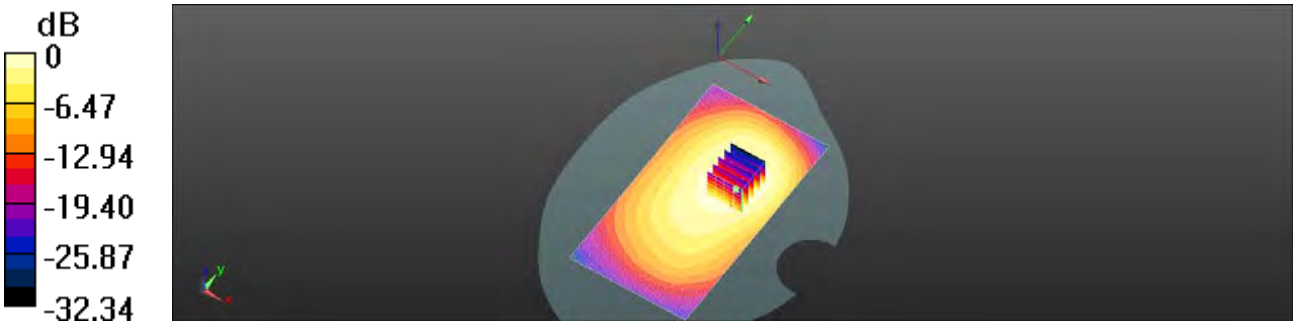
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.825 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.599 W/kg

SAR(1 g) = 0.396 W/kg; SAR(10 g) = 0.267 W/kg

Maximum value of SAR (measured) = 0.497 W/kg



0 dB = 0.487 W/kg = -3.13 dBW/kg

Date: 2014/6/24

LTE B26 (10MHz)_Hotspot mode_Back side_CH 26740_QPSK_1-0

Communication System: LTE Band 26 (10M); Frequency: 819 MHz

Medium parameters used: f = 819 MHz; σ = 0.972 S/m; ε_r = 53.097; ρ = 1000 kg/m^3

Phantom section: Flat Section

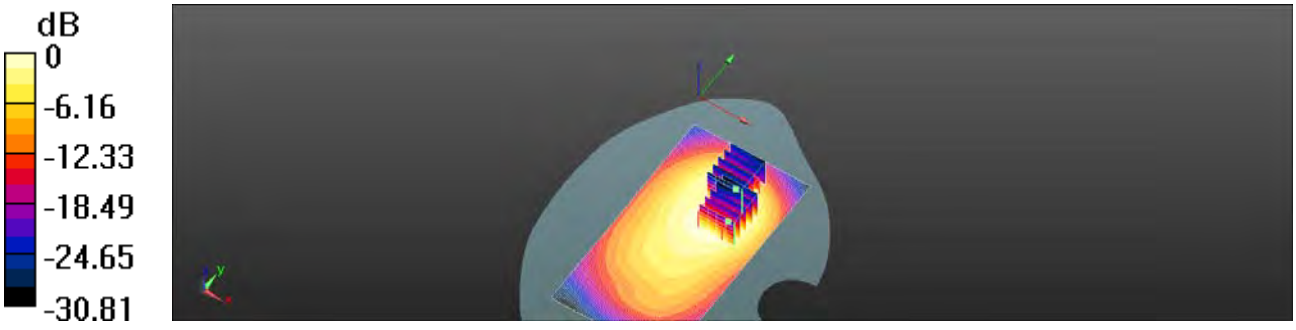
DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x131x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.774 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.450 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.998 W/kg
SAR(1 g) = 0.614 W/kg; SAR(10 g) = 0.374 W/kg
Maximum value of SAR (measured) = 0.787 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.450 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.970 W/kg
SAR(1 g) = 0.491 W/kg; SAR(10 g) = 0.266 W/kg
Maximum value of SAR (measured) = 0.702 W/kg



0 dB = 0.774 W/kg = -1.12 dBW/kg

Date: 2014/6/27

LTE B41 (20MHz)_Head_RE Cheek_CH 41490_QPSK_1-0

Communication System: LTE Band 41 (20M) TDD ; Frequency: 2680 MHz

Medium parameters used: f = 2680 MHz; σ = 2.119 S/m; ε_r = 37.983; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.71, 6.71, 6.71); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom:Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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

Maximum value of SAR (interpolated) = 0.373 W/kg

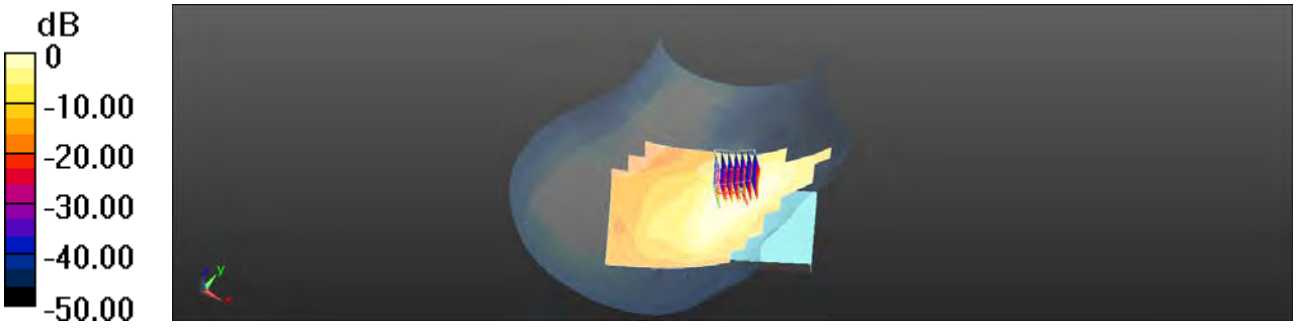
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.300 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.516 W/kg

SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.135 W/kg

Maximum value of SAR (measured) = 0.374 W/kg



0 dB = 0.373 W/kg = -4.28 dBW/kg

Date: 2014/6/28

LTE B41 (20MHz)_Body-Worn_Back side_CH 40185_QPSK_1-99

Communication System: LTE Band 41 (20M) TDD ; Frequency: 2549.5 MHz

Medium parameters used : f = 2549.5 MHz; σ = 2.12 S/m; ε_r = 51.279; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.7, 6.7, 6.7); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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

Maximum value of SAR (interpolated) = 0.551 W/kg

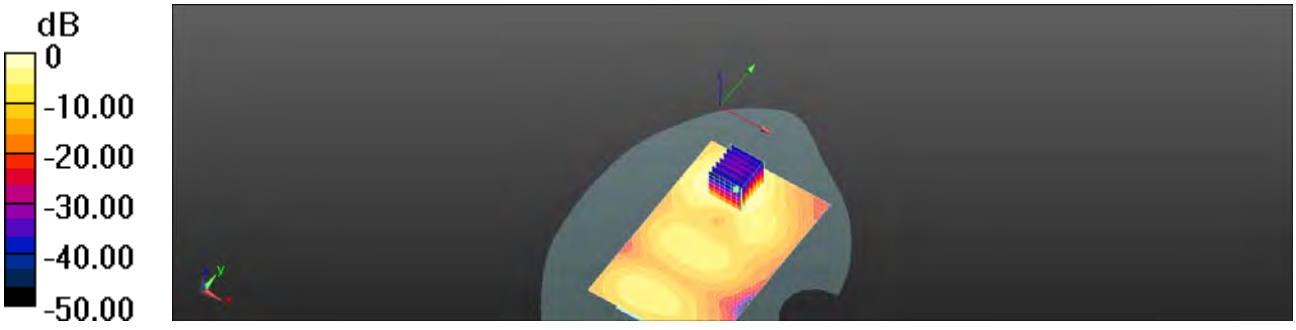
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.899 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.771 W/kg

SAR(1 g) = 0.370 W/kg; SAR(10 g) = 0.180 W/kg

Maximum value of SAR (measured) = 0.557 W/kg



0 dB = 0.551 W/kg = -2.59 dBW/kg

Date: 2014/6/28

LTE B41 (20MHz)_Hotspot mode_Bottom side_CH 40185_QPSK_1-99_repeat sar test at the highest sar measurement

Communication System: LTE Band 41 (20M) TDD ; Frequency: 2549.5 MHz

Medium parameters used : f = 2549.5 MHz; σ = 2.12 S/m; ε_r = 51.279; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.7, 6.7, 6.7); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (61x81x1): Interpolated grid: dx=12 mm, dy=12 mm

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

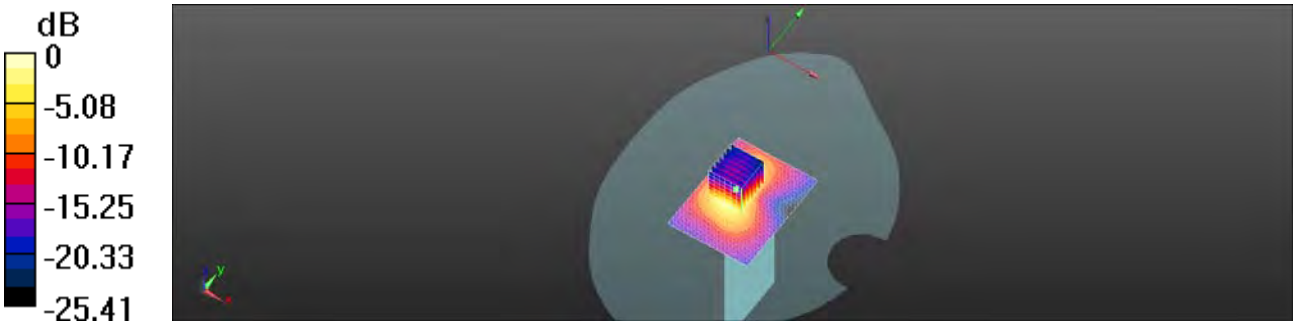
Configuration/Body/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.126 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.60 W/kg

SAR(1 g) = 1.17 W/kg; SAR(10 g) = 0.524 W/kg

Maximum value of SAR (measured) = 1.85 W/kg



0 dB = 1.87 W/kg = 2.71 dBW/kg

Date: 2014/6/23

CDMA BC0_Head_RE Cheek_CH 1013

Communication System: CDMA ; Frequency: 824.7 MHz

Medium parameters used: f = 825 MHz; σ = 0.902 S/m; ε_r = 41.874; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.19, 9.19, 9.19); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.406 W/kg

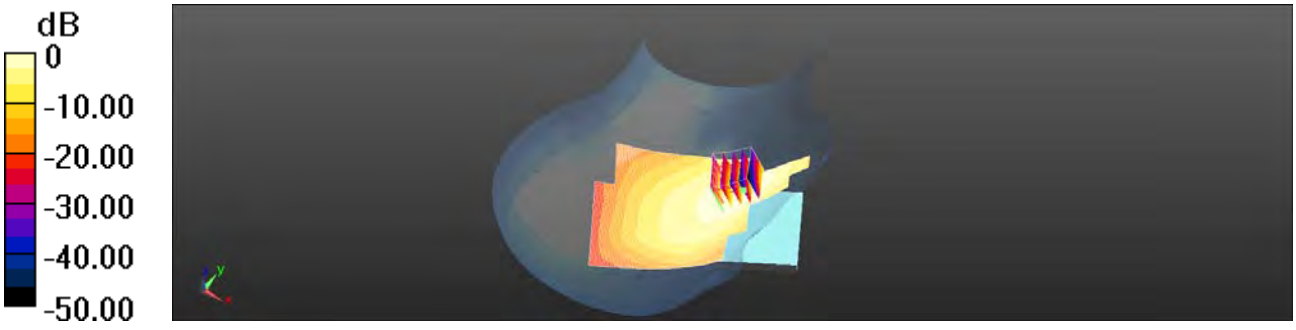
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.058 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.463 W/kg

SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.213 W/kg

Maximum value of SAR (measured) = 0.401 W/kg



0 dB = 0.406 W/kg = -3.91 dBW/kg

ate: 2014/6/24

CDMA BC0_Body-worn_Back side_CH 1013

Communication System: CDMA; Frequency: 824.7 MHz

Medium parameters used: f = 825 MHz; σ = 0.977 S/m; ε_r = 53.056; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.562 W/kg

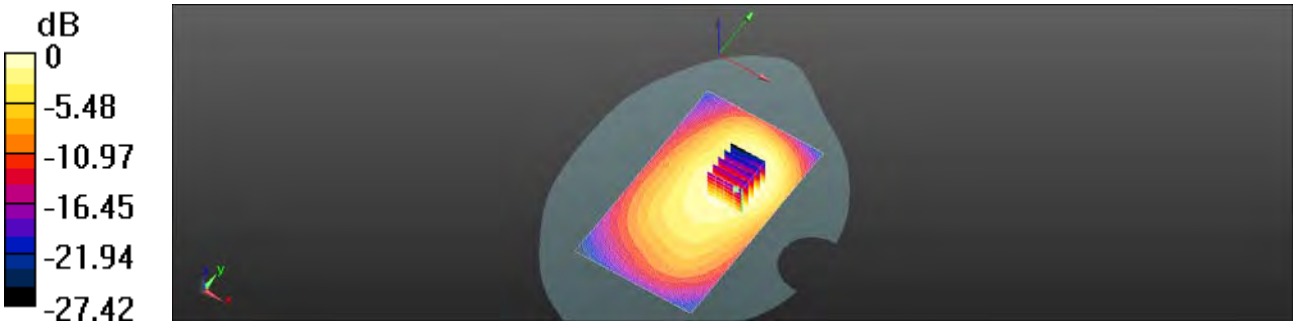
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.413 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.665 W/kg

SAR(1 g) = 0.439 W/kg; SAR(10 g) = 0.292 W/kg

Maximum value of SAR (measured) = 0.554 W/kg



0 dB = 0.562 W/kg = -2.50 dBW/kg

Date: 2014/6/23

EVDO BC0_Head_RE Check_CH 1013_Rev A

Communication System: 1xEVDO ; Frequency: 824.7 MHz

Medium parameters used: f = 825 MHz; σ = 0.902 S/m; ε_r = 41.874; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.19, 9.19, 9.19); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.376 W/kg

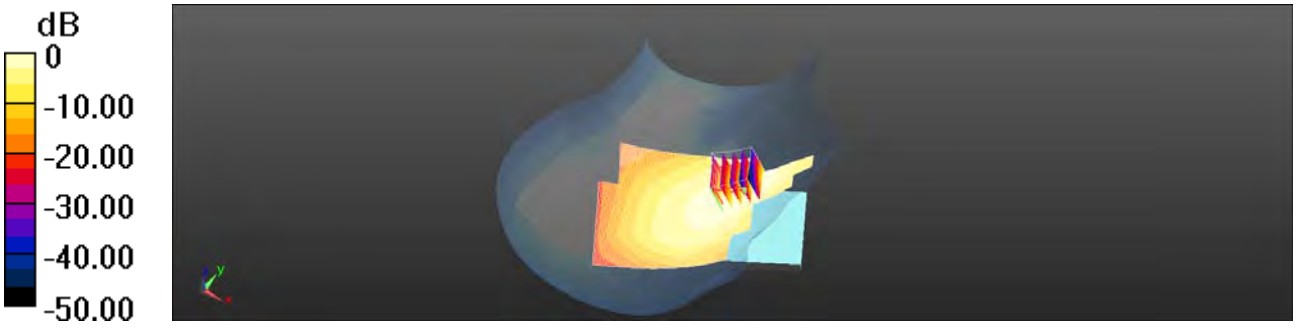
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.919 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.445 W/kg

SAR(1 g) = 0.310 W/kg; SAR(10 g) = 0.209 W/kg

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



0 dB = 0.376 W/kg = -4.25 dBW/kg

Date: 2014/6/24

EVDO BC0_Hotspot mode_Back side_CH 1013_Rev 0_repeat sar test at the highest sar measurement

Communication System: 1xEVDO; Frequency: 824.7 MHz

Medium parameters used: f = 825 MHz; σ = 0.977 S/m; ε_r = 53.056; ρ = 1000 kg/m^3

Phantom section: Flat Section

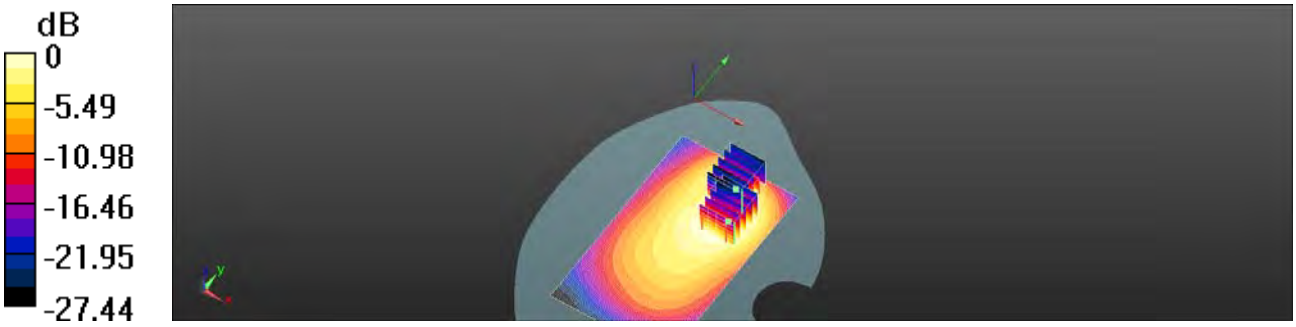
DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom:Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.869 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.527 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.694 W/kg; SAR(10 g) = 0.424 W/kg
Maximum value of SAR (measured) = 0.896 W/kg

Configuration/Body/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.527 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.545 W/kg; SAR(10 g) = 0.291 W/kg
Maximum value of SAR (measured) = 0.755 W/kg



0 dB = 0.869 W/kg = -0.61 dBW/kg

Date: 2014/6/25

CDMA BC1_Head_RE Cheek_CH 25

Communication System: CDMA ; Frequency: 1851.25 MHz

Medium parameters used: f = 1851.25 MHz; σ = 1.331 S/m; ε_r = 39.143; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.65, 7.65, 7.65); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

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

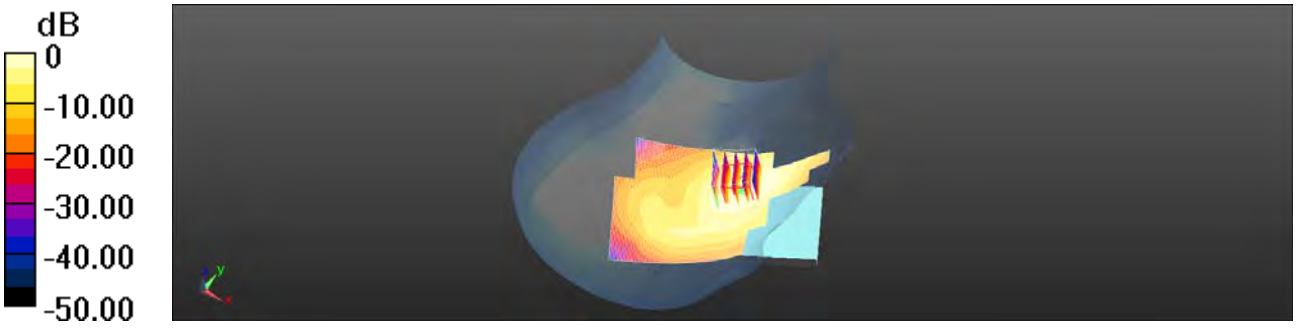
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.558 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.795 W/kg; SAR(10 g) = 0.491 W/kg

Maximum value of SAR (measured) = 1.01 W/kg



0 dB = 1.06 W/kg = 0.24 dBW/kg

Date: 2014/6/26

CDMA BC1_Body-worn_Front side_CH 600

Communication System: CDMA; Frequency: 1880 MHz

Medium parameters used: f = 1880 MHz; σ = 1.511 S/m; ε_r = 54.156; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.29, 7.29, 7.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.738 W/kg

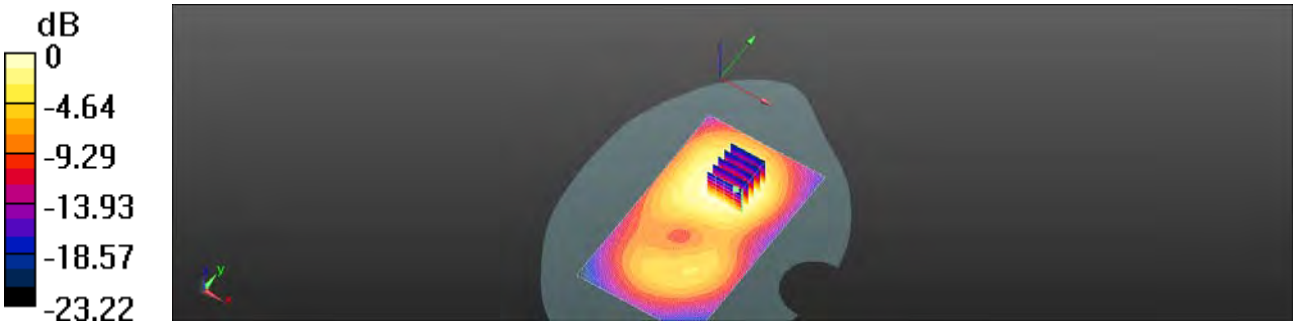
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.086 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.878 W/kg

SAR(1 g) = 0.555 W/kg; SAR(10 g) = 0.345 W/kg

Maximum value of SAR (measured) = 0.723 W/kg



0 dB = 0.738 W/kg = -1.32 dBW/kg

Date: 2014/6/25

EVDO BC1_Head_RE Cheek_CH 25_Rev A

Communication System: 1xEVDO ; Frequency: 1851.25 MHz

Medium parameters used: f = 1851.25 MHz; σ = 1.334 S/m; ε_r = 39.128; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.65, 7.65, 7.65); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

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

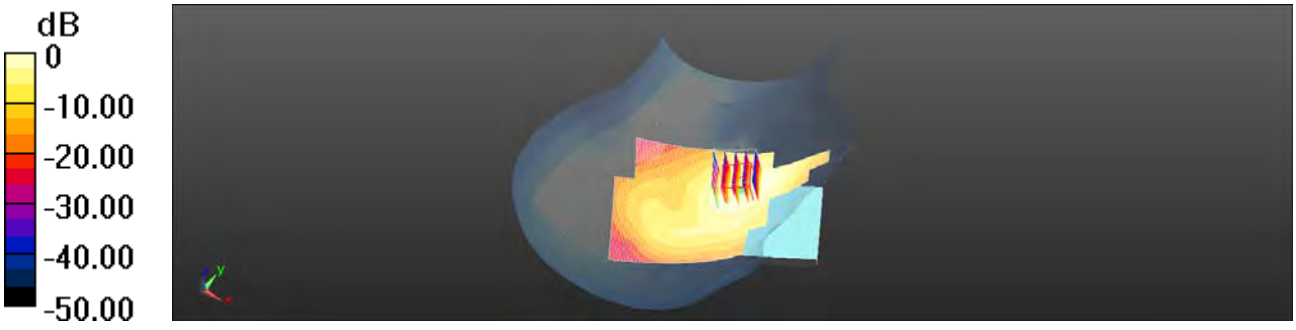
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.950 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.793 W/kg; SAR(10 g) = 0.487 W/kg

Maximum value of SAR (measured) = 1.00 W/kg



0 dB = 1.06 W/kg = 0.24 dBW/kg

Date: 2014/6/26

EVDO BC1_Hotspot mode_Back side_CH 25_Rev 0

Communication System: 1xEVDO; Frequency: 1851.25 MHz

Medium parameters used : f = 1851.25 MHz; σ = 1.482 S/m; ε_r = 54.224; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.29, 7.29, 7.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom:Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.897 W/kg

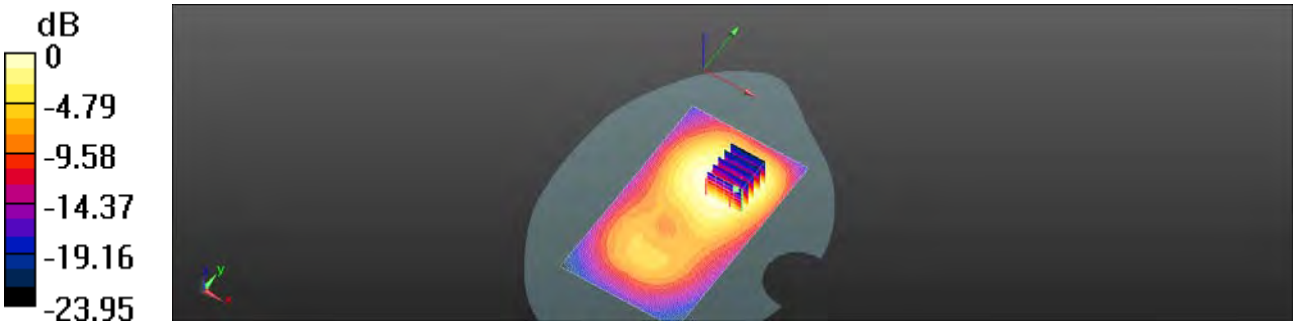
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.263 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.658 W/kg; SAR(10 g) = 0.411 W/kg

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



0 dB = 0.897 W/kg = -0.47 dBW/kg

Date: 2014/6/23

CDMA BC10_Head_RE Cheek_CH 476

Communication System: CDMA ; Frequency: 817.9 MHz

Medium parameters used: f = 818 MHz; σ = 0.894 S/m; ε_r = 41.768; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.19, 9.19, 9.19); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.417 W/kg

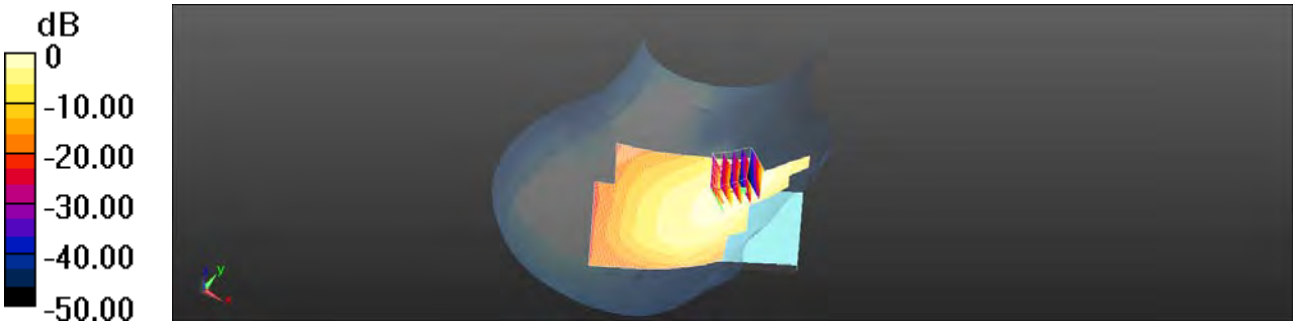
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.553 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.478 W/kg

SAR(1 g) = 0.333 W/kg; SAR(10 g) = 0.219 W/kg

Maximum value of SAR (measured) = 0.408 W/kg



0 dB = 0.417 W/kg = -3.80 dBW/kg

Date: 2014/6/24

CDMA BC10_Body-worn_Back side_CH 476

Communication System: CDMA; Frequency: 817.9 MHz

Medium parameters used: f = 818 MHz; σ = 0.97 S/m; ε_r = 53.133; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

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

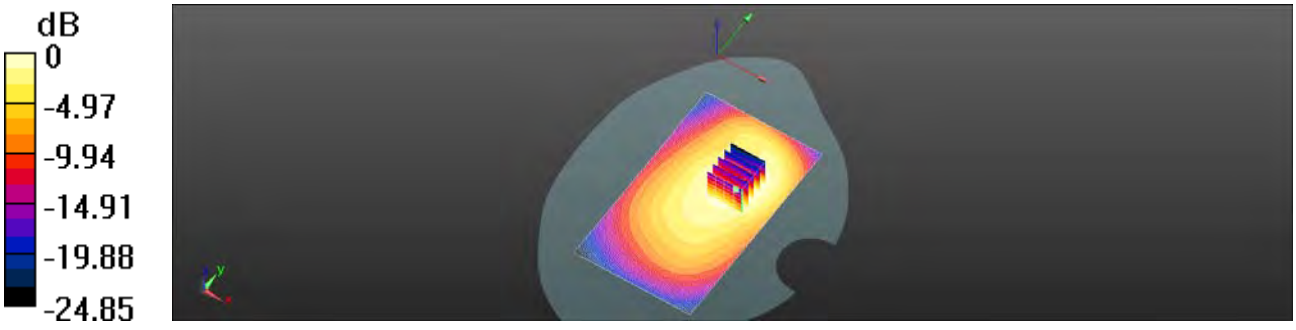
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.146 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.679 W/kg

SAR(1 g) = 0.455 W/kg; SAR(10 g) = 0.309 W/kg

Maximum value of SAR (measured) = 0.562 W/kg



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

Date: 2014/6/23

EVDO BC10_Head_RE Cheek_CH 560_Rev A

Communication System: 1xEVDO ; Frequency: 820 MHz

Medium parameters used: f = 820 MHz; σ = 0.897 S/m; ε_r = 41.866; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.19, 9.19, 9.19); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Head/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.345 W/kg

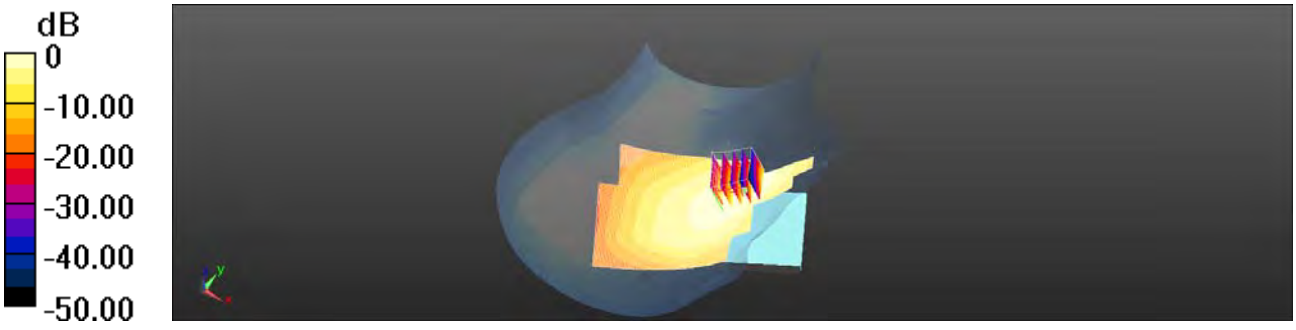
Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.735 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.402 W/kg

SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.186 W/kg

Maximum value of SAR (measured) = 0.346 W/kg



0 dB = 0.345 W/kg = -4.62 dBW/kg

Date: 2014/6/24

EVDO BC10_Hotspot mode_Back side_CH 476_Rev 0_repeat sar test at the highest sar measurement

Communication System: 1xEVDO; Frequency: 817.9 MHz

Medium parameters used: f = 818 MHz; σ = 0.97 S/m; ε_r = 53.133; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom:Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/Body/Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.895 W/kg

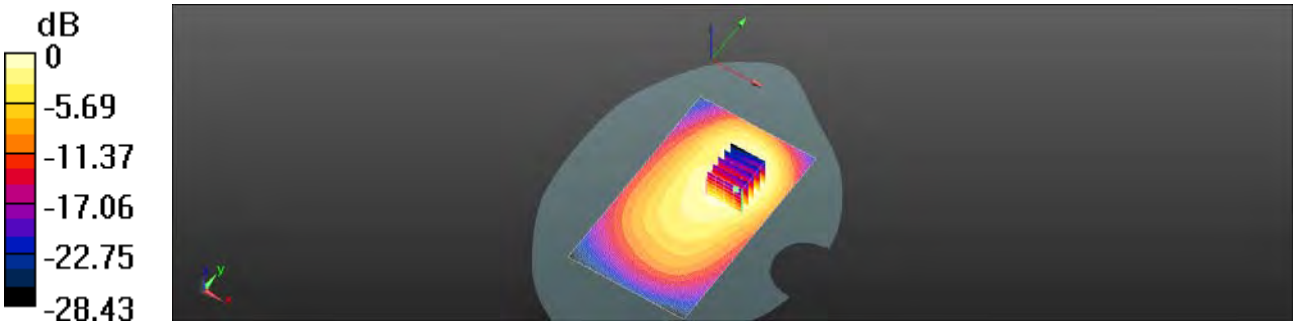
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.756 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.721 W/kg; SAR(10 g) = 0.462 W/kg

Maximum value of SAR (measured) = 0.928 W/kg



0 dB = 0.895 W/kg = -0.48 dBW/kg

Date: 2014/6/12

WLAN802.11b_Head_Le Tilt_CH 6

Communication System: WLAN 2.45G; Frequency: 2437 MHz

Medium parameters used: f = 2437 MHz; σ = 1.772 S/m; ε_r = 38.248; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.91, 6.91, 6.91); Calibrated: 2014/4/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head; ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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

Maximum value of SAR (interpolated) = 0.106 W/kg

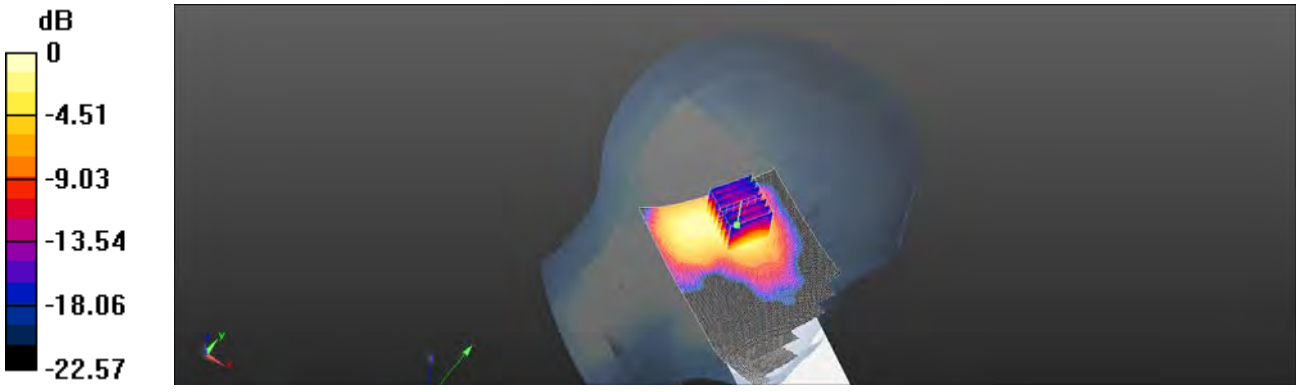
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.857 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.138 W/kg

SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.037 W/kg

Maximum value of SAR (measured) = 0.105 W/kg



0 dB = 0.105 W/kg = -9.79 dBW/kg

WLAN802.11b_Body-worn_Back side_CH 6

Communication System: WLAN 2.45G; Frequency: 2437 MHz

Medium parameters used: f = 2437 MHz; σ = 1.956 S/m; ε_r = 53.028; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.93, 6.93, 6.93); Calibrated: 2014/4/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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

Maximum value of SAR (interpolated) = 0.0512 W/kg

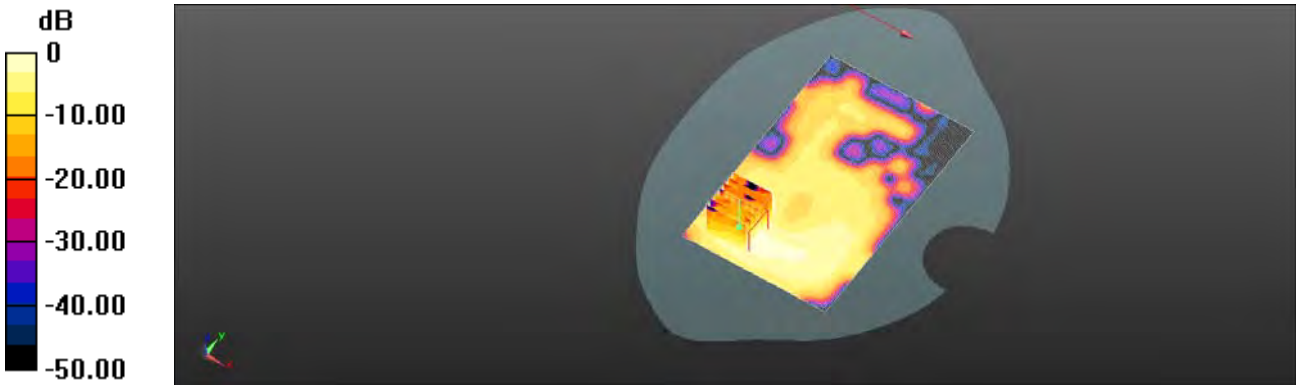
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.983 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.107 W/kg

SAR(1 g) = 0.035 W/kg; SAR(10 g) = 0.017 W/kg

Maximum value of SAR (measured) = 0.0520 W/kg



0 dB = 0.0520 W/kg = -12.84 dBW/kg

Date: 2014/6/12

WLAN802.11b_Hotspot mode_Back side_CH 6

Communication System: WLAN 2.45G; Frequency: 2437 MHz

Medium parameters used: f = 2437 MHz; σ = 1.956 S/m; ε_r = 53.028; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.93, 6.93, 6.93); Calibrated: 2014/4/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head; ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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

Maximum value of SAR (interpolated) = 0.175 W/kg

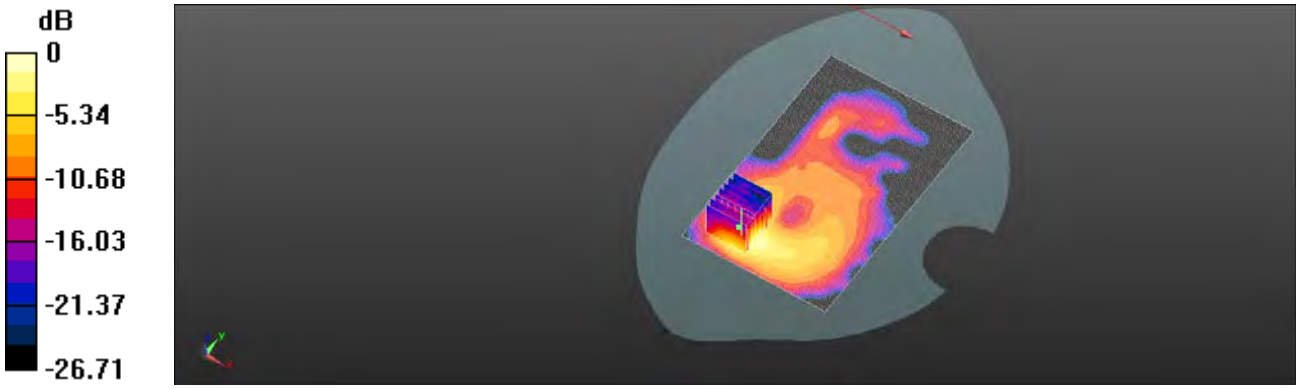
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.087 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.235 W/kg

SAR(1 g) = 0.108 W/kg; SAR(10 g) = 0.049 W/kg

Maximum value of SAR (measured) = 0.165 W/kg



0 dB = 0.165 W/kg = -7.83 dBW/kg

6. System Verification

Date: 2014/6/23

Dipole 835 MHz_SN:4d161_Head

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; σ = 0.903 S/m; ε_r = 41.756; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.19, 9.19, 9.19); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/d=15mm, Pin=250mW, dist=2mm: Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.77 W/kg

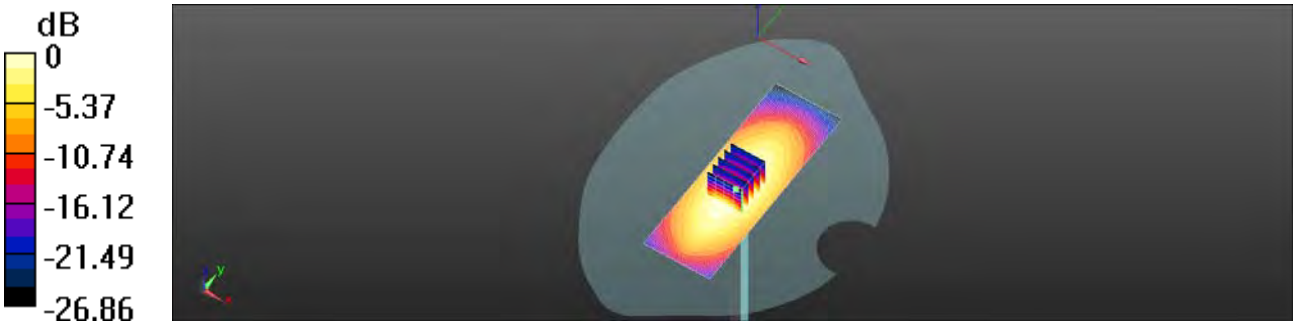
Configuration/d=15mm, Pin=250mW, dist=2mm/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 56.335 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.28 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.51 W/kg

Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.43 dBW/kg

Date: 2014/6/24

Dipole 835 MHz_SN:4d161_Body

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; σ = 0.988 S/m; ε_r = 52.936; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(9.29, 9.29, 9.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/d=15mm, Pin=250mW, dist=2mm: Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.88 W/kg

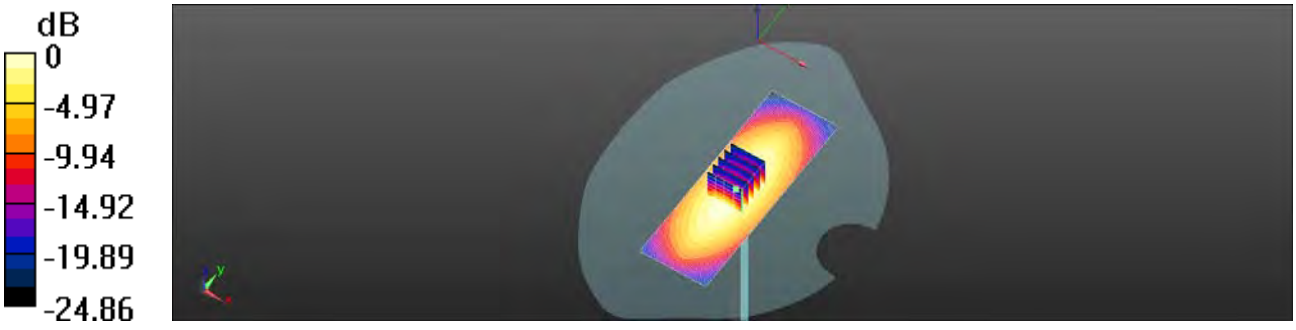
Configuration/d=15mm, Pin=250mW, dist=2mm/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 55.339 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.41 W/kg

SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (measured) = 2.88 W/kg



0 dB = 2.88 W/kg = 4.60 dBW/kg

Date: 2014/6/25

Dipole 1900 MHz_SN:5d027_Head

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.378 S/m; ε_r = 38.94; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.65, 7.65, 7.65); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/d=10mm, Pin=250mW, dist=2mm: Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 13.1 W/kg

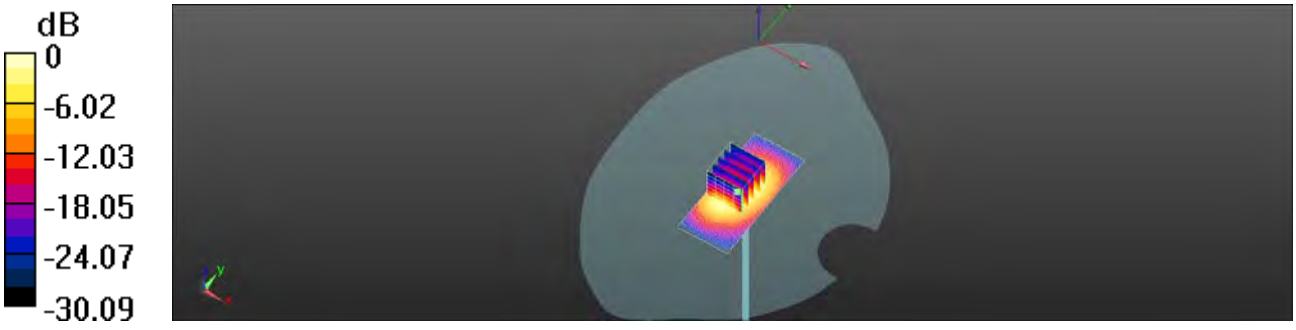
Configuration/d=10mm, Pin=250mW, dist=2mm/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 97.148 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 16.3 W/kg

SAR(1 g) = 9.64 W/kg; SAR(10 g) = 4.95 W/kg

Maximum value of SAR (measured) = 9.66 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

Date: 2014/6/26

Dipole 1900 MHz_SN:5d027_Body

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.533 S/m; ε_r = 54.081; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(7.29, 7.29, 7.29); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/d=10mm, Pin=250mW, dist=2mm/: Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 15.0 W/kg

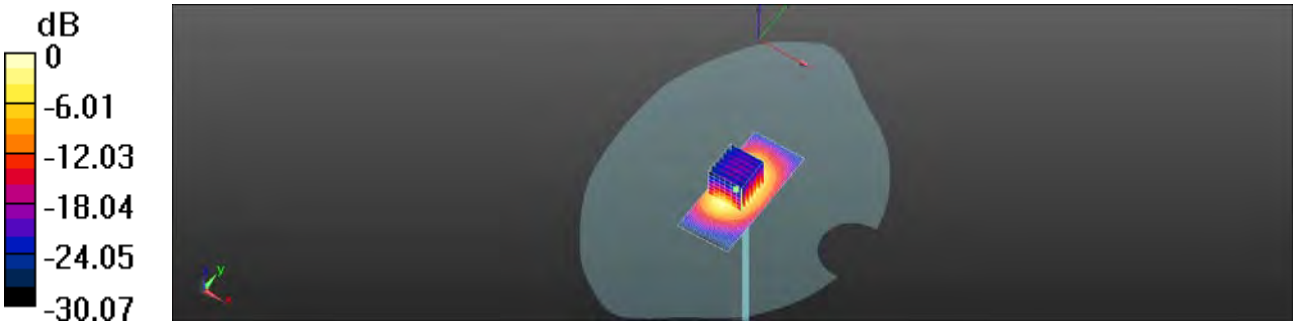
Configuration/d=10mm, Pin=250mW, dist=2mm/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.448 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 10 W/kg; SAR(10 g) = 5.25 W/kg

Maximum value of SAR (measured) = 14.3 W/kg



0 dB = 15.0 W/kg = 11.77 dBW/kg

Date: 2014/6/12

Dipole 2450 MHz_SN:922_Head

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; σ = 1.787 S/m; ε_r = 38.211; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.91, 6.91, 6.91); Calibrated: 2014/4/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=250mW, d=10mm/Area Scan (61x81x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 23.1 W/kg

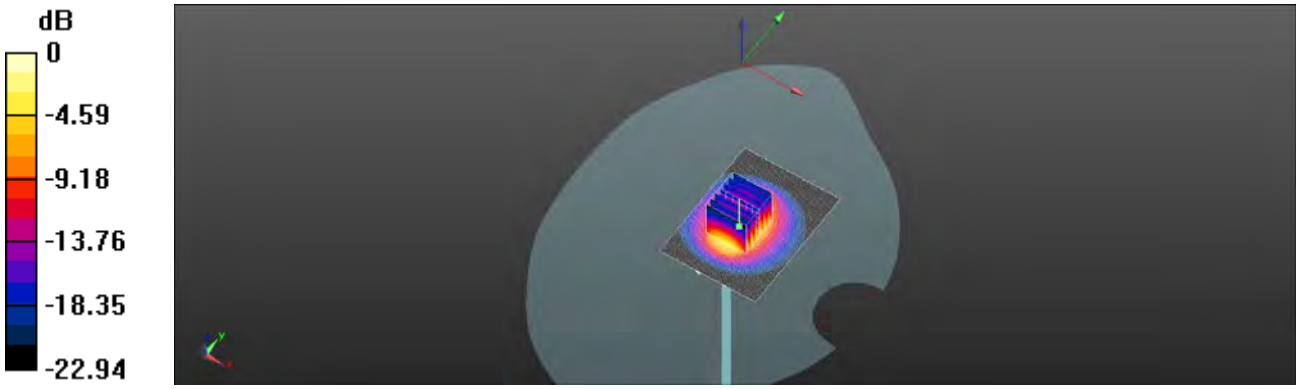
Dipole Calibration for Head Tissue/Pin=250mW, d=10mm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 112.8 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 30.2 W/kg

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.02 W/kg

Maximum value of SAR (measured) = 22.0 W/kg



0 dB = 22.0 W/kg = 13.42 dBW/kg

Dipole 2450 MHz_SN:922_Body

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; σ = 1.973 S/m; ε_r = 52.99; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.93, 6.93, 6.93); Calibrated: 2014/4/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250mW, d=10mm/Area Scan (61x81x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 22.2 W/kg

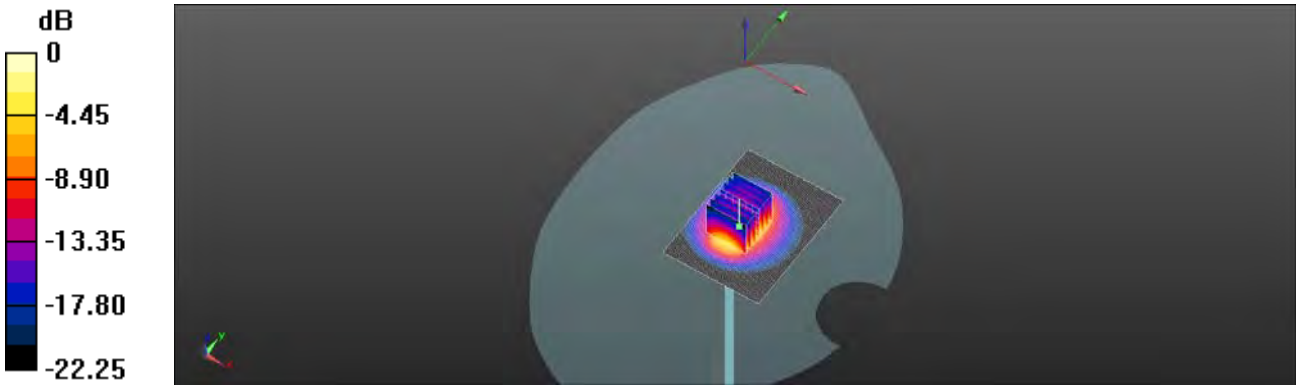
Dipole Calibration for Body Tissue/Pin=250mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.1 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 28.9 W/kg

SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.05 W/kg

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



0 dB = 21.1 W/kg = 13.24 dBW/kg

Date: 2014/6/27

Dipole 2600 MHz_SN:1005_Head

Communication System: CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz; σ = 2.03 S/m; ε_r = 38.266; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.71, 6.71, 6.71); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head ;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/d=10mm, Pin=250mW, dist=2mm: Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 22.7 W/kg

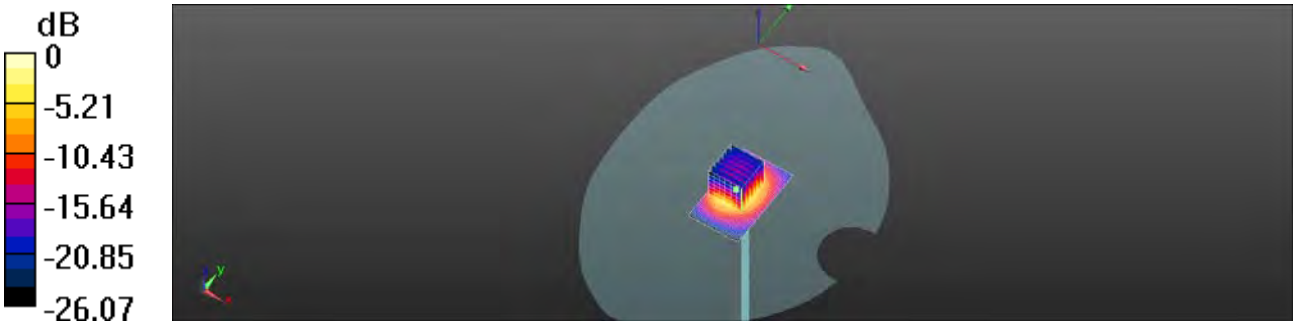
Configuration/d=10mm, Pin=250mW, dist=2mm /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.9 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 37.2 W/kg

SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.98 W/kg

Maximum value of SAR (measured) = 21.7 W/kg



0 dB = 22.7 W/kg = 13.55 dBW/kg

Dipole 2600 MHz_SN:1005_Body

Communication System: CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz; σ = 2.217 S/m; ε_r = 51.086; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3848; ConvF(6.7, 6.7, 6.7); Calibrated: 4/24/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2013/9/24
- Phantom: Head;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/d=10mm, Pin=250mW, dist=2mm: Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 32.6 W/kg

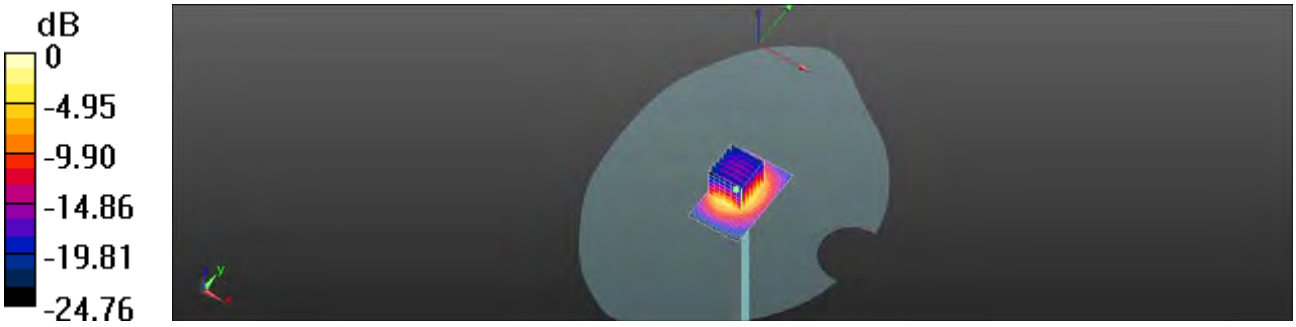
Configuration/d=10mm, Pin=250mW, dist=2mm /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 115.8 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 56.1 W/kg

SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.23 W/kg

Maximum value of SAR (measured) = 31.7 W/kg



0 dB = 32.6 W/kg = 15.13 dBW/kg

7. DAE & Probe Calibration Certificate

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: DAE4-1336_Sep13

CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BM - SN: 1336

Calibration procedure(s): QA CAL-06.v26
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: September 24, 2013

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	02-Oct-12 (No:12728)	Oct-13
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	07-Jan-13 (in house check)	In house check: Jan-14
Calibrator Box V2.1	SE UMS 006 AA 1002	07-Jan-13 (in house check)	In house check: Jan-14

	Name	Function	Signature
Calibrated by:	R.Mayoraz	Technician	
Approved by:	Fin Bomholt	Deputy Technical Manager	

Issued: September 24, 2013

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

Certificate No: DAE4-1336_Sep13 Page 1 of 5

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

S Schweizerischer Kalibrierdienst
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Accreditation No.: SCS 108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

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

Calibration Factors	X	Y	Z
High Range	403.237 ± 0.02% (k=2)	403.535 ± 0.02% (k=2)	403.020 ± 0.02% (k=2)
Low Range	3.94960 ± 1.50% (k=2)	3.98537 ± 1.50% (k=2)	3.98528 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	122.0 ° ± 1 °

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Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199994.85	-1.00	-0.00
Channel X	+ Input	20000.28	0.26	0.00
Channel X	- Input	-20000.96	0.29	-0.00
Channel Y	+ Input	199996.21	0.09	0.00
Channel Y	+ Input	19997.62	-2.55	-0.01
Channel Y	- Input	-20001.68	-0.35	0.00
Channel Z	+ Input	199997.48	1.52	0.00
Channel Z	+ Input	19999.63	-0.39	-0.00
Channel Z	- Input	-20002.39	-0.92	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.21	0.11	0.01
Channel X	+ Input	200.88	0.37	0.18
Channel X	- Input	-198.82	0.54	-0.27
Channel Y	+ Input	2000.00	-0.03	-0.00
Channel Y	+ Input	199.76	-0.69	-0.35
Channel Y	- Input	-200.27	-0.83	0.41
Channel Z	+ Input	2000.02	0.03	0.00
Channel Z	+ Input	199.72	-0.71	-0.36
Channel Z	- Input	-200.25	-0.80	0.40

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	6.37	4.62
	- 200	-3.40	-4.67
Channel Y	200	-3.98	-4.36
	- 200	2.07	2.00
Channel Z	200	22.00	21.75
	- 200	-23.78	-23.80

3. Channel separation

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

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	5.20	-1.05
Channel Y	200	8.91	-	7.14
Channel Z	200	9.03	6.60	-

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4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	15652	15053
Channel Y	15907	15561
Channel Z	15891	15503

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.97	0.18	1.87	0.34
Channel Y	0.06	-1.23	0.94	0.40
Channel Z	1.25	0.46	2.02	0.34

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

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

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

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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Calibration Laboratory of
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Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: EX3-3848_Apr14

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3848

Calibration procedure(s) QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: April 24, 2014

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°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	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01918)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 24, 2014

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

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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, D	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
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization 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; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical Isotropy (3D deviation from Isotropy):* In a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Probe EX3DV4

SN:3848

Manufactured: October 25, 2011
Calibrated: April 24, 2014

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

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3848

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.41	0.41	0.45	± 10.1 %
DCP (mV)[B]	98.6	97.4	97.6	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	141.5	±3.0 %
		Y	0.0	0.0	1.0		143.4	
		Z	0.0	0.0	1.0		127.9	

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:3848

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 [G]	Depth [G] (mm)	Unct. (k=2)
750	41.9	0.89	9.57	9.57	9.57	0.65	0.67	± 12.0 %
835	41.5	0.90	9.19	9.19	9.19	0.46	0.79	± 12.0 %
900	41.5	0.97	8.98	8.98	8.98	0.25	1.08	± 12.0 %
1450	40.5	1.20	8.10	8.10	8.10	0.62	0.73	± 12.0 %
1750	40.1	1.37	7.91	7.91	7.91	0.80	0.58	± 12.0 %
1900	40.0	1.40	7.65	7.65	7.65	0.59	0.67	± 12.0 %
2000	40.0	1.40	7.68	7.68	7.68	0.43	0.79	± 12.0 %
2450	39.2	1.80	6.91	6.91	6.91	0.43	0.76	± 12.0 %
2600	39.0	1.96	6.71	6.71	6.71	0.34	0.94	± 12.0 %
5200	36.0	4.66	5.35	5.35	5.35	0.35	1.80	± 13.1 %
5300	35.9	4.76	5.14	5.14	5.14	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.53	4.53	4.53	0.35	1.80	± 13.1 %
5800	35.3	5.27	4.78	4.78	4.78	0.40	1.80	± 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.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3848

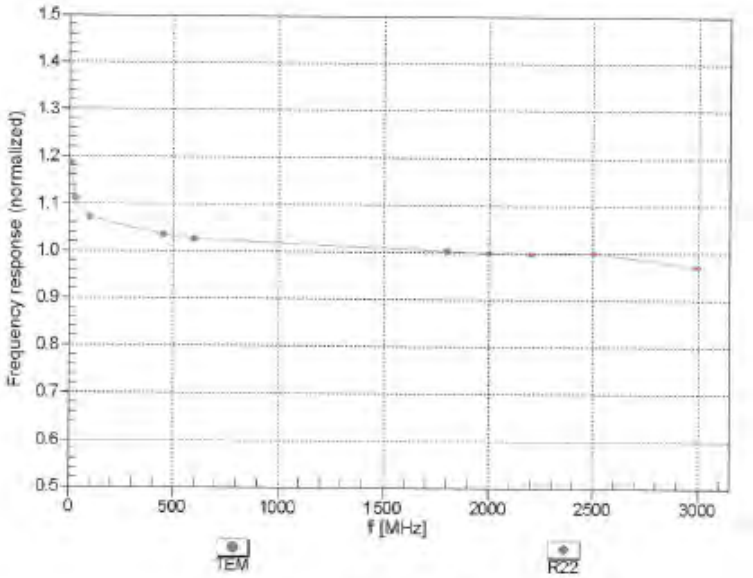
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
750	55.5	0.96	9.45	9.45	9.45	0.46	0.83	± 12.0 %
835	55.2	0.97	9.29	9.29	9.29	0.47	0.79	± 12.0 %
900	55.0	1.05	9.13	9.13	9.13	0.43	0.83	± 12.0 %
1450	54.0	1.30	7.82	7.82	7.82	0.43	0.81	± 12.0 %
1750	53.4	1.49	7.58	7.58	7.58	0.53	0.76	± 12.0 %
1900	53.3	1.52	7.29	7.29	7.29	0.34	0.98	± 12.0 %
2000	53.3	1.52	7.46	7.46	7.46	0.52	0.76	± 12.0 %
2450	52.7	1.95	6.93	6.93	6.93	0.80	0.56	± 12.0 %
2600	52.5	2.16	6.70	6.70	6.70	0.76	0.58	± 12.0 %
5200	49.0	5.30	4.83	4.83	4.83	0.40	1.90	± 13.1 %
5300	48.9	5.42	4.66	4.66	4.66	0.40	1.90	± 13.1 %
5600	48.5	5.77	3.98	3.98	3.98	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.22	4.22	4.22	0.50	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.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4– SN:3848 April 24, 2014

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



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

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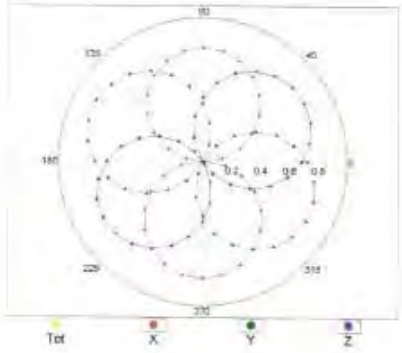
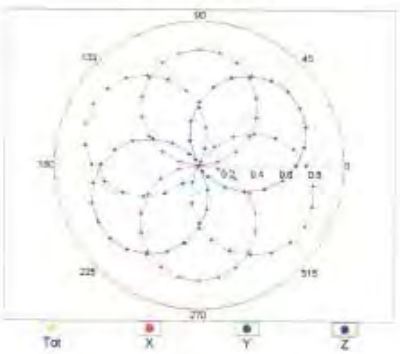
EX3DV4- SN:3848 April 24, 2014

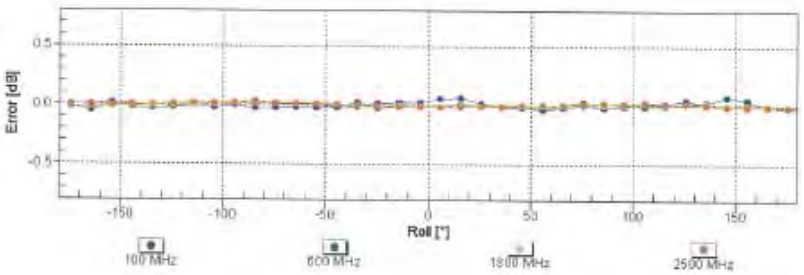
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22





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

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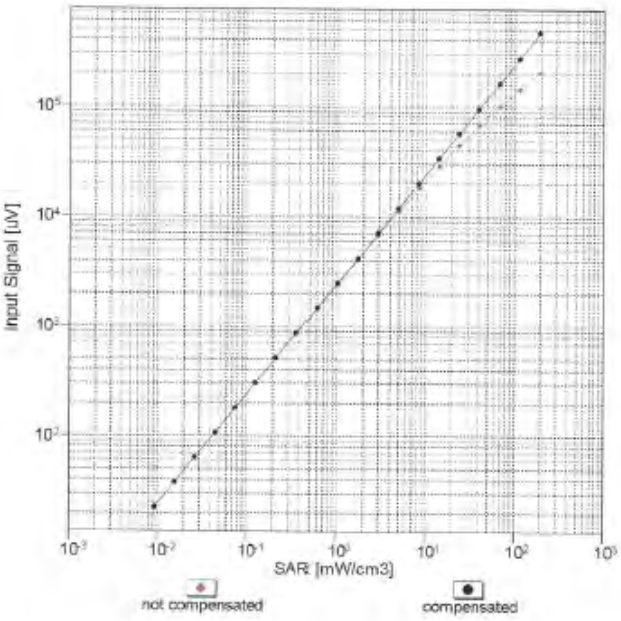
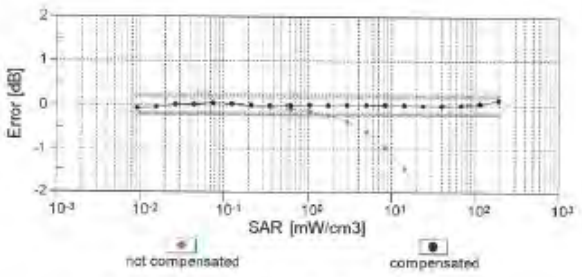
Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)



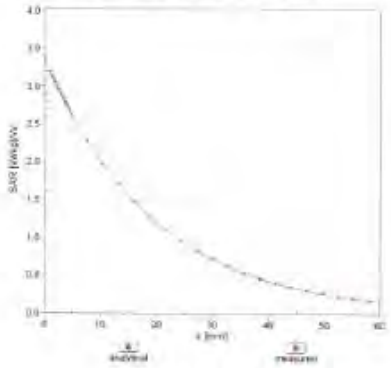


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

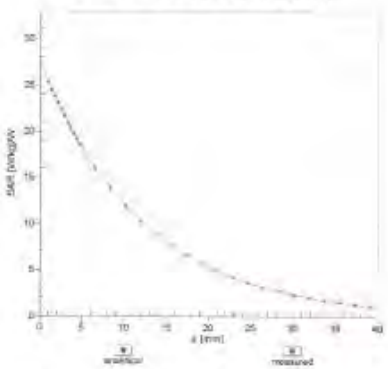
EX3DV4– SN:3848 April 24, 2014

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

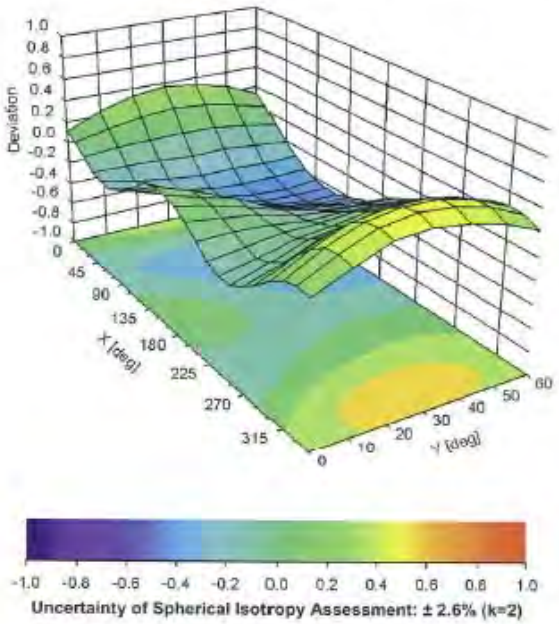


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3848

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-54.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

8. 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(under 6Ghz)	6.55%	N	1	1	1	6.55%	6.55%	∞
Isotropy , Axial	3.50%	R	√3	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1	1	5.54%	5.54%	∞
Boundary Effect	1.00%	R	√3	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1	1	1.73%	1.73%	∞
RF ambient conditions -reflections	3.00%	R	√3	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1	1	0.58%	0.58%	∞
Test Sample related								
Test sample	2.90%	N	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1	1	2.89%	2.89%	∞
Phantom and Setup								
Phantom Uncertainty	4.00%	R	√3	1	1	2.31%	2.31%	∞
Liquid conductivity(meas.)	4.93%	N	1	0.64	0.43	3.16%	2.12%	M
Liquid permitivity(meas.)	4.35%	N	1	0.6	0.49	2.61%	2.13%	M
Combined standard uncertainty		RSS				12.27%	11.95%	
Expant uncertainty (95% confidence interval), K=2						24.55%	23.91%	

9. Phantom Description

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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

s p e a g
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info@speag.com, http://www.speag.com

10. System Validation from Original Equipment Supplier

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

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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: D835V2-4d161_Nov13

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d161

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: November 01, 2013

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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	26-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-15
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 1, 2013

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Certificate No: D835V2-4d161_Nov13 Page 1 of 8

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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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	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	40.8 ± 6 %	0.94 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	2.46 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.49 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.18 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	1.01 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	2.40 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.32 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.13 W/kg ± 16.5 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.9 Ω - 2.4 jΩ
Return Loss	- 27.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7 Ω - 5.1 jΩ
Return Loss	- 24.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.425 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 28, 2012

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DASY5 Validation Report for Head TSL

Date: 01.11.2013

Test Laboratory: SPEAG, Zurich, Switzerland

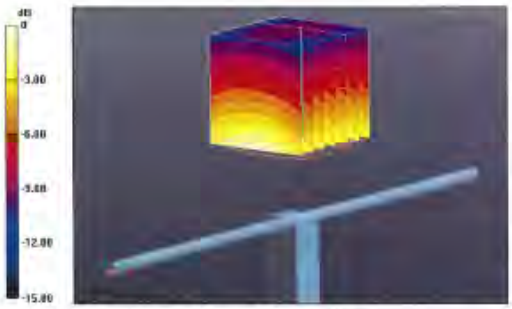
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d161

Communication System: UID 0 - CW ; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.05, 6.05, 6.05); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.867 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 2.88 W/kg



0 dB = 2.88 W/kg = 4.59 dBW/kg

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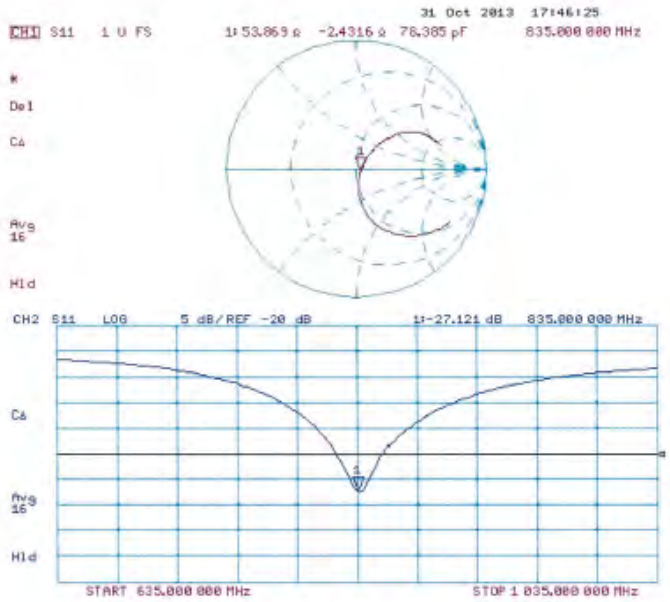
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 01.11.2013

Test Laboratory: SPEAG, Zurich, Switzerland

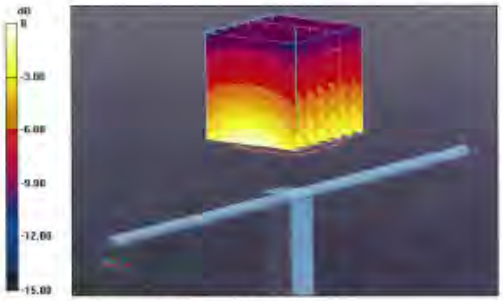
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d161

Communication System: UID 0 - CW ; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.007 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.021 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 2.81 W/kg



0 dB = 2.81 W/kg = 4.49 dBW/kg

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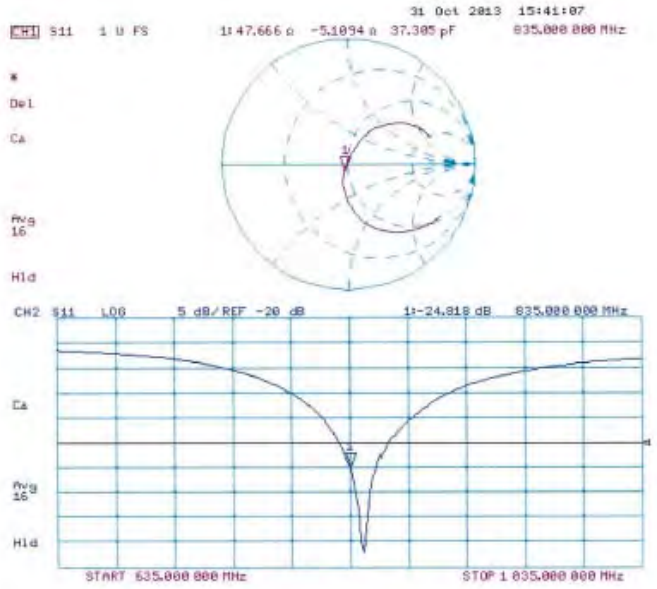
Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client: SGS-TW (Auden)

Certificate No: D1900V2-5d027_Apr14

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d027

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: April 23, 2014

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 23, 2014

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Certificate No: D1900V2-5d027_Apr14 Page 1 of 8

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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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.36 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	9.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.6 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.4 ± 6 %	1.52 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	9.87 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.22 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.8 W/kg ± 16.5 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 Ω + 6.8 jΩ
Return Loss	- 23.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3 Ω + 2.8 jΩ
Return Loss	- 26.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

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DASY5 Validation Report for Head TSL

Date: 23.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

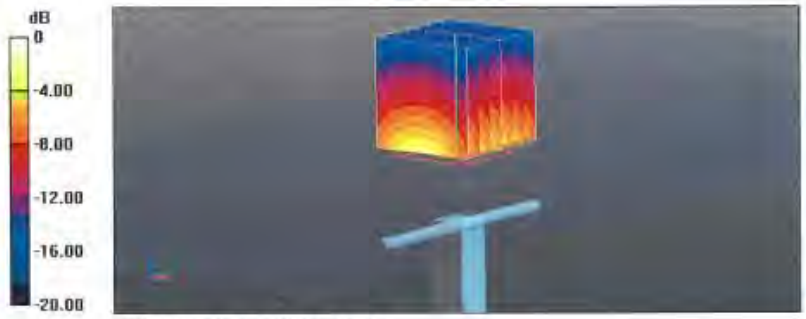
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027

Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.36 S/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

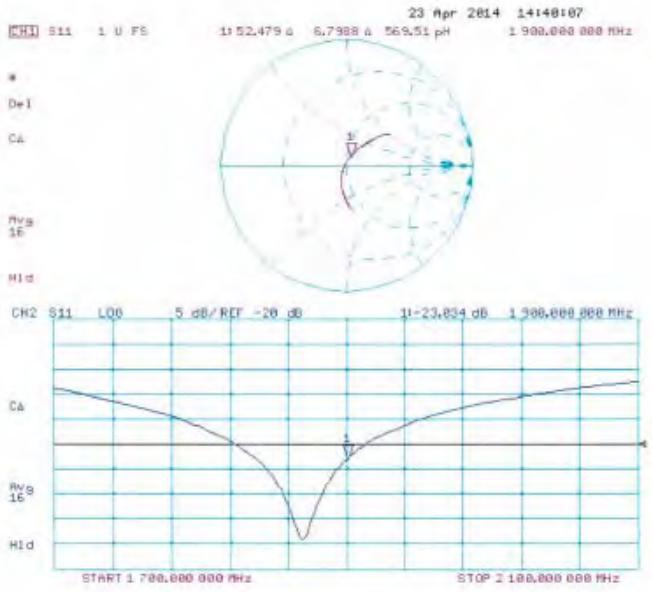
- Probe: ES3DV3 - SN3205; ConvF(5.06, 5.06, 5.06); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.825 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.71 W/kg; SAR(10 g) = 5.1 W/kg
Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.90 dBW/kg

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 22.04.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.52 S/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.526 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.87 W/kg; SAR(10 g) = 5.22 W/kg
Maximum value of SAR (measured) = 12.5 W/kg

0 dB = 12.5 W/kg = 10.97 dBW/kg

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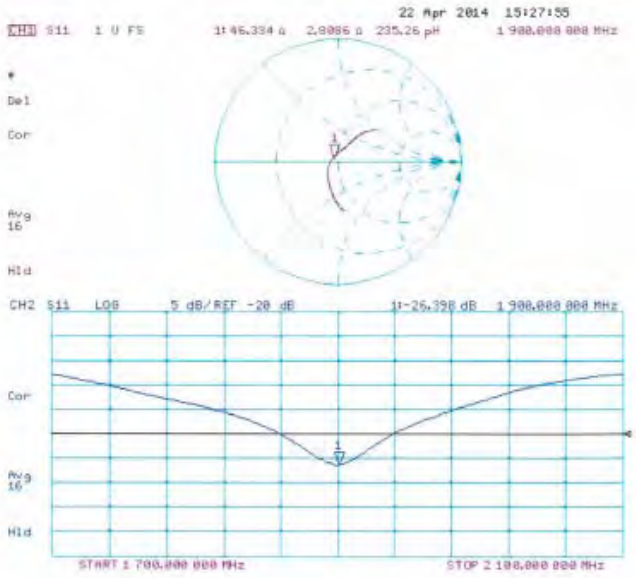
Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: D2450V2-922_Nov13

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 922
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	November 05, 2013

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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-15
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Israa El-Naggar	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 5, 2013

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Certificate No: D2450V2-922_Nov13 Page 1 of 8

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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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.7 ± 6 %	1.84 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	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.13 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.4 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.1 ± 6 %	2.02 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	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**50.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.96 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.6 W/kg ± 16.5 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.5 Ω + 3.5 jΩ
Return Loss	- 26.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.0 Ω + 5.0 jΩ
Return Loss	- 25.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.161 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 26, 2013

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DASY5 Validation Report for Head TSL

Date: 05.11.2013

Test Laboratory: SPEAG, Zurich, Switzerland

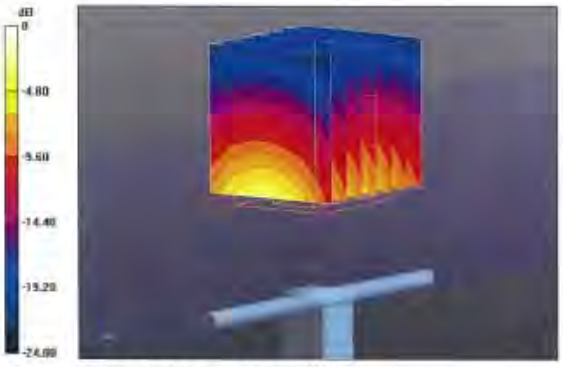
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 922

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.84 S/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.52, 4.52, 4.52); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.82 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.13 W/kg
Maximum value of SAR (measured) = 16.8 W/kg



0 dB = 16.8 W/kg = 12.25 dBW/kg

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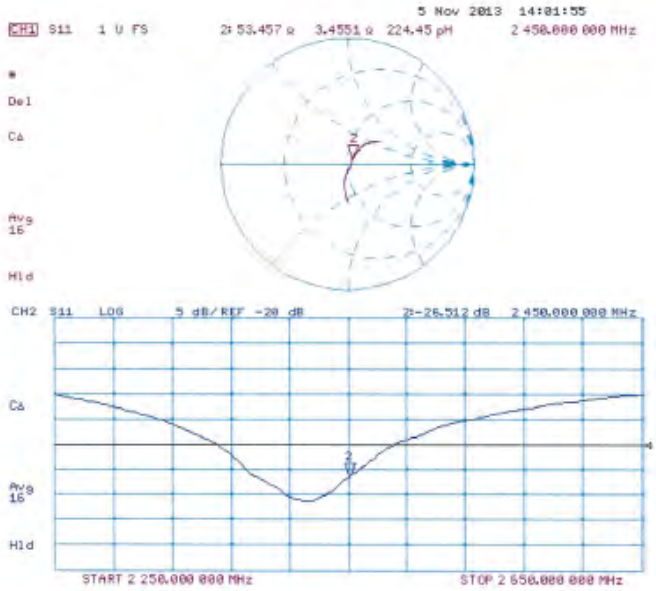
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 01.11.2013

Test Laboratory: SPEAG, Zurich, Switzerland

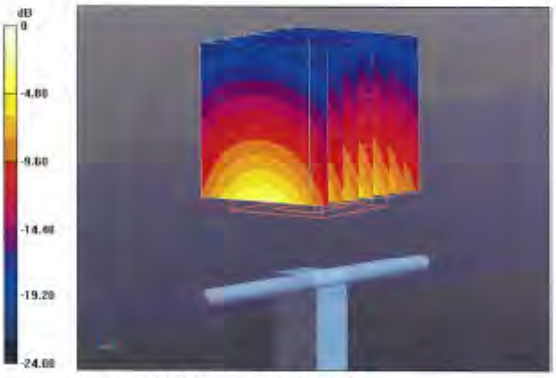
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 922

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.02 S/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.42, 4.42, 4.42); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.218 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 27.0 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.96 W/kg
Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kg = 12.28 dBW/kg

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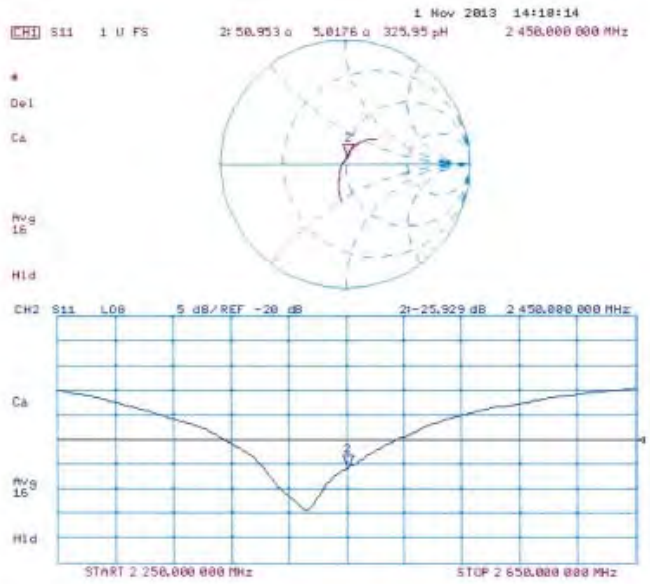
Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client: SGS-TW (Auden)

Certificate No: D2600V2-1005_Jan14

CALIBRATION CERTIFICATE

Object	D2600V2 - SN: 1005
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	January 28, 2014

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

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

Issued: January 29, 2014

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Certificate No: D2600V2-1005_Jan14 Page 1 of 8

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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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.2 ± 6 %	2.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**57.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**26.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.9 ± 6 %	2.21 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	14.3 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**56.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.33 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**25.1 W/kg ± 16.5 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 3.2 jΩ
Return Loss	- 30.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.5 Ω - 2.6 jΩ
Return Loss	- 26.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.155 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 23, 2006

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Member of SGS Group

DASY5 Validation Report for Head TSL

Date: 28.01.2014

Test Laboratory: SPEAG, Zurich, Switzerland

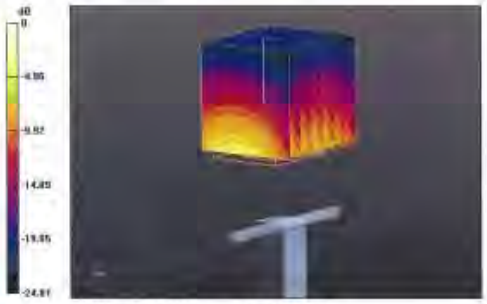
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1005

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.02 S/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.46, 4.46, 4.46); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.590 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 31.3 W/kg
SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.57 W/kg
Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 19.3 W/kg = 12.86 dBW/kg

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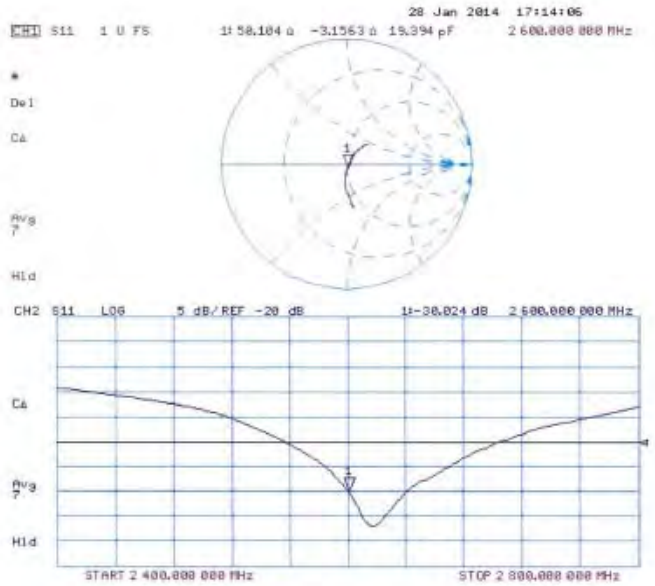
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 28.01.2014

Test Laboratory: SPEAG, Zurich, Switzerland

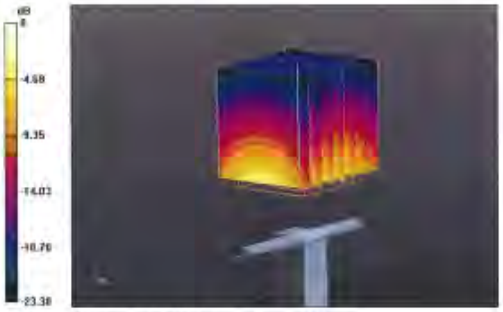
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1005

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.21 S/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.24, 4.24, 4.24); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.624 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.33 W/kg
Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 19.3 W/kg = 12.86 dBW/kg

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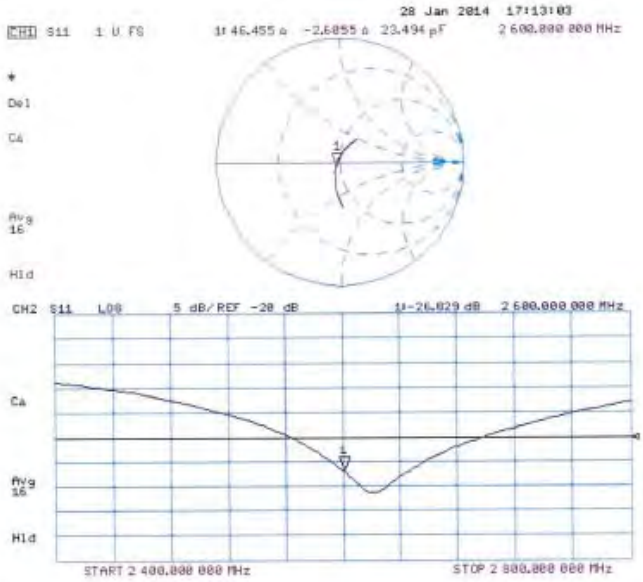
Impedance Measurement Plot for Body TSL



End of 1st part of report

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