SAR TEST REPORT

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

Equipment Under Test	Mobile Computers
Model No.	H-28 NCSA
Brand Name	Opticon
Company Name	Opticon Sensors Europe B.V
Company Address	Opaallaan 35, 2132 XV Hoofddorp, The Netherlands
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013, KDB248227D01v02r02,KDB865664D01v01r04, KDB865664D02v01r02,KDB941225D01v03r01, KDB941225D06v02r01,KDB447498D01v06, KDB648474D04v01r03, KDB941225D05v02r05
FCC ID	XMR201805EC25AU (WWAN) / SPYIM002 (WLAN)
Date of Receipt	Sep. 28, 2018
Date of Test(s)	Nov. 06, 2018 ~ Nov. 23, 2018
Date of Issue	Dec. 17, 2018

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

Remarks:

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

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

Clerk / Ruby Ou	Engineer / Bond Tsai	Asst. Manager / John Yeh
Ruby Ou	Bond Tsai	John Yeh

Date: Dec. 17, 2018

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Revision History

Report Number	Revision	Description	Issue Date
E5/2018/90017	Rev.00	Initial creation of document	Nov. 29, 2018
E5/2018/90017	Rev.01	Modify chapter1.3/2/5/6	Dec. 17, 2018

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1. General Information

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1.2 Details of Applicant

Company Name	Opticon Sensors Europe B.V
Company Address	Opaallaan 35, 2132 XV Hoofddorp, The Netherlands

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1.3 Description of EUT

EUT Name	Mobile Computers	
Model No.	H-28 NCSA	
Brand Name	Opticon	
WWAN FCC ID	XMR201805EC25AU	
WLAN FCC ID	SPYIM002	
Host FCC ID	Q2QH28NCSA	
Mode of Operation	☒GSM ☒GPRS ☒WCDMA ☒HSDPA ☒HSUPA ☒LTE FDD ☒WLAN802.11 a/b/g/n/ac(20M/40M/80M) ☒Bluetooth	
Duty Cycle	GSM (DTM multi class B)	1/8.3
	GPRS (support multi class 12 max)	1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP) 1/8.3 (1Dn1UP)
	LTE FDD	1
	WCDMA	1
	WLAN802.11 a/b/g/n/ac(20M/40M/80M)	1
	Bluetooth	1
TX Frequency Range (MHz)	GSM850	824 – 849
	GSM1900	1850 – 1910
	WCDMA Band II	1850 – 1910
	WCDMA Band V	824 – 849
	LTE FDD Band 2	1850 – 1910
	LTE FDD Band 4	1710 – 1755
	LTE FDD Band 5	824 – 849
	LTE FDD Band 7	2500 – 2570
	WiFi 2.4GHz	2412 – 2462
	WiFi 5GHz	5150 – 5825
	Bluetooth	2402 – 2480

Channel Number (ARFCN)	GSM850	128	–	251
	GSM1900	512	–	810
	WCDMA Band II	9262	–	9538
	WCDMA Band V	4132	–	4233
	LTE FDD Band 2	18607	–	19193
	LTE FDD Band 4	19957	–	20393
	LTE FDD Band 5	20407	–	20643
	LTE FDD Band 7	20775	–	21425
	WiFi 2.4GHz	1	–	11
	WiFi 5GHz	36	–	165
	Bluetooth	0	–	78

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Max. SAR (1-g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Head	GSM 850	0.33	0.43	☒Left ☐Right ☒Cheek ☐Tilt 128 Channel
	GSM 1900	0.23	0.31	☐Left ☒Right ☒Cheek ☐Tilt 512 Channel
	WCDMA Band II	0.48	0.70	☐Left ☒Right ☒Cheek ☐Tilt 9262 Channel
	WCDMA Band V	0.20	0.28	☒Left ☐Right ☒Cheek ☐Tilt 4132 Channel
	LTE FDD Band 2	0.57	0.82	☐Left ☒Right ☒Cheek ☐Tilt 19100 Channel
	LTE FDD Band 4	0.35	0.44	☐Left ☒Right ☒Cheek ☐Tilt 20300 Channel
	LTE FDD Band 5	0.24	0.31	☒Left ☐Right ☒Cheek ☐Tilt 20450 Channel
	LTE FDD Band 7	0.86	1.25	☐Left ☒Right ☒Cheek ☐Tilt 20850 Channel

Max. SAR (1-g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Body-worn	GSM 850	0.65	0.84	☐Front ☒Back 128 Channel
	GSM 1900	0.24	0.33	☐Front ☒Back 512 Channel
	WCDMA Band II	0.35	0.51	☐Front ☒Back 9262 Channel
	WCDMA Band V	0.39	0.53	☐Front ☒Back 4132 Channel
	LTE FDD Band 2	0.30	0.42	☐Front ☒Back 19100 Channel
	LTE FDD Band 4	0.44	0.54	☐Front ☒Back 20300 Channel
	LTE FDD Band 5	0.42	0.55	☐Front ☒Back 20450 Channel
	LTE FDD Band 7	0.40	0.58	☒Front ☐Back 20850 Channel

Max. SAR (1-g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Hotspot mode	GPRS 850 (1Dn2UP)	1.30	1.42	☐Front ☒Back ☐Left ☐Right ☐Bottom 251 Channel
	GPRS 1900 (1Dn4UP)	0.60	0.69	☐Front ☒Back ☐Left ☐Right ☐Bottom 810 Channel
	WCDMA Band II	0.35	0.51	☐Front ☒Back ☐Left ☐Right ☐Bottom 9262 Channel
	WCDMA Band V	0.39	0.53	☐Front ☒Back ☐Left ☐Right ☐Bottom 4132 Channel
	LTE FDD Band 2	0.30	0.42	☐Front ☒Back ☐Left ☐Right ☐Bottom 19100 Channel
	LTE FDD Band 4	0.44	0.54	☐Front ☒Back ☐Left ☐Right ☐Bottom 20300 Channel
	LTE FDD Band 5	0.42	0.55	☐Front ☒Back ☐Left ☐Right ☐Bottom 20450 Channel
	LTE FDD Band 7	0.44	0.64	☐Front ☐Back ☐Left ☒Right ☐Bottom 20850 Channel

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Mode	Band	Measured	Reported	Position / Channel
Head	WLAN802.11 b	0.15	0.16	☒Left ☐Right ☒Cheek ☐Tilt 11 Channel
	WLAN802.11a5.2G	0.09	0.10	☒Left ☐Right ☐Cheek ☒Tilt 48 Channel
	WLAN802.11a5.3G	0.12	0.12	☒Left ☐Right ☐Cheek ☒Tilt 64 Channel
	WLAN802.11a5.6G	0.11	0.12	☒Left ☐Right ☐Cheek ☒Tilt 100 Channel
	WLAN802.11a5.8G	0.05	0.05	☒Left ☐Right ☐Cheek ☒Tilt 149 Channel
	Bluetooth	0.02	0.02	☒Left ☐Right ☒Cheek ☐Tilt 39 Channel

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Mode	Band	Measured	Reported	Position / Channel
Body-worn	WLAN802.11 b	0.11	0.12	☐Front ☒Back 11 Channel
	WLAN802.11a5.2G	0.17	0.20	☐Front ☒Back 48 Channel
	WLAN802.11a5.3G	0.21	0.24	☐Front ☒Back 64 Channel
	WLAN802.11a5.6G	0.19	0.22	☐Front ☒Back 100 Channel
	WLAN802.11a5.8G	0.16	0.19	☐Front ☒Back 149 Channel
	Bluetooth	0.02	0.02	☐Front ☒Back 39 Channel

Mode	Band	Measured	Reported	Position / Channel
Hotspot mode	WLAN802.11 b	0.13	0.14	☐Front ☐Back ☐Top ☐Left ☒Right ____11___Channel

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Mode	Band	Measured	Reported	Position / Channel
Product specific 10g-SAR	GPRS 850 (1Dn2UP)	1.88	2.06	☐Front ☒Back ☐Top ☐Right ☐Left 251 Channel
	WLAN802.11a5.2G	0.33	0.39	☐Front ☒Back ☐Top ☐Right ☐Left 48 Channel
	WLAN802.11a5.3G	0.41	0.47	☐Front ☒Back ☐Top ☐Right ☐Left 64 Channel
	WLAN802.11a5.6G	0.38	0.45	☐Front ☒Back ☐Top ☐Right ☐Left 100 Channel
	WLAN802.11a5.8G	0.30	0.36	☐Front ☒Back ☐Top ☐Right ☐Left 149 Channel

GSM 850 - conducted power table:

EUT mode	Frequency (MHz)	CH	Max. Rated Avg. Power + Max.Tolerance (dBm)	Burst average power	Source-based time average power
				Avg. (dBm)	Avg. (dBm)
GSM 850 (GMSK)	824.2	128	35	33.90	24.87
	836.6	190	35	33.88	24.85
	848.8	251	35	33.80	24.77
The division factor compared to the number of TX time slot					
Division factor				1 TX time slot	
				-9.03	

GPRS 850 - conducted power table:

Burst average power						
Max. Rated Avg. Power + Max. Tolerance (dBm)			35	34	31	30
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	CH	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 850	824.2	128	33.90	33.77	30.74	29.35
	836.6	190	33.88	33.74	30.61	29.11
	848.8	251	33.80	33.61	30.46	29.06
Source-based time average power						
GPRS 850	824.2	128	24.87	27.75	26.48	26.34
	836.6	190	24.85	27.72	26.35	26.10
	848.8	251	24.77	27.59	26.20	26.05
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

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EDGE 850 - conducted power table:

Burst average power						
Max. Rated Avg. Power + Max. Tolerance (dBm)			27	27	27	27
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	CH	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 850	824.2	128	26.91	26.76	26.68	26.53
	836.6	190	26.98	26.81	26.72	26.50
	848.8	251	26.85	26.77	26.57	26.47
Source-based time average power						
GPRS 850	824.2	128	17.88	20.74	22.42	23.52
	836.6	190	17.95	20.79	22.46	23.49
	848.8	251	17.82	20.75	22.31	23.46
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

GSM 1900 - conducted power table:

EUT mode	Frequency (MHz)	CH	Max. Rated Avg. Power + Max.Tolerance (dBm)	Burst average power	Source-based time average power
				Avg. (dBm)	Avg. (dBm)
GSM1900 (GMSK)	1850.2	512	32	30.55	21.52
	1800	661	32	30.42	21.39
	1909.8	810	32	30.25	21.22
The division factor compared to the number of TX time slot					
Division factor				1 TX time slot	
				-9.03	

GPRS 1900 - conducted power table:

Burst average power						
Max. Rated Avg. Power + Max. Tolerance (dBm)			32	30.5	30.5	30.5
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	CH	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 1900	1850.2	512	30.55	30.41	30.27	30.12
	1880	661	30.42	30.32	30.20	30.05
	1909.8	810	30.25	30.15	30.03	29.88
Source-based time average power						
GPRS 1900	1850.2	512	21.52	24.39	26.01	27.11
	1880	661	21.39	24.30	25.94	27.04
	1909.8	810	21.22	24.13	25.77	26.87
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

EDGE 1900 - conducted power table:

Burst average power						
Max. Rated Avg. Power + Max. Tolerance (dBm)			27	27	27	26.5
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	CH	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 1900	1850.2	512	26.80	26.61	26.52	26.41
	1880	661	26.71	26.51	26.41	26.28
	1909.8	810	26.53	26.37	26.21	26.10
Source-based time average power						
GPRS 1900	1850.2	512	17.77	20.59	22.26	23.40
	1880	661	17.68	20.49	22.15	23.27
	1909.8	810	17.50	20.35	21.95	23.09
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

WCDMA Band II / Band V - HSDPA / HSUPA Conducted power table (Unit: dBm):

Band		WCDMA II		
TX Channel		9262	9400	9538
Frequency (MHz)		1850.2	1880	1907.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**25.00**		
3GPP Rel 99	RMC 12.2Kbps	23.37	22.89	23.07
3GPP Rel 5	HSDPA Subtest-1	22.37	22.55	22.50
	HSDPA Subtest-2	22.00	21.92	21.91
	HSDPA Subtest-3	21.80	21.88	21.86
	HSDPA Subtest-4	21.79	21.53	21.85
3GPP Rel 6	HSUPA Subtest-1	21.72	22.04	22.20
	HSUPA Subtest-2	21.14	20.91	20.94
	HSUPA Subtest-3	21.02	20.56	21.05
	HSUPA Subtest-4	21.19	21.76	21.33
	HSUPA Subtest-5	22.30	22.40	22.30

Band		WCDMA V		
TX Channel		4132	4183	4233
Frequency (MHz)		826.4	836.6	846.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**25.00**		
3GPP Rel 99	RMC 12.2Kbps	23.67	23.27	23.35
3GPP Rel 5	HSDPA Subtest-1	23.16	23.08	23.12
	HSDPA Subtest-2	22.83	22.62	22.65
	HSDPA Subtest-3	22.77	22.67	22.72
	HSDPA Subtest-4	22.78	22.53	22.74
3GPP Rel 6	HSUPA Subtest-1	22.79	22.68	23.06
	HSUPA Subtest-2	21.44	21.37	21.29
	HSUPA Subtest-3	22.34	22.42	22.28
	HSUPA Subtest-4	21.87	21.94	21.84
	HSUPA Subtest-5	23.30	23.40	23.20

Subtests for WCDMA Release 5 HSDPA

SUB-TEST	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15	15/15	64	12/15	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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Subtests for WCDMA Release 6 HSUPA

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

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LTE FDD Band 2 / Band 4 / Band 5 / Band 7 - conducted power table:

FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	1860	18700	23.01	25	0
				1880	18900	23.03	25	0
				1900	19100	23.05	25	0
			50	1860	18700	23.09	25	0
				1880	18900	23.28	25	0
				1900	19100	23.42	25	0
			99	1860	18700	23.08	25	0
				1880	18900	23.02	25	0
				1900	19100	23.07	25	0
		50 RB	0	1860	18700	22.34	24	0-1
				1880	18900	22.29	24	0-1
				1900	19100	22.42	24	0-1
			25	1860	18700	22.30	24	0-1
				1880	18900	22.27	24	0-1
				1900	19100	22.41	24	0-1
			50	1860	18700	22.20	24	0-1
				1880	18900	22.26	24	0-1
				1900	19100	22.21	24	0-1
		100RB		1860	18700	22.21	24	0-1
				1880	18900	22.25	24	0-1
				1900	19100	22.38	24	0-1
	16-QAM	1 RB	0	1860	18700	22.11	24	0-1
				1880	18900	22.41	24	0-1
				1900	19100	22.18	24	0-1
			50	1860	18700	22.22	24	0-1
				1880	18900	22.01	24	0-1
				1900	19100	22.21	24	0-1
			99	1860	18700	22.04	24	0-1
				1880	18900	22.06	24	0-1
				1900	19100	22.00	24	0-1
		50 RB	0	1860	18700	21.29	23	0-2
				1880	18900	21.39	23	0-2
				1900	19100	21.38	23	0-2
			25	1860	18700	21.36	23	0-2
				1880	18900	21.29	23	0-2
				1900	19100	21.33	23	0-2
			50	1860	18700	21.17	23	0-2
				1880	18900	21.27	23	0-2
				1900	19100	21.31	23	0-2
		100RB		1860	18700	21.31	23	0-2
				1880	18900	21.27	23	0-2
				1900	19100	21.36	23	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	1857.5	18675	23.07	25	0
				1880	18900	23.10	25	0
				1902.5	19125	23.36	25	0
			36	1857.5	18675	23.07	25	0
				1880	18900	23.02	25	0
				1902.5	19125	23.24	25	0
			74	1857.5	18675	23.07	25	0
				1880	18900	23.24	25	0
				1902.5	19125	23.07	25	0
		36 RB	0	1857.5	18675	22.20	24	0-1
				1880	18900	22.17	24	0-1
				1902.5	19125	22.21	24	0-1
			18	1857.5	18675	22.23	24	0-1
				1880	18900	22.08	24	0-1
				1902.5	19125	22.18	24	0-1
			37	1857.5	18675	22.18	24	0-1
				1880	18900	22.25	24	0-1
				1902.5	19125	22.21	24	0-1
		75RB		1857.5	18675	22.20	24	0-1
				1880	18900	22.22	24	0-1
				1902.5	19125	22.26	24	0-1
	16-QAM	1 RB	0	1857.5	18675	22.03	24	0-1
				1880	18900	22.09	24	0-1
				1902.5	19125	22.46	24	0-1
			36	1857.5	18675	22.02	24	0-1
				1880	18900	22.01	24	0-1
				1902.5	19125	22.29	24	0-1
			74	1857.5	18675	22.07	24	0-1
				1880	18900	22.00	24	0-1
				1902.5	19125	22.06	24	0-1
		36 RB	0	1857.5	18675	21.16	23	0-2
				1880	18900	21.18	23	0-2
				1902.5	19125	21.23	23	0-2
			18	1857.5	18675	21.15	23	0-2
				1880	18900	21.16	23	0-2
				1902.5	19125	21.25	23	0-2
			37	1857.5	18675	21.13	23	0-2
				1880	18900	21.17	23	0-2
				1902.5	19125	21.26	23	0-2
		75RB		1857.5	18675	21.14	23	0-2
				1880	18900	21.16	23	0-2
				1902.5	19125	21.23	23	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	1855	18650	23.10	25	0
				1880	18900	23.00	25	0
				1905	19150	23.33	25	0
			25	1855	18650	23.30	25	0
				1880	18900	23.10	25	0
				1905	19150	23.08	25	0
			49	1855	18650	23.07	25	0
				1880	18900	23.12	25	0
				1905	19150	23.02	25	0
		25 RB	0	1855	18650	22.07	24	0-1
				1880	18900	22.13	24	0-1
				1905	19150	22.25	24	0-1
			12	1855	18650	22.11	24	0-1
				1880	18900	22.03	24	0-1
				1905	19150	22.04	24	0-1
			25	1855	18650	22.17	24	0-1
				1880	18900	22.22	24	0-1
				1905	19150	22.08	24	0-1
		50RB		1855	18650	22.16	24	0-1
				1880	18900	22.05	24	0-1
				1905	19150	22.18	24	0-1
	16-QAM	1 RB	0	1855	18650	22.03	24	0-1
				1880	18900	22.06	24	0-1
				1905	19150	22.00	24	0-1
			25	1855	18650	22.10	24	0-1
				1880	18900	22.08	24	0-1
				1905	19150	22.01	24	0-1
			49	1855	18650	22.06	24	0-1
				1880	18900	22.45	24	0-1
				1905	19150	22.00	24	0-1
		25 RB	0	1855	18650	21.19	23	0-2
				1880	18900	21.32	23	0-2
				1905	19150	21.25	23	0-2
			12	1855	18650	21.34	23	0-2
				1880	18900	21.31	23	0-2
				1905	19150	21.24	23	0-2
			25	1855	18650	21.31	23	0-2
				1880	18900	21.22	23	0-2
				1905	19150	21.21	23	0-2
		50RB		1855	18650	21.18	23	0-2
				1880	18900	21.08	23	0-2
				1905	19150	21.24	23	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	1852.5	18625	23.07	25	0
				1880	18900	23.01	25	0
				1907.5	19175	23.05	25	0
			12	1852.5	18625	23.05	25	0
				1880	18900	23.07	25	0
				1907.5	19175	23.09	25	0
			24	1852.5	18625	23.07	25	0
				1880	18900	23.05	25	0
				1907.5	19175	23.10	25	0
		12 RB	0	1852.5	18625	22.04	24	0-1
				1880	18900	22.13	24	0-1
				1907.5	19175	22.18	24	0-1
			6	1852.5	18625	22.05	24	0-1
				1880	18900	22.08	24	0-1
				1907.5	19175	22.06	24	0-1
			13	1852.5	18625	22.04	24	0-1
				1880	18900	22.11	24	0-1
				1907.5	19175	22.07	24	0-1
		25RB		1852.5	18625	22.01	24	0-1
				1880	18900	22.05	24	0-1
				1907.5	19175	22.13	24	0-1
	16-QAM	1 RB	0	1852.5	18625	22.00	24	0-1
				1880	18900	22.02	24	0-1
				1907.5	19175	22.05	24	0-1
			12	1852.5	18625	22.09	24	0-1
				1880	18900	22.00	24	0-1
				1907.5	19175	22.02	24	0-1
			24	1852.5	18625	22.09	24	0-1
				1880	18900	22.04	24	0-1
				1907.5	19175	22.07	24	0-1
		12 RB	0	1852.5	18625	22.08	23	0-2
				1880	18900	21.04	23	0-2
				1907.5	19175	21.23	23	0-2
			6	1852.5	18625	21.16	23	0-2
				1880	18900	21.10	23	0-2
				1907.5	19175	21.19	23	0-2
			13	1852.5	18625	21.28	23	0-2
				1880	18900	21.23	23	0-2
				1907.5	19175	21.20	23	0-2
		25RB		1852.5	18625	21.13	23	0-2
				1880	18900	21.15	23	0-2
				1907.5	19175	21.18	23	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	1851.5	18615	23.18	25	0
				1880	18900	23.08	25	0
				1908.5	19185	23.01	25	0
			7	1851.5	18615	23.30	25	0
				1880	18900	23.06	25	0
				1908.5	19185	23.08	25	0
			14	1851.5	18615	23.02	25	0
				1880	18900	23.05	25	0
				1908.5	19185	23.06	25	0
		8 RB	0	1851.5	18615	22.04	24	0-1
				1880	18900	23.02	24	0-1
				1908.5	19185	22.12	24	0-1
			4	1851.5	18615	22.13	24	0-1
				1880	18900	22.05	24	0-1
				1908.5	19185	22.01	24	0-1
			7	1851.5	18615	22.13	24	0-1
				1880	18900	22.09	24	0-1
				1908.5	19185	22.02	24	0-1
		15RB		1851.5	18615	22.19	24	0-1
				1880	18900	22.00	24	0-1
				1908.5	19185	22.01	24	0-1
	16-QAM	1 RB	0	1851.5	18615	22.05	24	0-1
				1880	18900	22.02	24	0-1
				1908.5	19185	22.04	24	0-1
			7	1851.5	18615	22.07	24	0-1
				1880	18900	22.06	24	0-1
				1908.5	19185	22.07	24	0-1
			14	1851.5	18615	22.08	24	0-1
				1880	18900	22.05	24	0-1
				1908.5	19185	22.08	24	0-1
		8 RB	0	1851.5	18615	21.19	23	0-2
				1880	18900	21.06	23	0-2
				1908.5	19185	21.13	23	0-2
			4	1851.5	18615	21.28	23	0-2
				1880	18900	22.01	23	0-2
				1908.5	19185	21.09	23	0-2
			7	1851.5	18615	21.28	23	0-2
				1880	18900	21.14	23	0-2
				1908.5	19185	21.02	23	0-2
		15RB		1851.5	18615	21.20	23	0-2
				1880	18900	22.08	23	0-2
				1908.5	19185	22.09	23	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	1850.7	18607	23.04	25	0
				1880	18900	23.01	25	0
				1909.3	19193	23.08	25	0
			2	1850.7	18607	23.13	25	0
				1880	18900	23.17	25	0
				1909.3	19193	23.01	25	0
			5	1850.7	18607	23.07	25	0
				1880	18900	23.07	25	0
				1909.3	19193	23.00	25	0
		3 RB	0	1850.7	18607	23.28	24	0-1
				1880	18900	23.04	24	0-1
				1909.3	19193	22.93	24	0-1
			2	1850.7	18607	23.07	24	0-1
				1880	18900	23.07	24	0-1
				1909.3	19193	22.95	24	0-1
			3	1850.7	18607	23.13	24	0-1
				1880	18900	23.02	24	0-1
				1909.3	19193	22.99	24	0-1
		6RB		1850.7	18607	22.11	24	0-1
				1880	18900	22.08	24	0-1
				1909.3	19193	22.07	24	0-1
	16-QAM	1 RB	0	1850.7	18607	22.08	24	0-1
				1880	18900	22.09	24	0-1
				1909.3	19193	22.08	24	0-1
			2	1850.7	18607	22.04	24	0-1
				1880	18900	22.01	24	0-1
				1909.3	19193	22.09	24	0-1
			5	1850.7	18607	22.06	24	0-1
				1880	18900	22.04	24	0-1
				1909.3	19193	22.07	24	0-1
		3 RB	0	1850.7	18607	22.30	24	0-1
				1880	18900	22.19	24	0-1
				1909.3	19193	22.03	24	0-1
			2	1850.7	18607	22.38	24	0-1
				1880	18900	22.21	24	0-1
				1909.3	19193	22.03	24	0-1
			3	1850.7	18607	22.32	24	0-1
				1880	18900	22.08	24	0-1
				1909.3	19193	22.08	24	0-1
		6RB		1850.7	18607	21.09	23	0-2
				1880	18900	21.14	23	0-2
				1909.3	19193	21.04	23	0-2

FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	1720	20050	22.42	24	0
				1732.5	20175	22.64	24	0
				1745	20300	22.68	24	0
			50	1720	20050	22.41	24	0
				1732.5	20175	22.86	24	0
				1745	20300	23.03	24	0
			99	1720	20050	22.67	24	0
				1732.5	20175	22.38	24	0
				1745	20300	22.82	24	0
		50 RB	0	1720	20050	21.80	23	0-1
				1732.5	20175	21.93	23	0-1
				1745	20300	22.18	23	0-1
			25	1720	20050	21.92	23	0-1
				1732.5	20175	22.01	23	0-1
				1745	20300	21.95	23	0-1
			50	1720	20050	22.03	23	0-1
				1732.5	20175	21.96	23	0-1
				1745	20300	21.91	23	0-1
		100RB		1720	20050	22.05	23	0-1
				1732.5	20175	21.98	23	0-1
				1745	20300	22.00	23	0-1
	16-QAM	1 RB	0	1720	20050	21.73	23	0-1
				1732.5	20175	21.87	23	0-1
				1745	20300	21.92	23	0-1
			50	1720	20050	21.99	23	0-1
				1732.5	20175	22.34	23	0-1
				1745	20300	21.91	23	0-1
			99	1720	20050	21.62	23	0-1
				1732.5	20175	21.67	23	0-1
				1745	20300	21.67	23	0-1
		50 RB	0	1720	20050	20.90	22	0-2
				1732.5	20175	20.82	22	0-2
				1745	20300	21.12	22	0-2
			25	1720	20050	20.84	22	0-2
				1732.5	20175	20.92	22	0-2
				1745	20300	21.06	22	0-2
			50	1720	20050	20.83	22	0-2
				1732.5	20175	21.06	22	0-2
				1745	20300	21.03	22	0-2
		100RB		1720	20050	20.84	22	0-2
				1732.5	20175	20.98	22	0-2
				1745	20300	20.92	22	0-2

FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	1717.5	20025	22.82	24	0
				1732.5	20175	22.73	24	0
				1747.5	20325	22.70	24	0
			36	1717.5	20025	22.71	24	0
				1732.5	20175	22.59	24	0
				1747.5	20325	22.81	24	0
			74	1717.5	20025	22.63	24	0
				1732.5	20175	22.63	24	0
				1747.5	20325	22.68	24	0
		36 RB	0	1717.5	20025	21.89	23	0-1
				1732.5	20175	22.05	23	0-1
				1747.5	20325	21.96	23	0-1
			18	1717.5	20025	21.85	23	0-1
				1732.5	20175	21.98	23	0-1
				1747.5	20325	21.91	23	0-1
			37	1717.5	20025	21.92	23	0-1
				1732.5	20175	22.04	23	0-1
				1747.5	20325	21.84	23	0-1
		75RB		1717.5	20025	21.92	23	0-1
				1732.5	20175	22.06	23	0-1
				1747.5	20325	21.85	23	0-1
	16-QAM	1 RB	0	1717.5	20025	21.68	23	0-1
				1732.5	20175	21.78	23	0-1
				1747.5	20325	21.84	23	0-1
			36	1717.5	20025	21.70	23	0-1
				1732.5	20175	21.67	23	0-1
				1747.5	20325	21.59	23	0-1
			74	1717.5	20025	21.59	23	0-1
				1732.5	20175	21.65	23	0-1
				1747.5	20325	21.74	23	0-1
		36 RB	0	1717.5	20025	20.88	22	0-2
				1732.5	20175	20.92	22	0-2
				1747.5	20325	21.05	22	0-2
			18	1717.5	20025	20.94	22	0-2
				1732.5	20175	20.97	22	0-2
				1747.5	20325	21.01	22	0-2
			37	1717.5	20025	20.90	22	0-2
				1732.5	20175	21.05	22	0-2
				1747.5	20325	20.77	22	0-2
		75RB		1717.5	20025	20.91	22	0-2
				1732.5	20175	20.94	22	0-2
				1747.5	20325	20.96	22	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	1715	20000	22.51	24	0
				1732.5	20175	22.64	24	0
				1750	20350	22.77	24	0
			25	1715	20000	22.83	24	0
				1732.5	20175	22.82	24	0
				1750	20350	22.65	24	0
			49	1715	20000	22.43	24	0
				1732.5	20175	22.47	24	0
				1750	20350	22.56	24	0
		25 RB	0	1715	20000	22.05	23	0-1
				1732.5	20175	22.01	23	0-1
				1750	20350	21.98	23	0-1
			12	1715	20000	21.97	23	0-1
				1732.5	20175	21.99	23	0-1
				1750	20350	21.92	23	0-1
			25	1715	20000	21.87	23	0-1
				1732.5	20175	21.98	23	0-1
				1750	20350	21.78	23	0-1
		50RB		1715	20000	21.87	23	0-1
				1732.5	20175	21.97	23	0-1
				1750	20350	21.90	23	0-1
	16-QAM	1 RB	0	1715	20000	21.68	23	0-1
				1732.5	20175	21.72	23	0-1
				1750	20350	21.79	23	0-1
			25	1715	20000	21.84	23	0-1
				1732.5	20175	21.79	23	0-1
				1750	20350	21.83	23	0-1
			49	1715	20000	21.73	23	0-1
				1732.5	20175	21.70	23	0-1
				1750	20350	21.81	23	0-1
		25 RB	0	1715	20000	21.15	22	0-2
				1732.5	20175	20.88	22	0-2
				1750	20350	21.09	22	0-2
			12	1715	20000	21.08	22	0-2
				1732.5	20175	21.09	22	0-2
				1750	20350	21.03	22	0-2
			25	1715	20000	21.06	22	0-2
				1732.5	20175	20.98	22	0-2
				1750	20350	20.95	22	0-2
		50RB		1715	20000	20.96	22	0-2
				1732.5	20175	20.96	22	0-2
				1750	20350	20.85	22	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	1712.5	19975	22.81	24	0
				1732.5	20175	22.47	24	0
				1752.5	20375	22.90	24	0
			12	1712.5	19975	22.66	24	0
				1732.5	20175	22.64	24	0
				1752.5	20375	22.61	24	0
			24	1712.5	19975	22.75	24	0
				1732.5	20175	22.52	24	0
				1752.5	20375	22.61	24	0
		12 RB	0	1712.5	19975	21.79	23	0-1
				1732.5	20175	21.84	23	0-1
				1752.5	20375	21.80	23	0-1
			6	1712.5	19975	21.76	23	0-1
				1732.5	20175	21.99	23	0-1
				1752.5	20375	21.76	23	0-1
			13	1712.5	19975	21.90	23	0-1
				1732.5	20175	21.98	23	0-1
				1752.5	20375	21.84	23	0-1
		25RB		1712.5	19975	21.91	23	0-1
				1732.5	20175	21.84	23	0-1
				1752.5	20375	21.92	23	0-1
	16-QAM	1 RB	0	1712.5	19975	21.50	23	0-1
				1732.5	20175	21.74	23	0-1
				1752.5	20375	21.59	23	0-1
			12	1712.5	19975	21.64	23	0-1
				1732.5	20175	21.40	23	0-1
				1752.5	20375	21.30	23	0-1
			24	1712.5	19975	21.51	23	0-1
				1732.5	20175	21.71	23	0-1
				1752.5	20375	21.81	23	0-1
		12 RB	0	1712.5	19975	20.99	22	0-2
				1732.5	20175	20.83	22	0-2
				1752.5	20375	20.92	22	0-2
			6	1712.5	19975	20.86	22	0-2
				1732.5	20175	20.86	22	0-2
				1752.5	20375	20.79	22	0-2
			13	1712.5	19975	20.90	22	0-2
				1732.5	20175	20.85	22	0-2
				1752.5	20375	20.82	22	0-2
		25RB		1712.5	19975	21.21	22	0-2
				1732.5	20175	20.94	22	0-2
				1752.5	20375	21.07	22	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	1711.5	19965	22.59	24	0
				1732.5	20175	22.93	24	0
				1753.5	20385	22.49	24	0
			7	1711.5	19965	22.72	24	0
				1732.5	20175	23.00	24	0
				1753.5	20385	22.59	24	0
			14	1711.5	19965	22.79	24	0
				1732.5	20175	22.78	24	0
				1753.5	20385	22.65	24	0
		8 RB	0	1711.5	19965	21.93	23	0-1
				1732.5	20175	21.99	23	0-1
				1753.5	20385	21.91	23	0-1
			4	1711.5	19965	21.94	23	0-1
				1732.5	20175	21.98	23	0-1
				1753.5	20385	21.84	23	0-1
			7	1711.5	19965	21.97	23	0-1
				1732.5	20175	21.90	23	0-1
				1753.5	20385	21.76	23	0-1
		15RB		1711.5	19965	21.92	23	0-1
				1732.5	20175	21.96	23	0-1
				1753.5	20385	21.75	23	0-1
	16-QAM	1 RB	0	1711.5	19965	21.66	23	0-1
				1732.5	20175	21.69	23	0-1
				1753.5	20385	21.52	23	0-1
			7	1711.5	19965	21.55	23	0-1
				1732.5	20175	21.66	23	0-1
				1753.5	20385	21.33	23	0-1
			14	1711.5	19965	21.64	23	0-1
				1732.5	20175	21.77	23	0-1
				1753.5	20385	21.20	23	0-1
		8 RB	0	1711.5	19965	21.00	22	0-2
				1732.5	20175	21.07	22	0-2
				1753.5	20385	20.91	22	0-2
			4	1711.5	19965	21.02	22	0-2
				1732.5	20175	21.05	22	0-2
				1753.5	20385	20.87	22	0-2
			7	1711.5	19965	21.08	22	0-2
				1732.5	20175	21.05	22	0-2
				1753.5	20385	20.79	22	0-2
		15RB		1711.5	19965	21.03	22	0-2
				1732.5	20175	20.96	22	0-2
				1753.5	20385	20.82	22	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	1710.7	19957	22.48	24	0
				1732.5	20175	22.77	24	0
				1754.3	20393	22.68	24	0
			2	1710.7	19957	22.68	24	0
				1732.5	20175	22.69	24	0
				1754.3	20393	22.64	24	0
			5	1710.7	19957	22.71	24	0
				1732.5	20175	22.77	24	0
				1754.3	20393	22.67	24	0
		3 RB	0	1710.7	19957	22.79	23	0-1
				1732.5	20175	22.87	23	0-1
				1754.3	20393	22.66	23	0-1
			2	1710.7	19957	22.76	23	0-1
				1732.5	20175	22.89	23	0-1
				1754.3	20393	22.61	23	0-1
			3	1710.7	19957	22.67	23	0-1
				1732.5	20175	22.84	23	0-1
				1754.3	20393	22.65	23	0-1
		6RB		1710.7	19957	21.89	23	0-1
				1732.5	20175	21.87	23	0-1
				1754.3	20393	21.79	23	0-1
	16-QAM	1 RB	0	1710.7	19957	21.61	23	0-1
				1732.5	20175	21.73	23	0-1
				1754.3	20393	21.73	23	0-1
			2	1710.7	19957	21.48	23	0-1
				1732.5	20175	21.75	23	0-1
				1754.3	20393	21.79	23	0-1
			5	1710.7	19957	21.64	23	0-1
				1732.5	20175	21.79	23	0-1
				1754.3	20393	21.67	23	0-1
		3 RB	0	1710.7	19957	21.93	22	0-1
				1732.5	20175	21.97	22	0-1
				1754.3	20393	21.70	22	0-1
			2	1710.7	19957	21.97	22	0-1
				1732.5	20175	21.97	22	0-1
				1754.3	20393	21.63	22	0-1
			3	1710.7	19957	21.92	22	0-1
				1732.5	20175	21.96	22	0-1
				1754.3	20393	21.77	22	0-1
		6RB		1710.7	19957	20.98	22	0-2
				1732.5	20175	20.74	22	0-2
				1754.3	20393	20.73	22	0-2

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	829	20450	23.60	25	0
				836.5	20525	23.60	25	0
				844	20600	23.47	25	0
			25	829	20450	23.80	25	0
				836.5	20525	23.77	25	0
				844	20600	23.55	25	0
			49	829	20450	23.39	25	0
				836.5	20525	23.57	25	0
				844	20600	23.57	25	0
		25 RB	0	829	20450	22.76	24	0-1
				836.5	20525	22.73	24	0-1
				844	20600	22.80	24	0-1
			12	829	20450	22.73	24	0-1
				836.5	20525	22.87	24	0-1
				844	20600	22.69	24	0-1
			25	829	20450	22.75	24	0-1
				836.5	20525	22.82	24	0-1
				844	20600	22.74	24	0-1
		50RB		829	20450	22.69	24	0-1
				836.5	20525	22.77	24	0-1
				844	20600	22.72	24	0-1
	16-QAM	1 RB	0	829	20450	22.47	24	0-1
				836.5	20525	22.57	24	0-1
				844	20600	22.95	24	0-1
			25	829	20450	22.65	24	0-1
				836.5	20525	22.54	24	0-1
				844	20600	22.70	24	0-1
			49	829	20450	22.35	24	0-1
				836.5	20525	22.49	24	0-1
				844	20600	22.52	24	0-1
		25 RB	0	829	20450	21.72	23	0-2
				836.5	20525	21.79	23	0-2
				844	20600	21.74	23	0-2
			12	829	20450	21.88	23	0-2
				836.5	20525	21.84	23	0-2
				844	20600	21.62	23	0-2
			25	829	20450	21.91	23	0-2
				836.5	20525	21.86	23	0-2
				844	20600	21.70	23	0-2
		50RB		829	20450	21.85	23	0-2
				836.5	20525	21.83	23	0-2
				844	20600	21.79	23	0-2

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	826.5	20425	23.42	25	0
				836.5	20525	23.78	25	0
				846.5	20625	23.51	25	0
			12	826.5	20425	23.70	25	0
				836.5	20525	23.61	25	0
				846.5	20625	23.67	25	0
			24	826.5	20425	23.32	25	0
				836.5	20525	23.70	25	0
				846.5	20625	23.75	25	0
		12 RB	0	826.5	20425	22.70	24	0-1
				836.5	20525	22.71	24	0-1
				846.5	20625	22.74	24	0-1
			6	826.5	20425	22.74	24	0-1
				836.5	20525	22.77	24	0-1
				846.5	20625	22.70	24	0-1
			13	826.5	20425	22.65	24	0-1
				836.5	20525	22.75	24	0-1
				846.5	20625	22.75	24	0-1
		25RB		826.5	20425	22.70	24	0-1
				836.5	20525	22.79	24	0-1
				846.5	20625	22.75	24	0-1
	16-QAM	1 RB	0	826.5	20425	22.36	24	0-1
				836.5	20525	22.30	24	0-1
				846.5	20625	22.49	24	0-1
			12	826.5	20425	22.42	24	0-1
				836.5	20525	22.65	24	0-1
				846.5	20625	22.44	24	0-1
			24	826.5	20425	22.36	24	0-1
				836.5	20525	22.37	24	0-1
				846.5	20625	22.34	24	0-1
		12 RB	0	826.5	20425	21.60	23	0-2
				836.5	20525	21.59	23	0-2
				846.5	20625	21.74	23	0-2
			6	826.5	20425	21.50	23	0-2
				836.5	20525	21.74	23	0-2
				846.5	20625	21.59	23	0-2
			13	826.5	20425	21.54	23	0-2
				836.5	20525	21.71	23	0-2
				846.5	20625	21.72	23	0-2
		25RB		826.5	20425	21.56	23	0-2
				836.5	20525	21.66	23	0-2
				846.5	20625	21.73	23	0-2

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	825.5	20415	23.79	25	0
				836.5	20525	23.74	25	0
				847.5	20635	23.70	25	0
			7	825.5	20415	23.84	25	0
				836.5	20525	23.63	25	0
				847.5	20635	23.66	25	0
			14	825.5	20415	23.36	25	0
				836.5	20525	23.61	25	0
				847.5	20635	23.59	25	0
		8 RB	0	825.5	20415	22.73	24	0-1
				836.5	20525	22.82	24	0-1
				847.5	20635	22.80	24	0-1
			4	825.5	20415	22.70	24	0-1
				836.5	20525	22.79	24	0-1
				847.5	20635	22.77	24	0-1
			7	825.5	20415	22.70	24	0-1
				836.5	20525	22.84	24	0-1
				847.5	20635	22.75	24	0-1
		15RB		825.5	20415	22.76	24	0-1
				836.5	20525	22.87	24	0-1
				847.5	20635	22.74	24	0-1
	16-QAM	1 RB	0	825.5	20415	22.46	24	0-1
				836.5	20525	22.61	24	0-1
				847.5	20635	22.53	24	0-1
			7	825.5	20415	22.31	24	0-1
				836.5	20525	22.33	24	0-1
				847.5	20635	22.40	24	0-1
			14	825.5	20415	22.44	24	0-1
				836.5	20525	22.59	24	0-1
				847.5	20635	22.36	24	0-1
		8 RB	0	825.5	20415	21.78	23	0-2
				836.5	20525	21.71	23	0-2
				847.5	20635	21.80	23	0-2
			4	825.5	20415	21.68	23	0-2
				836.5	20525	21.75	23	0-2
				847.5	20635	21.77	23	0-2
			7	825.5	20415	21.69	23	0-2
				836.5	20525	21.80	23	0-2
				847.5	20635	21.76	23	0-2
		15RB		825.5	20415	21.52	23	0-2
				836.5	20525	21.78	23	0-2
				847.5	20635	21.81	23	0-2

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	824.7	20407	23.64	25	0
				836.5	20525	23.60	25	0
				848.3	20643	23.73	25	0
			2	824.7	20407	23.73	25	0
				836.5	20525	23.74	25	0
				848.3	20643	23.78	25	0
			5	824.7	20407	23.54	25	0
				836.5	20525	23.57	25	0
				848.3	20643	23.64	25	0
		3 RB	0	824.7	20407	23.66	25	0-1
				836.5	20525	23.56	25	0-1
				848.3	20643	23.72	25	0-1
			2	824.7	20407	23.69	25	0-1
				836.5	20525	23.67	25	0-1
				848.3	20643	23.70	25	0-1
			3	824.7	20407	23.78	25	0-1
				836.5	20525	23.65	25	0-1
				848.3	20643	23.65	25	0-1
		6RB		824.7	20407	22.73	24	0-1
				836.5	20525	22.66	24	0-1
				848.3	20643	22.76	24	0-1
	16-QAM	1 RB	0	824.7	20407	22.83	24	0-1
				836.5	20525	22.42	24	0-1
				848.3	20643	22.52	24	0-1
			2	824.7	20407	22.92	24	0-1
				836.5	20525	22.45	24	0-1
				848.3	20643	22.57	24	0-1
			5	824.7	20407	22.87	24	0-1
				836.5	20525	22.48	24	0-1
				848.3	20643	22.45	24	0-1
		3 RB	0	824.7	20407	22.87	24	0-1
				836.5	20525	22.69	24	0-1
				848.3	20643	22.75	24	0-1
			2	824.7	20407	22.81	24	0-1
				836.5	20525	22.81	24	0-1
				848.3	20643	22.76	24	0-1
			3	824.7	20407	22.61	24	0-1
				836.5	20525	22.79	24	0-1
				848.3	20643	22.70	24	0-1
		6RB		824.7	20407	21.63	23	0-2
				836.5	20525	21.69	23	0-2
				848.3	20643	21.78	23	0-2

FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	2510	20850	20.41	22	0
				2535	21100	20.34	22	0
				2560	21350	20.00	22	0
			50	2510	20850	20.37	22	0
				2535	21100	20.37	22	0
				2560	21350	20.29	22	0
			99	2510	20850	20.26	22	0
				2535	21100	20.25	22	0
				2560	21350	20.40	22	0
		50 RB	0	2510	20850	20.35	22	0
				2535	21100	20.34	22	0
				2560	21350	20.33	22	0
			25	2510	20850	20.24	22	0
				2535	21100	20.29	22	0
				2560	21350	20.31	22	0
			50	2510	20850	20.26	22	0
				2535	21100	20.28	22	0
				2560	21350	20.32	22	0
		100RB		2510	20850	20.39	22	0
				2535	21100	20.26	22	0
				2560	21350	20.38	22	0
	16-QAM	1 RB	0	2510	20850	20.27	22	0
				2535	21100	20.35	22	0
				2560	21350	20.27	22	0
			50	2510	20850	20.21	22	0
				2535	21100	20.29	22	0
				2560	21350	20.38	22	0
			99	2510	20850	20.21	22	0
				2535	21100	20.29	22	0
				2560	21350	20.38	22	0
		50 RB	0	2510	20850	20.31	22	0
				2535	21100	20.23	22	0
				2560	21350	20.37	22	0
			25	2510	20850	20.23	22	0
				2535	21100	20.22	22	0
				2560	21350	20.27	22	0
			50	2510	20850	20.37	22	0
				2535	21100	20.34	22	0
				2560	21350	20.28	22	0
		100RB		2510	20850	20.38	22	0
				2535	21100	20.25	22	0
				2560	21350	20.27	22	0

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FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	2507.5	20825	20.37	22	0
				2535	21100	20.24	22	0
				2562.5	21375	20.20	22	0
			36	2507.5	20825	20.33	22	0
				2535	21100	20.31	22	0
				2562.5	21375	20.24	22	0
			74	2507.5	20825	20.33	22	0
				2535	21100	20.34	22	0
				2562.5	21375	20.28	22	0
		36 RB	0	2507.5	20825	20.38	22	0
				2535	21100	20.27	22	0
				2562.5	21375	20.24	22	0
			18	2507.5	20825	20.39	22	0
				2535	21100	20.23	22	0
				2562.5	21375	20.36	22	0
			37	2507.5	20825	20.38	22	0
				2535	21100	20.24	22	0
				2562.5	21375	20.32	22	0
		75RB		2507.5	20825	20.28	22	0
				2535	21100	20.27	22	0
				2562.5	21375	20.21	22	0
	16-QAM	1 RB	0	2507.5	20825	20.21	22	0
				2535	21100	20.32	22	0
				2562.5	21375	20.36	22	0
			36	2507.5	20825	20.31	22	0
				2535	21100	20.37	22	0
				2562.5	21375	20.29	22	0
			74	2507.5	20825	20.26	22	0
				2535	21100	20.28	22	0
				2562.5	21375	20.27	22	0
		36 RB	0	2507.5	20825	20.22	22	0
				2535	21100	20.28	22	0
				2562.5	21375	20.21	22	0
			18	2507.5	20825	20.33	22	0
				2535	21100	20.29	22	0
				2562.5	21375	20.30	22	0
			37	2507.5	20825	20.21	22	0
				2535	21100	20.21	22	0
				2562.5	21375	20.26	22	0
		75RB		2507.5	20825	20.23	22	0
				2535	21100	20.20	22	0
				2562.5	21375	20.37	22	0

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FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	2505	20800	20.22	22	0
				2535	21100	20.21	22	0
				2565	21400	20.38	22	0
			25	2505	20800	20.23	22	0
				2535	21100	20.21	22	0
				2565	21400	20.26	22	0
			49	2505	20800	20.32	22	0
				2535	21100	20.22	22	0
				2565	21400	20.30	22	0
		25 RB	0	2505	20800	20.31	22	0
				2535	21100	20.36	22	0
				2565	21400	20.34	22	0
			12	2505	20800	20.19	22	0
				2535	21100	20.29	22	0
				2565	21400	20.36	22	0
			25	2505	20800	20.34	22	0
				2535	21100	20.29	22	0
				2565	21400	20.24	22	0
		50RB		2505	20800	20.32	22	0
				2535	21100	20.29	22	0
				2565	21400	20.23	22	0
	16-QAM	1 RB	0	2505	20800	20.34	22	0
				2535	21100	20.36	22	0
				2565	21400	20.21	22	0
			25	2505	20800	20.32	22	0
				2535	21100	20.35	22	0
				2565	21400	20.31	22	0
			49	2505	20800	20.19	22	0
				2535	21100	20.26	22	0
				2565	21400	20.24	22	0
		25 RB	0	2505	20800	20.27	22	0
				2535	21100	20.36	22	0
				2565	21400	20.21	22	0
			12	2505	20800	20.31	22	0
				2535	21100	20.25	22	0
				2565	21400	20.32	22	0
			25	2505	20800	20.39	22	0
				2535	21100	20.38	22	0
				2565	21400	20.24	22	0
		50RB		2505	20800	20.30	22	0
				2535	21100	20.22	22	0
				2565	21400	20.38	22	0

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FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	2502.5	20775	20.20	22	0
				2535	21100	20.25	22	0
				2567.5	21425	20.32	22	0
			12	2502.5	20775	20.29	22	0
				2535	21100	20.26	22	0
				2567.5	21425	20.35	22	0
			24	2502.5	20775	20.20	22	0
				2535	21100	20.24	22	0
				2567.5	21425	20.29	22	0
		12 RB	0	2502.5	20775	20.23	22	0
				2535	21100	20.26	22	0
				2567.5	21425	20.28	22	0
			6	2502.5	20775	20.36	22	0
				2535	21100	20.29	22	0
				2567.5	21425	20.36	22	0
			13	2502.5	20775	20.24	22	0
				2535	21100	20.36	22	0
				2567.5	21425	20.26	22	0
		25RB		2502.5	20775	20.21	22	0
				2535	21100	20.39	22	0
				2567.5	21425	20.38	22	0
	16-QAM	1 RB	0	2502.5	20775	20.34	22	0
				2535	21100	20.20	22	0
				2567.5	21425	20.23	22	0
			12	2502.5	20775	20.21	22	0
				2535	21100	20.20	22	0
				2567.5	21425	20.33	22	0
			24	2502.5	20775	20.34	22	0
				2535	21100	20.20	22	0
				2567.5	21425	20.19	22	0
		12 RB	0	2502.5	20775	20.35	22	0
				2535	21100	20.21	22	0
				2567.5	21425	20.36	22	0
			6	2502.5	20775	20.35	22	0
				2535	21100	20.38	22	0
				2567.5	21425	20.28	22	0
			13	2502.5	20775	20.32	22	0
				2535	21100	20.35	22	0
				2567.5	21425	20.31	22	0
		25RB		2502.5	20775	20.26	22	0
				2535	21100	20.34	22	0
				2567.5	21425	20.27	22	0

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WLAN802.11 a/b/g/n/ac (20M/40M/80M) conducted power table:

Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2450 MHz	802.11b	1	2412	1Mbps	14.83	14.77
		6	2437		14.87	14.79
		11	2462		14.98	14.82
	802.11g	1	2412	6Mbps	11.31	11.21
		6	2437		12.90	12.80
		11	2462		12.23	12.17
	802.11n-HT20	1	2412	MCS0	11.87	11.81
		6	2437		11.97	11.84
		11	2462		11.92	11.74
	802.11n40-HT0	3	2422	MCS0	10.07	10.00
		6	2437		11.61	11.55
		9	2452		11.70	11.67

Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.15-5.25 GHz	802.11a	36	5180	6Mbps	14.78	14.37
		40	5200		14.91	14.35
		44	5220		14.76	14.52
		48	5240		14.91	14.36
	802.11n-HT20	36	5180	MCS0	11.84	11.56
		40	5200		11.96	11.54
		44	5220		11.96	11.74
		48	5240		11.67	11.55
	802.11ac20-VHT0	36	5180	MCS0	11.50	11.42
		40	5200		11.50	11.41
		44	5220		12.00	11.68
		48	5240		12.00	11.62
	802.11n-HT40	38	5190	MCS0	11.83	11.46
		46	5230		11.75	11.58
	802.11ac40-VHT0	38	5190	MCS0	12.00	11.62
		46	5230		12.00	11.55
	802.11ac80-VHT0	42	5210	MCS0	11.89	11.60

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Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.25-5.35 GHz	802.11a	52	5260	6Mbps	14.74	14.68
		56	5280		14.99	14.65
		60	5300		14.99	14.82
		64	5320		14.85	14.84
	802.11n-HT20	52	5260	MCS0	11.71	11.69
		56	5280		11.79	11.56
		60	5300		11.79	11.77
		64	5320		11.64	11.58
	802.11ac20-VHT0	52	5260	MCS0	12.00	11.54
		56	5280		12.00	11.53
		60	5300		12.00	11.65
		64	5320		12.00	11.54
	802.11n-HT40	54	5270	MCS0	11.63	11.60
		62	5310		11.71	11.45
	802.11ac40-VHT0	54	5270	MCS0	12.00	11.58
		62	5310		11.50	11.44
	802.11ac80-VHT0	58	5290	MCS0	11.96	11.76

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Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5600 MHz	802.11a	100	5500	6Mbps	14.97	14.87
		104	5520		14.97	14.69
		116	5580		14.94	14.70
		120	5600		14.97	14.67
		124	5620		14.97	14.65
		128	5640		14.97	14.63
		136	5680		14.97	14.68
		140	5700		14.97	14.69
	802.11n-HT20	100	5500	MCS0	11.94	11.87
		104	5520		11.97	11.85
		116	5580		11.97	11.88
		120	5600		11.97	11.81
		124	5620		11.97	11.79
		128	5640		11.97	11.77
		136	5680		11.97	11.84
	802.1ac20-VHT0	100	5500	MCS0	12.00	11.82
		104	5520		12.00	11.81
		116	5580		12.00	11.84
		120	5600		12.00	11.71
		124	5620		12.00	11.73
		128	5640		12.00	11.76
		136	5680		12.00	11.79
		140	5700		12.00	11.93
	802.11n-HT40	102	5510	MCS0	11.85	11.47
		110	5550		11.63	11.58
		118	5590		11.85	11.33
		126	5630		11.85	11.32
		134	5670		11.79	11.72
	802.11ac40-VHT0	102	5510	MCS0	11.50	11.42
		110	5550		12.00	11.53
		118	5590		12.00	11.41
		126	5630		12.00	11.35
		134	5670		12.00	11.68
	802.11ac80-VHT0	106	5530	MCS0	11.79	11.78
		122	5610		11.98	11.81

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Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5800 GHz	802.11a	149	5745	6Mbps	14.97	14.85
		157	5785		14.78	14.71
		165	5825		14.71	14.48
	802.11n20-HT0	149	5745	MCS0	11.92	11.89
		157	5785		11.93	11.82
		165	5825		11.85	11.68
	802.11ac20-VHT0	149	5745	MCS0	12.00	11.86
		157	5785		12.00	11.81
		165	5825		12.00	11.65
	802.11n40-HT0	151	5755	MCS0	11.83	11.76
		159	5795		11.96	11.81
	802.11ac40-VHT0	151	5755	MCS0	12.00	11.74
		159	5795		12.00	11.76
	802.11ac80-VHT0	155	5775	MCS0	11.65	11.62

Bluetooth maximum power table:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)			Max. Rated Avg. Power + Max. Tolerance (dBm)
			1Mbps	2Mbps	3Mbps	
BR/EDR	CH 00	2402	0.35	-1.63	-1.84	1.5
	CH 39	2441	1.30	-0.12	-0.33	
	CH 78	2480	-0.86	-2.99	-2.98	

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Max. Rated Avg. Power + Max. Tolerance (dBm)
			GFSK	
LE	CH 00	2402	-0.59	1
	CH 19	2440	0.78	
	CH 39	2480	-1.97	

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1.4 Test Environment

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

1.5 Operation Description

1. The EUT is controlled by using a Radio Communication Tester (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. SAR test reduction for GPRS mode is determined by the source-based time-averaged output power. The data mode with highest specified time-averaged output power should be tested for SAR compliance.

5. The 3G SAR test reduction procedure is applied to HSDPA with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSDPA) is ≤ ¼ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA). The following 4 sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (1)(2)	CM (3) (dB)	MPR (3) (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (4)	15/15 (4)	64	12/15 (4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{HS} = 30/15 * β_c.
Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{HS} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{HS} = 24/15 * β_c.
Note 3: CM = 1 for β_c/β_d = 12/15, β_{HS}/β_c = 24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

6. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) with 12.2 kbps RMC as the primary mode. Since the maximum output power

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in a secondary mode (HSPA) is ≤ ¼ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA). The following 5 sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{HS} (1)	β_{ec}	β_{ed} (4)(5)	β_{ed} (SF)	β_{ed} (Codes)	CM (2) (dB)	MPR (2)(6) (dB)	AG (5) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{HS} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{HS} = 5/15 * β_c.
Note 2: CM = 1 for β_c/β_d = 12/15, β_{HS}/β_c = 24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

7. LTE modes test according to **KDB 941225D05v02r05.**

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.

WLAN

802.11b DSSS SAR Test Requirements:

8. SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

9. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

802.11g/n OFDM SAR Test Exclusion Requirements:

10. SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

11. BT and WLAN use the same antenna path and Bluetooth can’t transmit with WLAN simultaneously.

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12. According to KDB447498D01v06, 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 ≤ 100MHz.

13. According to **KDB865664D01v01r04**, 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)

14. Product specific 10g-SAR for BT excluded as below:

Mode		BT
Max. tune-up power(dBm)		1.5
Max. tune-up power(mW)		1.413
All surfaces	Test separation distance (mm)	less than 5
	Calculation value	0.445
	Require SAR testing?	**No**

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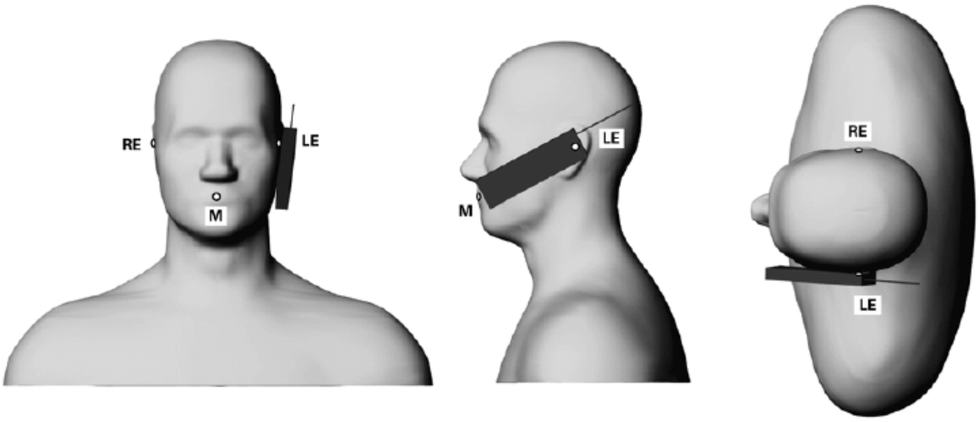
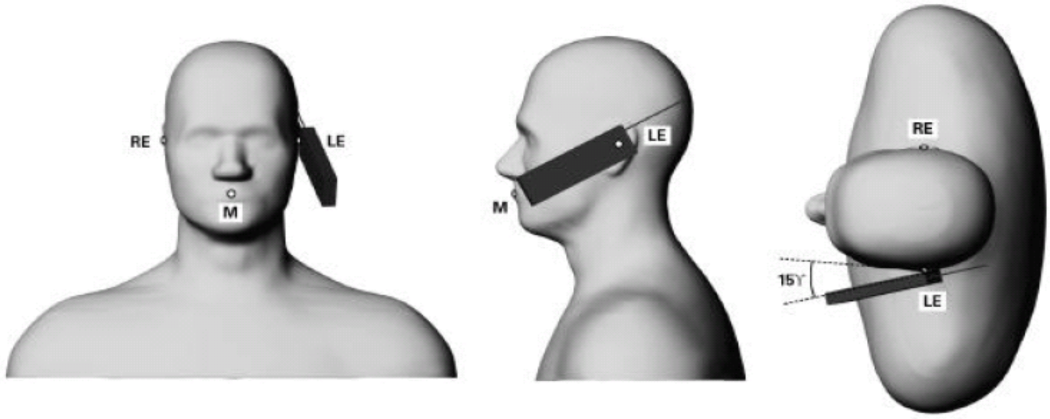
1.6 Positioning Procedure

Head SAR measurement statement



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



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

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

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Body SAR measurement statement

1. Body-worn exposure: 10mm
   Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

2. Hotspot exposure: 10mm
   A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge when the form factor of a handset is larger than 9 cm × 5 cm,
   Test configurations of WWAN:
   (1) Front side
   (2) Back side
   (3) Bottom side
   (4) Right side
   (5) Left side

   Test configurations of WLAN:
   (1) Front side
   (2) Back side
   (3) Top side
   (4) Left side
   (5) Right side

3. Phablet SAR test consideration
   Since the device is a phablet (overall diagonal dimension > 16.0 cm), the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for product specific 10-g SAR. When hotspot mode applies, product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg. Since the highest reported hotspot SAR for WWAN/WLAN 2.4GHz is less than 1.2 except for GPRS850, 10-g extremity SAR is only required for GPRS850 backside.
   For WLAN 5.2/5.3/5.6/5.8G, product specific 10g-SAR is required since hotspot function is not supported for them.

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4. Based on KDB941225D06v02r01, the hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. For WCDMA /LTE/WLAN, since the maximum power is the same between body-worn and hotspot mode, and the test distance of hotspot mode is the same with that of body-worn mode, hotspot mode SAR is used to support body-worn SAR. For GSM850/1900, since the wireless mode transmission configurations is different between body-worn and hotspot mode, body-worn SAR is performed.

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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

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interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found.

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

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1.8 Probe Calibration Procedures

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

1.8.1 Transfer Calibration with Temperature Probes

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

$$SAR = C\frac{\delta T}{\delta t},$$

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:

1. 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

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thermal equilibrium in the liquid. With a careful setup these errors can be kept small.

2. 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.
3. 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%.
4. 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].

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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:

1. The setup must enable accurate determination of the incident power.
2. The accuracy of the calculated field strength will depend on the assessment of the dielectric parameters of the liquid.
3. 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.

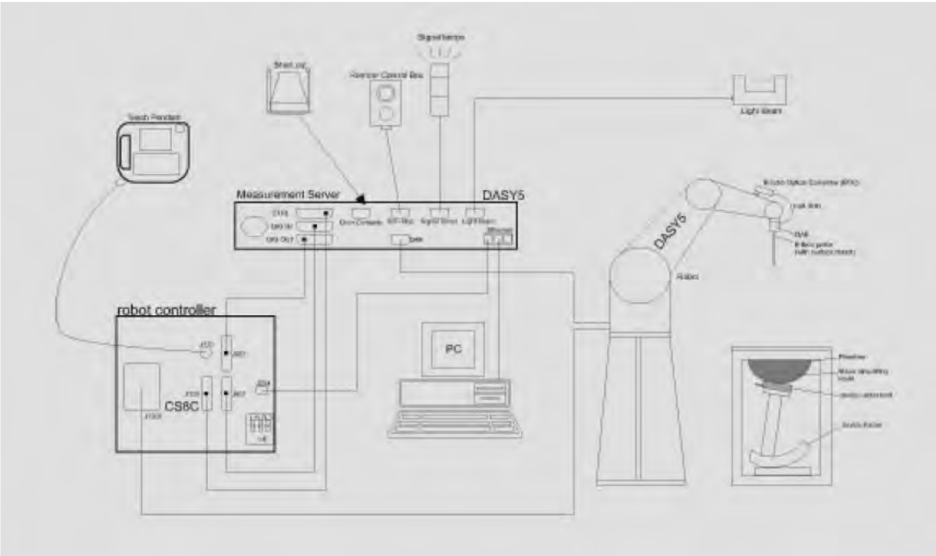

Fig. a A block diagram of the SAR measurement system

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

1. 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).
2. 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.
3. 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.
4. 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.
5. 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.
6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
7. A computer operating Windows7
8. DASY 5 software.
9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
10. The SAM twin phantom enabling testing left-hand and right-hand usage.
11. The device holder for handheld mobile phones.
12. Tissue simulating liquid mixed according to the given recipes.
13. Validation dipole kits allowing to validate the proper functioning of the system.

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1.10 System Components

EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL7835/1750/1900/2450/2600/5200/5300/5600/5800 MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.6 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic 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%.	

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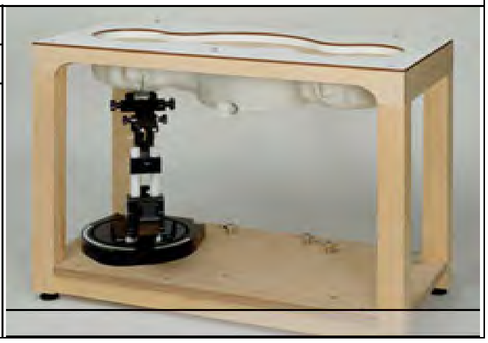
Phantom

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 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 KDB865664D01) from the target SAR values.

These tests were done at 835/1750/1900/2450/2600/5200/5300/5600/5800 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the 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.

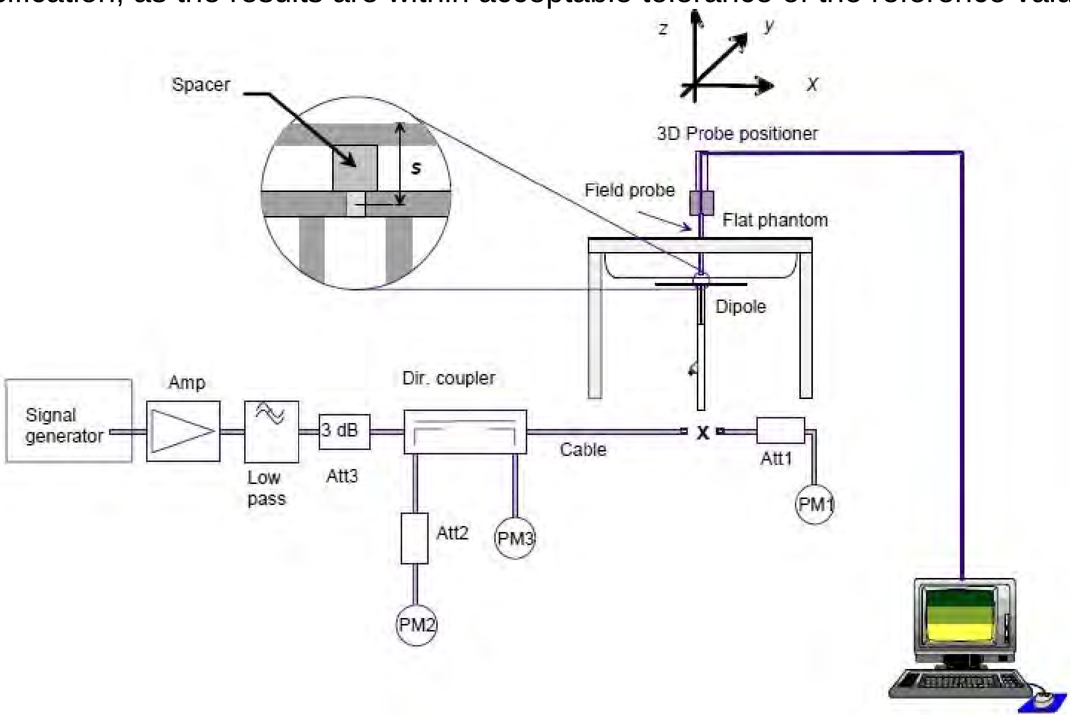


Fig. b The block diagram of system verification

Validation Kit	S/N	Frequency (MHz)		1W Target SAR-1g (mW/g)	Pin=250mW Measured SAR-1g (mW/g)	Measured SAR-1g normalized to 1W (mW/g)	Deviation (%)	Measured Date
D835V2	4d120	835	Head	9.37	2.41	9.64	2.88%	Nov. 06, 2018
			Body	9.58	2.42	9.68	1.04%	Nov. 15, 2018
D1750V2	1023	1750	Head	36.3	9.17	36.68	1.05%	Nov. 07, 2018
			Body	36.8	9.15	36.60	-0.54%	Nov. 16, 2018
D1900V2	5d173	1900	Head	40.7	9.86	39.44	-3.10%	Nov. 08, 2018
			Body	40.9	9.92	39.68	-2.98%	Nov. 17, 2018
D2450V2	727	2450	Head	52.1	12.80	51.20	-1.73%	Nov. 09, 2018
			Body	50.8	12.70	50.80	0.00%	Nov. 18, 2018
D2600V2	1005	2600	Head	56.8	14.20	56.80	0.00%	Nov. 10, 2018
			Body	54.4	13.90	55.60	2.21%	Nov. 19, 2018
Validation Kit	S/N	Frequency (MHz)		1W Target SAR-1g (mW/g)	Pin=100mW Measured SAR-1g (mW/g)	Measured SAR-1g normalized to 1W (mW/g)	Deviation (%)	Measured Date
D5GHzV2	1023	5200	Head	77.3	7.75	77.50	0.26%	Nov. 11, 2018
			Body	70.9	7.16	71.60	0.99%	Nov. 20, 2018
		5300	Head	80.9	8.05	80.50	-0.49%	Nov. 12, 2018
			Body	72.9	7.34	73.40	0.69%	Nov. 21, 2018
		5600	Head	81.9	8.18	81.80	-0.12%	Nov. 13, 2018
			Body	77.6	7.90	79.00	1.80%	Nov. 22, 2018
		5800	Head	79.0	7.82	78.20	-1.01%	Nov. 14, 2018
			Body	74.1	7.45	74.50	0.54%	Nov. 23, 2018

Table 1. Results of system validation

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1.12 Tissue Simulant Fluid for the Frequency Band

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

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Tissue Type	Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev εr	% dev σ
Head	Nov, 06. 2018	824.2	41.556	0.899	41.972	0.868	-1.00%	3.47%
		826.4	41.545	0.899	41.960	0.869	-1.00%	3.37%
		829	41.531	0.900	41.926	0.871	-0.95%	3.17%
		835	41.500	0.900	41.898	0.872	-0.96%	3.11%
		836.5	41.500	0.902	41.911	0.873	-0.99%	3.17%
		836.6	41.500	0.902	41.898	0.874	-0.96%	3.07%
		844	41.500	0.910	41.936	0.881	-1.05%	3.15%
		846.6	41.500	0.912	41.907	0.885	-0.98%	3.01%
		848.8	41.500	0.915	41.923	0.887	-1.02%	3.05%
	Nov, 07. 2018	1720	40.126	1.354	40.933	1.314	-2.01%	2.93%
		1732.5	40.107	1.361	40.893	1.320	-1.96%	3.01%
		1745	40.087	1.368	40.897	1.327	-2.02%	3.01%
		1750	40.079	1.371	40.885	1.330	-2.01%	2.99%
	Nov, 08. 2018	1850.2	40.000	1.400	41.208	1.353	-3.02%	3.36%
		1852.4	40.000	1.400	41.180	1.355	-2.95%	3.21%
		1860	40.000	1.400	41.181	1.356	-2.95%	3.14%
		1880	40.000	1.400	41.188	1.357	-2.97%	3.07%
		1900	40.000	1.400	41.220	1.358	-3.05%	3.00%
		1907.6	40.000	1.400	41.204	1.359	-3.01%	2.93%
		1909.8	40.000	1.400	41.200	1.402	-3.00%	-0.14%
	Nov, 09. 2018	2402	39.285	1.757	38.912	1.715	0.95%	2.41%
		2412	39.268	1.766	38.859	1.723	1.04%	2.45%
		2437	39.223	1.788	38.847	1.746	0.96%	2.37%
		2441	39.216	1.792	38.820	1.749	1.01%	2.40%
		2450	39.200	1.800	38.828	1.756	0.95%	2.44%
		2462	39.185	1.813	38.785	1.770	1.02%	2.38%
		2480	39.162	1.827	38.782	1.782	0.97%	2.45%
	Nov, 10. 2018	2510	39.124	1.865	38.533	1.821	1.51%	2.38%
		2535	39.092	1.893	38.502	1.847	1.51%	2.42%
		2560	39.060	1.920	38.486	1.874	1.47%	2.40%
		2600	39.009	1.964	38.432	1.917	1.48%	2.38%
	Nov, 11. 2018	5180	36.009	4.635	35.112	4.493	2.49%	3.05%
		5200	35.986	4.655	35.101	4.509	2.46%	3.14%
		5220	35.963	4.676	35.057	4.528	2.52%	3.15%
		5240	35.940	4.696	35.059	4.550	2.45%	3.11%
	Nov, 12. 2018	5260	35.917	4.717	34.814	4.620	3.07%	2.05%
		5300	35.871	4.758	34.774	4.659	3.06%	2.07%
		5320	35.849	4.778	34.744	4.679	3.08%	2.07%
	Nov, 13. 2018	5500	35.643	4.963	35.454	5.010	0.53%	-0.96%
		5580	35.551	5.045	35.377	5.094	0.49%	-0.98%
		5600	35.529	5.065	35.365	5.117	0.46%	-1.03%
		5700	35.414	5.168	35.223	5.222	0.54%	-1.05%
	Nov, 14. 2018	5745	35.363	5.214	36.268	5.117	-2.56%	1.85%
		5785	35.317	5.255	36.218	5.160	-2.55%	1.80%
		5800	35.300	5.270	36.232	5.174	-2.64%	1.82%
		5825	35.271	5.296	36.174	5.201	-2.56%	1.79%

Tissue Type	Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev εr	% dev σ
Body	Nov, 15. 2018	824.2	55.242	0.969	56.596	0.986	-2.45%	-1.74%
		826.4	55.234	0.969	56.592	0.987	-2.46%	-1.82%
		829	55.223	0.970	56.593	0.988	-2.48%	-1.90%
		835	55.200	0.970	56.552	0.989	-2.45%	-1.96%
		836.5	55.195	0.972	56.586	0.990	-2.52%	-1.87%
		836.6	55.195	0.972	56.597	0.991	-2.54%	-1.96%
		844	55.172	0.981	56.541	0.999	-2.48%	-1.83%
		846.6	55.164	0.984	56.560	1.003	-2.53%	-1.90%
		848.8	55.158	0.987	56.542	1.005	-2.51%	-1.83%
	Nov, 16. 2018	1720	53.511	1.469	52.269	1.500	2.32%	-2.08%
		1732.5	53.478	1.477	52.269	1.509	2.26%	-2.14%
		1745	53.445	1.485	52.237	1.516	2.26%	-2.07%
		1750	53.432	1.488	52.224	1.520	2.26%	-2.12%
	Nov, 17. 2018	1850.2	53.300	1.520	52.826	1.549	0.89%	-1.91%
		1852.4	53.300	1.520	52.820	1.551	0.90%	-2.04%
		1860	53.300	1.520	52.826	1.552	0.89%	-2.11%
		1880	53.300	1.520	52.842	1.553	0.86%	-2.17%
		1900	53.300	1.520	52.842	1.554	0.86%	-2.24%
		1907.6	53.300	1.520	52.815	1.555	0.91%	-2.30%
		1909.8	53.300	1.520	52.804	1.556	0.93%	-2.37%
	Nov, 18. 2018	2402	52.764	1.904	51.102	1.951	3.15%	-2.46%
		2412	52.751	1.914	51.105	1.962	3.12%	-2.52%
		2437	52.717	1.938	51.078	1.986	3.11%	-2.50%
		2441	52.712	1.941	51.062	1.990	3.13%	-2.50%
		2450	52.700	1.950	51.087	2.001	3.06%	-2.62%
		2462	52.685	1.967	51.057	2.017	3.09%	-2.54%
		2480	52.662	1.993	51.008	2.042	3.14%	-2.48%
	Nov, 19. 2018	2510	52.624	2.035	53.476	2.090	-1.62%	-2.70%
		2535	52.592	2.071	53.449	2.125	-1.63%	-2.63%
		2560	52.560	2.106	53.417	2.162	-1.63%	-2.66%
		2600	52.509	2.163	53.375	2.221	-1.65%	-2.69%
	Nov, 20. 2018	5180	49.041	5.276	49.929	5.427	-1.81%	-2.86%
		5200	49.014	5.299	49.911	5.456	-1.83%	-2.96%
		5220	48.987	5.323	49.874	5.478	-1.81%	-2.92%
		5240	48.960	5.346	49.822	5.504	-1.76%	-2.96%
	Nov, 21. 2018	5260	48.933	5.369	49.814	5.525	-1.80%	-2.90%
		5300	48.879	5.416	49.768	5.573	-1.82%	-2.90%
		5320	48.851	5.439	49.721	5.599	-1.78%	-2.93%
	Nov, 22. 2018	5500	48.607	5.650	49.647	5.626	-2.14%	0.42%
		5580	48.499	5.743	49.507	5.718	-2.08%	0.44%
		5600	48.471	5.766	49.514	5.745	-2.15%	0.37%
		5700	48.336	5.883	49.351	5.862	-2.10%	0.36%
	Nov, 23. 2018	5745	48.275	5.936	49.264	5.912	-2.05%	0.40%
		5785	48.220	5.982	49.228	5.957	-2.09%	0.43%
		5800	48.200	6.000	49.207	5.979	-2.09%	0.35%
		5825	48.166	6.029	49.173	6.003	-2.09%	0.43%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

Frequency (MHz)	Mode	Ingredient						Total amount
		DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	
750	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)
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)
1750	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)
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	550 g	450 g	—	—	—	—	1.0L(Kg)
	Body	301.7 g	698.3 g	—	—	—	—	1.0L(Kg)
2600	Head	550 g	450 g	—	—	—	—	1.0L(Kg)
	Body	301.7 g	698.3 g	—	—	—	—	1.0L(Kg)

Simulating Liquids for 5 GHz, Manufactured by SPEAG:

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

Table 3. Recipes for tissue simulating liquid

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1.13 Test Standards and Limits

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

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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 W/kg	8.00 W/kg
Spatial Average SAR (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Table 4. RF exposure limits

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

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2. Summary of Results

GSM 850

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 (GSM)	Re Cheek	-	128	824.2	35	33.90	28.82%	0.253	0.326	-
	Re Tilt	-	128	824.2	35	33.90	28.82%	0.147	0.189	-
	Le Cheek	-	128	824.2	35	33.90	28.82%	0.331	0.426	90
	Le Cheek**	-	128	824.2	35	33.90	28.82%	0.321	0.414	-
	Le Cheek	-	190	836.6	35	33.88	29.42%	0.321	0.415	-
	Le Cheek	-	251	848.8	35	33.80	31.83%	0.318	0.419	-
	Le Tilt	-	128	824.2	35	33.90	28.82%	0.155	0.200	-
Body-worn (GSM)	Front side	10	128	824.2	35	33.90	28.82%	0.272	0.350	-
	Back side	10	128	824.2	35	33.90	28.82%	0.653	0.841	91
	Back side**	10	128	824.2	35	33.90	28.82%	0.618	0.796	-
	Back side	10	190	836.6	35	33.88	29.42%	0.487	0.630	-
	Back side	10	251	848.8	35	33.80	31.83%	0.541	0.713	-
Hotspot (GPRS) <1Dn2Up>	Front side	10	128	824.2	34	33.77	5.44%	0.482	0.508	-
	Back side	10	128	824.2	34	33.77	5.44%	1.170	1.234	-
	Back side	10	190	836.6	34	33.74	6.17%	1.270	1.348	-
	Back side	10	251	848.8	34	33.61	9.40%	1.300	1.422	92
	Back side*	10	251	848.8	34	33.61	9.40%	1.280	1.400	-
	Back side**	10	251	848.8	34	33.61	9.40%	1.190	1.302	-
	Bottom side	10	128	824.2	34	33.77	5.44%	0.199	0.210	-
	Right side	10	128	824.2	34	33.77	5.44%	0.185	0.195	-
	Left side	10	128	824.2	34	33.77	5.44%	0.226	0.238	-

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 10g (W/kg)		Plot page
								Measured	Reported	
Product specific 10g-SAR	Back side	0	128	824.2	34	33.77	5.44%	1.550	1.634	-
	Back side	0	190	836.6	34	33.74	6.17%	1.750	1.858	-
	Back side	0	251	848.8	34	33.61	9.40%	1.880	2.057	93
	Back side**	0	251	848.8	34	33.61	9.40%	1.730	1.893	-

* - repeated at the highest SAR measurement according to the KDB 865664 D01

** - 2nd Battery spotcheck

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GSM 1900

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 (GSM)	Re Cheek	-	512	1850.2	32	30.55	39.64%	0.225	0.314	94
	Re Cheek**	-	512	1850.2	32	30.55	39.64%	0.201	0.281	-
	Re Cheek	-	661	1880	32	30.42	43.88%	0.205	0.295	-
	Re Cheek	-	810	1909.8	32	30.25	49.62%	0.209	0.313	-
	Re Tilt	-	512	1850.2	32	30.55	39.64%	0.059	0.082	-
	Le Cheek	-	512	1850.2	32	30.55	39.64%	0.184	0.257	-
	Le Tilt	-	512	1850.2	32	30.55	39.64%	0.102	0.142	-
Body-worn (GSM)	Front side	10	512	1850.2	32	30.55	39.64%	0.212	0.296	-
	Back side	10	512	1850.2	32	30.55	39.64%	0.239	0.334	95
	Back side**	10	512	1850.2	32	30.55	39.64%	0.205	0.286	-
	Back side	10	661	1880	32	30.42	43.88%	0.222	0.319	-
	Back side	10	810	1909.8	32	30.25	49.62%	0.221	0.331	-
Hotspot (GPRS) <1Dn4Up>	Front side	10	512	1850.2	30.5	30.12	9.14%	0.491	0.536	-
	Back side	10	512	1850.2	30.5	30.12	9.14%	0.543	0.593	-
	Back side	10	661	1880	30.5	30.05	10.92%	0.515	0.571	-
	Back side	10	810	1909.8	30.5	29.88	15.35%	0.596	0.687	96
	Back side**	10	810	1909.8	30.5	29.88	15.35%	0.571	0.659	-
	Bottom side	10	512	1850.2	30.5	30.12	9.14%	0.242	0.264	-
	Right side	10	512	1850.2	30.5	30.12	9.14%	0.424	0.463	-
	Left side	10	512	1850.2	30.5	30.12	9.14%	0.099	0.108	-

** - 2nd Battery spotcheck

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WCDMA Band II

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	
R99 (Head)	RE Cheek	-	9262	1852.4	25	23.37	45.55%	0.479	0.697	97
	RE Cheek**	-	9262	1852.4	25	23.37	45.55%	0.455	0.662	-
	RE Cheek	-	9400	1880	25	22.89	62.55%	0.423	0.688	-
	RE Cheek	-	9538	1907.6	25	23.07	55.96%	0.443	0.691	-
	RE Tilt	-	9262	1852.4	25	23.37	45.55%	0.119	0.173	-
	LE Cheek	-	9262	1852.4	25	23.37	45.55%	0.344	0.501	-
	LE Tilt	-	9262	1852.4	25	23.37	45.55%	0.168	0.245	-
Body-worn	Front side	10	9262	1852.4	25	23.37	45.55%	0.316	0.460	-
	Back side	10	9262	1852.4	25	23.37	45.55%	0.349	0.508	-
Hotspot	Front side	10	9262	1852.4	25	23.37	45.55%	0.316	0.460	-
	Back side	10	9262	1852.4	25	23.37	45.55%	0.349	0.508	98
	Back side**	10	9262	1852.4	25	23.37	45.55%	0.331	0.482	-
	Back side	10	9400	1880	25	22.89	62.55%	0.312	0.507	-
	Back side	10	9538	1907.6	25	23.07	55.96%	0.309	0.482	-
	Bottom side	10	9262	1852.4	25	23.37	45.55%	0.156	0.227	-
	Right side	10	9262	1852.4	25	23.37	45.55%	0.273	0.397	-
	Left side	10	9262	1852.4	25	23.37	45.55%	0.064	0.093	-

** - 2nd Battery spotcheck

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WCDMA Band V

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	
R99 (Head)	RE Cheek	-	4132	826.4	25	23.67	35.83%	0.152	0.206	-
	RE Tilt	-	4132	826.4	25	23.67	35.83%	0.071	0.096	-
	LE Cheek	-	4132	826.4	25	23.67	35.83%	0.204	0.277	99
	LE Cheek**	-	4132	826.4	25	23.67	35.83%	0.166	0.225	-
	LE Cheek	-	4183	836.6	25	23.27	48.94%	0.168	0.250	-
	LE Cheek	-	4233	846.6	25	23.35	46.22%	0.174	0.254	-
	LE Tilt	-	4132	826.4	25	23.67	35.83%	0.074	0.101	-
Body-worn	Front side	10	4132	826.4	25	23.67	35.83%	0.162	0.220	-
	Back side	10	4132	826.4	25	23.67	35.83%	0.393	0.534	-
Hotspot	Front side	10	4132	826.4	25	23.67	35.83%	0.162	0.220	-
	Back side	10	4132	826.4	25	23.67	35.83%	0.393	0.534	100
	Back side**	10	4132	826.4	25	23.67	35.83%	0.368	0.500	-
	Back side	10	4183	836.6	25	23.27	48.94%	0.358	0.533	-
	Back side	10	4233	846.6	25	23.35	46.22%	0.344	0.503	-
	Bottom side	10	4132	826.4	25	23.67	35.83%	0.068	0.092	-
	Right side	10	4132	826.4	25	23.67	35.83%	0.061	0.083	-
	Left side	10	4132	826.4	25	23.67	35.83%	0.076	0.103	-

** - 2nd Battery spotcheck

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LTE FDD Band 2

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	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	20MHz	QPSK	1 RB	50	RE Cheek	-	18700	1860	25	23.09	55.24%	0.393	0.610	-
					RE Cheek	-	18900	1880	25	23.28	48.59%	0.412	0.612	-
					RE Cheek	-	19100	1900	25	23.42	43.88%	0.573	0.824	101
					RE Cheek**	-	19100	1900	25	23.42	43.88%	0.554	0.797	-
					RE Tilt	-	19100	1900	25	23.42	43.88%	0.145	0.209	-
					LE Cheek	-	19100	1900	25	23.42	43.88%	0.336	0.483	-
					LE Tilt	-	19100	1900	25	23.42	43.88%	0.156	0.224	-
			50 RB	0	RE Cheek	-	19100	1900	24	22.42	43.88%	0.521	0.750	-
					RE Tilt	-	19100	1900	24	22.42	43.88%	0.131	0.188	-
					LE Cheek	-	19100	1900	24	22.42	43.88%	0.316	0.455	-
					LE Tilt	-	19100	1900	24	22.42	43.88%	0.144	0.207	-
			100 RB		RE Cheek	-	18700	1860	24	22.21	51.01%	0.505	0.763	-
					RE Tilt	-	18700	1860	24	22.21	51.01%	0.101	0.153	-
					LE Cheek	-	18700	1860	24	22.21	51.01%	0.309	0.467	-
					LE Tilt	-	18700	1860	24	22.21	51.01%	0.128	0.193	-
Body-worn	20MHz	QPSK	1 RB	50	Front side	10	19100	1900	25	23.42	43.88%	0.267	0.384	-
					Back side	10	19100	1900	25	23.42	43.88%	0.295	0.424	-
Hotspot	20MHz	QPSK	1 RB	50	Front side	10	19100	1900	25	23.42	43.88%	0.267	0.384	-
					Back side	10	18700	1860	25	23.09	55.24%	0.267	0.414	-
					Back side	10	18900	1880	25	23.28	48.59%	0.284	0.422	-
					Back side	10	19100	1900	25	23.42	43.88%	0.295	0.424	102
					Back side**	10	19100	1900	25	23.42	43.88%	0.278	0.400	-
					Bottom side	10	19100	1900	25	23.42	43.88%	0.131	0.188	-
					Right side	10	19100	1900	25	23.42	43.88%	0.230	0.331	-
					Left side	10	19100	1900	25	23.42	43.88%	0.054	0.078	-
			50 RB	0	Front side	10	19100	1900	24	22.42	43.88%	0.221	0.318	-
					Back side	10	19100	1900	24	22.42	43.88%	0.243	0.350	-
					Bottom side	10	19100	1900	24	22.42	43.88%	0.107	0.154	-
					Right side	10	19100	1900	24	22.42	43.88%	0.191	0.275	-
					Left side	10	19100	1900	24	22.42	43.88%	0.045	0.065	-
			100 RB		Front side	10	19100	1900	24	22.38	45.21%	0.218	0.317	-
					Back side	10	19100	1900	24	22.38	45.21%	0.241	0.350	-
					Bottom side	10	19100	1900	24	22.38	45.21%	0.108	0.157	-
					Right side	10	19100	1900	24	22.38	45.21%	0.184	0.267	-
					Left side	10	19100	1900	24	22.38	45.21%	0.044	0.064	-

** - 2nd Battery spotcheck

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LTE FDD Band 4

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	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	20MHz	QPSK	1 RB	50	RE Cheek	-	20175	1732.5	24	22.86	30.02%	0.322	0.419	-
					RE Cheek	-	20300	1745	24	23.03	25.03%	0.349	0.436	103
					RE Cheek**	-	20300	1745	24	23.03	25.03%	0.322	0.403	-
					RE Tilt	-	20300	1745	24	23.03	25.03%	0.087	0.109	-
					LE Cheek	-	20300	1745	24	23.03	25.03%	0.249	0.311	-
					LE Tilt	-	20300	1745	24	23.03	25.03%	0.118	0.148	-
				99	RE Cheek	-	20050	1720	24	22.67	35.83%	0.318	0.432	-
			50 RB	0	RE Cheek	-	20300	1745	23	22.18	20.78%	0.331	0.400	-
					RE Tilt	-	20300	1745	23	22.18	20.78%	0.081	0.098	-
					LE Cheek	-	20300	1745	23	22.18	20.78%	0.238	0.287	-
					LE Tilt	-	20300	1745	23	22.18	20.78%	0.115	0.139	-
			100 RB		RE Cheek	-	20050	1720	23	22.05	24.45%	0.328	0.408	-
					RE Tilt	-	20050	1720	23	22.05	24.45%	0.081	0.101	-
					LE Cheek	-	20050	1720	23	22.05	24.45%	0.236	0.294	-
					LE Tilt	-	20050	1720	23	22.05	24.45%	0.115	0.143	-
Body-worn	20MHz	QPSK	1 RB	50	Front side	10	20300	1745	24	23.03	25.03%	0.349	0.436	-
					Back side	10	20300	1745	24	23.03	25.03%	0.435	0.544	-
Hotspot	20MHz	QPSK	1 RB	50	Front side	10	20300	1745	24	23.03	25.03%	0.349	0.436	-
					Back side	10	20175	1732.5	24	22.86	30.02%	0.418	0.543	-
					Back side	10	20300	1745	24	23.03	25.03%	0.435	0.544	104
					Back side**	10	20300	1745	24	23.03	25.03%	0.422	0.528	-
					Bottom side	10	20300	1745	24	23.03	25.03%	0.151	0.189	-
					Right side	10	20300	1745	24	23.03	25.03%	0.272	0.340	-
					Left side	10	20300	1745	24	23.03	25.03%	0.048	0.060	-
				99	Back side	10	20050	1720	24	22.67	35.83%	0.398	0.541	-
			50 RB	0	Front side	10	20300	1745	23	22.18	20.78%	0.243	0.293	-
					Back side	10	20300	1745	23	22.18	20.78%	0.303	0.366	-
					Bottom side	10	20300	1745	23	22.18	20.78%	0.105	0.127	-
					Right side	10	20300	1745	23	22.18	20.78%	0.189	0.228	-
					Left side	10	20300	1745	23	22.18	20.78%	0.034	0.041	-
			100 RB		Front side	10	20050	1720	23	22.05	24.45%	0.275	0.342	-
					Back side	10	20050	1720	23	22.05	24.45%	0.342	0.426	-
					Bottom side	10	20050	1720	23	22.05	24.45%	0.118	0.147	-
					Right side	10	20050	1720	23	22.05	24.45%	0.211	0.263	-
					Left side	10	20050	1720	23	22.05	24.45%	0.039	0.049	-

** - 2nd Battery spotcheck

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LTE FDD Band 5

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	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	10MHz	QPSK	1 RB	25	RE Cheek	-	20450	829	25	23.80	31.83%	0.183	0.241	-
					RE Tilt	-	20450	829	25	23.80	31.83%	0.105	0.138	-
					LE Cheek	-	20450	829	25	23.80	31.83%	0.235	0.310	105
					LE Cheek**	-	20450	829	25	23.80	31.83%	0.198	0.261	-
					LE Cheek	-	20525	836.5	25	23.77	32.74%	0.209	0.277	-
					LE Tilt	-	20450	829	25	23.80	31.83%	0.111	0.146	-
				49	LE Cheek	-	20600	844	25	23.57	39.00%	0.211	0.293	-
			25 RB	12	RE Cheek	-	20525	836.5	24	22.87	29.72%	0.166	0.215	-
					RE Tilt	-	20525	836.5	24	22.87	29.72%	0.092	0.119	-
					LE Cheek	-	20525	836.5	24	22.87	29.72%	0.221	0.287	-
					LE Tilt	-	20525	836.5	24	22.87	29.72%	0.105	0.136	-
			50 RB		RE Cheek	-	20450	829	24	22.69	35.21%	0.154	0.208	-
					RE Tilt	-	20450	829	24	22.69	35.21%	0.084	0.114	-
					LE Cheek	-	20450	829	24	22.69	35.21%	0.213	0.288	-
					LE Tilt	-	20450	829	24	22.69	35.21%	0.101	0.137	-
Body-worn	10MHz	QPSK	1 RB	25	Front side	10	20450	829	25	23.80	31.83%	0.172	0.227	-
					Back side	10	20450	829	25	23.80	31.83%	0.418	0.551	-
Hotspot	10MHz	QPSK	1 RB	25	Front side	10	20450	829	25	23.80	31.83%	0.172	0.227	-
					Back side	10	20450	829	25	23.80	31.83%	0.418	0.551	106
					Back side**	10	20450	829	25	23.80	31.83%	0.385	0.508	-
					Back side	10	20525	836.5	25	23.77	32.74%	0.401	0.532	-
					Bottom side	10	20450	829	25	23.80	31.83%	0.071	0.094	-
					Right side	10	20450	829	25	23.80	31.83%	0.066	0.087	-
					Left side	10	20450	829	25	23.80	31.83%	0.081	0.107	-
				49	Back side	10	20600	844	25	23.57	39.00%	0.384	0.534	-
			25 RB	12	Front side	10	20525	836.5	24	22.87	29.72%	0.166	0.215	-
					Back side	10	20525	836.5	24	22.87	29.72%	0.402	0.521	-
					Bottom side	10	20525	836.5	24	22.87	29.72%	0.068	0.088	-
					Right side	10	20525	836.5	24	22.87	29.72%	0.064	0.083	-
					Left side	10	20525	836.5	24	22.87	29.72%	0.078	0.101	-
			50 RB		Front side	10	20525	836.5	24	22.77	32.74%	0.169	0.224	-
					Back side	10	20525	836.5	24	22.77	32.74%	0.411	0.546	-
					Bottom side	10	20525	836.5	24	22.77	32.74%	0.071	0.094	-
					Right side	10	20525	836.5	24	22.77	32.74%	0.065	0.086	-
					Left side	10	20525	836.5	24	22.77	32.74%	0.079	0.105	-

** - 2nd Battery spotcheck

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LTE FDD Band 7

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	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	20MHz	QPSK	1 RB	0	RE Cheek	-	20850	2510	22	20.39	44.88%	0.818	1.185	-
				50	RE Cheek	-	21100	2535	22	20.37	45.55%	0.822	1.196	-
				99	RE Cheek	-	21350	2560	22	20.40	44.54%	0.837	1.210	-
					RE Tilt	-	21350	2560	22	20.40	44.54%	0.208	0.301	-
					LE Cheek	-	21350	2560	22	20.40	44.54%	0.602	0.870	-
					LE Tilt	-	21350	2560	22	20.40	44.54%	0.295	0.426	-
			50 RB	0	RE Cheek	-	20850	2510	22	20.35	46.22%	0.855	1.250	107
					RE Cheek*	-	20850	2510	22	20.35	46.22%	0.843	1.233	-
					RE Cheek**	-	20850	2510	22	20.35	46.22%	0.841	1.230	-
					RE Cheek	-	21100	2535	22	20.34	46.55%	0.843	1.235	-
					RE Cheek	-	21350	2560	22	20.33	46.89%	0.833	1.224	-
					RE Tilt	-	20850	2510	22	20.35	46.22%	0.222	0.325	-
					LE Cheek	-	20850	2510	22	20.35	46.22%	0.624	0.912	-
					LE Tilt	-	20850	2510	22	20.35	46.22%	0.301	0.440	-
			100 RB		RE Cheek	-	20850	2510	22	20.29	48.25%	0.831	1.232	-
					RE Cheek	-	21100	2535	22	20.26	49.28%	0.829	1.238	-
					RE Cheek	-	21350	2560	22	20.38	45.21%	0.804	1.167	-
					RE Tilt	-	20850	2510	22	20.29	48.25%	0.207	0.307	-
					LE Cheek	-	20850	2510	22	20.29	48.25%	0.598	0.887	-
					LE Tilt	-	20850	2510	22	20.29	48.25%	0.292	0.433	-
Body-worn	20MHz	QPSK	1 RB	0	Front side	10	20850	2510	22	20.41	44.21%	0.401	0.578	-
					Back side	10	20850	2510	22	20.41	44.21%	0.346	0.499	-
Hotspot	20MHz	QPSK	1 RB	0	Front side	10	20850	2510	22	20.41	44.21%	0.401	0.578	-
					Back side	10	20850	2510	22	20.41	44.21%	0.346	0.499	-
					Bottom side	10	20850	2510	22	20.41	44.21%	0.197	0.284	-
					Right side	10	20850	2510	22	20.41	44.21%	0.443	0.639	108
					Right side**	10	20850	2510	22	20.41	44.21%	0.422	0.609	-
					Left side	10	20850	2510	22	20.41	44.21%	0.081	0.117	-
				50	Right side	10	21100	2535	22	20.37	45.55%	0.421	0.613	-
				99	Right side	10	21350	2560	22	20.40	44.54%	0.431	0.623	-
			50 RB	0	Front side	10	20850	2510	22	20.35	46.22%	0.383	0.560	-
					Back side	10	20850	2510	22	20.35	46.22%	0.331	0.484	-
					Bottom side	10	20850	2510	22	20.35	46.22%	0.189	0.276	-
					Right side	10	20850	2510	22	20.35	46.22%	0.424	0.620	-
					Left side	10	20850	2510	22	20.35	46.22%	0.077	0.113	-
			100 RB		Front side	10	20850	2510	22	20.39	44.88%	0.377	0.546	-
					Back side	10	20850	2510	22	20.39	44.88%	0.326	0.472	-
					Bottom side	10	20850	2510	22	20.39	44.88%	0.186	0.269	-
					Right side	10	20850	2510	22	20.39	44.88%	0.417	0.604	-
					Left side	10	20850	2510	22	20.39	44.88%	0.076	0.110	-

* - repeated at the highest SAR measurement according to the KDB 865664 D01

** - 2nd Battery spotcheck

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WLAN 802.11b

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	-	11	2462	14.98	14.72	6.17%	0.049	0.052	-
	RE Tilt	-	11	2462	14.98	14.72	6.17%	0.043	0.046	-
	LE Cheek	-	11	2462	14.98	14.72	6.17%	0.147	0.156	109
	LE Cheek**	-	11	2462	14.98	14.72	6.17%	0.121	0.128	-
	LE Tilt	-	11	2462	14.98	14.72	6.17%	0.097	0.103	-
Body-worn	Front side	10	11	2462	14.98	14.72	6.17%	0.030	0.031	-
	Back side	10	11	2462	14.98	14.72	6.17%	0.108	0.115	-
Hotspot	Front side	10	11	2462	14.98	14.72	6.17%	0.030	0.031	-
	Back side	10	11	2462	14.98	14.72	6.17%	0.108	0.115	-
	Top side	10	11	2462	14.98	14.72	6.17%	0.032	0.034	-
	Right side	10	11	2462	14.98	14.72	6.17%	0.133	0.141	110
	Right side**	10	11	2462	14.98	14.72	6.17%	0.121	0.128	-
	Left side	10	11	2462	14.98	14.72	6.17%	0.006	0.006	-

** - 2nd Battery spotcheck

Bluetooth

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	-	39	2441	1.5	1.3	4.71%	0.005	0.005	-
	RE Tilt	-	39	2441	1.5	1.3	4.71%	0.004	0.005	-
	LE Cheek	-	39	2441	1.5	1.3	4.71%	0.023	0.024	111
	LE Cheek**	-	39	2441	1.5	1.3	4.71%	0.021	0.022	-
	LE Tilt	-	39	2441	1.5	1.3	4.71%	0.008	0.009	-
Body-worn	Front side	10	39	2441	1.5	1.3	4.71%	0.005	0.006	-
	Back side	10	39	2441	1.5	1.3	4.71%	0.020	0.021	112
	Back side**	10	39	2441	1.5	1.3	4.71%	0.011	0.012	-

** - 2nd Battery spotcheck

WLAN 802.11a 5.2G

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	-	48	5240	14.91	14.36	13.50%	0.067	0.076	-
	RE Tilt	-	48	5240	14.91	14.36	13.50%	0.076	0.086	-
	LE Cheek	-	48	5240	14.91	14.36	13.50%	0.088	0.100	-
	LE Tilt	-	48	5240	14.91	14.36	13.50%	0.089	0.101	113
	LE Tilt**	-	48	5240	14.91	14.36	13.50%	0.081	0.092	-
Body-worn	Front side	10	48	5240	14.91	14.15	19.12%	0.033	0.039	-
	Back side	10	48	5240	14.91	14.15	19.12%	0.165	0.197	114
	Back side**	10	48	5240	14.91	14.15	19.12%	0.142	0.169	-

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 10g (W/kg)		Plot page
								Measured	Reported	
Product specific 10g-SAR	Front side	0	48	5240	14.91	14.15	19.12%	0.111	0.132	-
	Back side	0	48	5240	14.91	14.15	19.12%	0.331	0.394	115
	Back side**	0	48	5240	14.91	14.15	19.12%	0.305	0.363	-
	Top side	0	48	5240	14.91	14.15	19.12%	0.062	0.074	-
	Right side	0	48	5240	14.91	14.15	19.12%	0.323	0.385	-
	Left side	0	48	5240	14.91	14.15	19.12%	0.032	0.038	-

** - 2nd Battery spotcheck

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WLAN 802.11a 5.3G

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	-	64	5320	14.85	14.84	0.23%	0.099	0.099	-
	RE Tilt	-	64	5320	14.85	14.84	0.23%	0.101	0.101	-
	LE Cheek	-	64	5320	14.85	14.84	0.23%	0.114	0.114	-
	LE Tilt	-	64	5320	14.85	14.84	0.23%	0.120	0.120	116
	LE Tilt**	-	64	5320	14.85	14.84	0.23%	0.102	0.102	-
Body-worn	Front side	10	64	5320	14.85	14.25	14.82%	0.041	0.047	-
	Back side	10	64	5320	14.85	14.25	14.82%	0.206	0.237	117
	Back side**	10	64	5320	14.85	14.25	14.82%	0.188	0.216	-

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 10g (W/kg)		Plot page
								Measured	Reported	
Product specific 10g-SAR	Front side	0	64	5320	14.85	14.25	14.82%	0.163	0.187	-
	Back side	0	64	5320	14.85	14.25	14.82%	0.412	0.473	118
	Back side**	0	64	5320	14.85	14.25	14.82%	0.398	0.457	-
	Top side	0	64	5320	14.85	14.25	14.82%	0.083	0.095	-
	Right side	0	64	5320	14.85	14.25	14.82%	0.401	0.460	-
	Left side	0	64	5320	14.85	14.25	14.82%	0.044	0.051	-

** - 2nd Battery spotcheck

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WLAN 802.11a 5.6G

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	-	100	5500	14.97	14.87	2.33%	0.095	0.097	-
	RE Tilt	-	100	5500	14.97	14.87	2.33%	0.098	0.100	-
	LE Cheek	-	100	5500	14.97	14.87	2.33%	0.111	0.114	-
	LE Tilt	-	100	5500	14.97	14.87	2.33%	0.113	0.116	119
	LE Tilt**	-	100	5500	14.97	14.87	2.33%	0.105	0.107	-
Body-worn	Front side	10	100	5500	14.97	14.28	17.22%	0.037	0.043	-
	Back side	10	100	5500	14.97	14.28	17.22%	0.186	0.218	120
	Back side**	10	100	5500	14.97	14.28	17.22%	0.163	0.191	-

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 10g (W/kg)		Plot page
								Measured	Reported	
Product specific 10g-SAR	Front side	0	100	5500	14.97	14.28	17.22%	0.155	0.182	-
	Back side	0	100	5500	14.97	14.28	17.22%	0.381	0.447	121
	Back side**	0	100	5500	14.97	14.28	17.22%	0.366	0.429	-
	Top side	0	100	5500	14.97	14.28	17.22%	0.077	0.090	-
	Right side	0	100	5500	14.97	14.28	17.22%	0.374	0.438	-
	Left side	0	100	5500	14.97	14.28	17.22%	0.038	0.045	-

** - 2nd Battery spotcheck

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WLAN 802.11a 5.8G

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	-	149	5745	14.97	14.85	2.80%	0.041	0.042	-
	RE Tilt	-	149	5745	14.97	14.85	2.80%	0.044	0.045	-
	LE Cheek	-	149	5745	14.97	14.85	2.80%	0.049	0.050	-
	LE Tilt	-	149	5745	14.97	14.85	2.80%	0.052	0.053	122
	LE Tilt**	-	149	5745	14.97	14.85	2.80%	0.044	0.045	-
Body-worn	Front side	10	149	5745	14.97	14.26	17.76%	0.027	0.032	-
	Back side	10	149	5745	14.97	14.26	17.76%	0.157	0.185	123
	Back side**	10	149	5745	14.97	14.26	17.76%	0.132	0.155	-

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 10g (W/kg)		Plot page
								Measured	Reported	
Product specific 10g-SAR	Front side	0	149	5745	14.97	14.26	17.76%	0.112	0.132	-
	Back side	0	149	5745	14.97	14.26	17.76%	0.303	0.357	124
	Back side**	0	149	5745	14.97	14.26	17.76%	0.284	0.334	-
	Top side	0	149	5745	14.97	14.26	17.76%	0.061	0.072	-
	Right side	0	149	5745	14.97	14.26	17.76%	0.298	0.351	-
	Left side	0	149	5745	14.97	14.26	17.76%	0.029	0.034	-

** - 2nd Battery spotcheck

Note:

$$\text{Scaling} = \frac{\text{reported SAR}}{\text{measured SAR}} = \frac{P2(mW)}{P1(mW)} = 10^{\left(\frac{P_2-P_1}{10}\right)(dBm)}$$

Reported SAR = measured SAR * (scaling)
Where P2 is maximum specified power, P1 is measured conducted power

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3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

Simultaneous Transmit Configurations	Head	Body-Worn	Hotspot	Product specific 10-g SAR
GSM + 2.4GHz Wi-Fi	Yes	Yes	No	No
GPRS + 2.4GHz Wi-Fi	No	No	Yes	No
WCDMA + 2.4GHz Wi-Fi	Yes	Yes	Yes	No
LTE + 2.4GHz Wi-Fi	Yes	Yes	Yes	No
GSM + 5GHz Wi-Fi	Yes	Yes	No	No
GPRS + 5GHz Wi-Fi	No	Yes	No	Yes
WCDMA + 5GHz Wi-Fi	Yes	Yes	No	No
LTE + 5GHz Wi-Fi	Yes	Yes	No	No
GSM + BT	Yes	Yes	No	No
GPRS + BT	No	Yes	No	No
WCDMA + BT	Yes	Yes	No	No
LTE + BT	Yes	Yes	No	No

Note:
1. The device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Based on KDB447498D01 note 36, when SAR test exclusion is allowed by other published RF exposure KDB procedures, such as the 2.5 cm hotspot mode SAR test exclusion for an edge or surface, then estimated SAR is not required to determine simultaneous SAR test exclusion.
3: Based on KDB 648474 D04v01r03 note 6, simultaneous transmission SAR for 10-g extremity SAR requires consideration only when standalone 10-g SAR is required.

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3.1 Estimated SAR calculation

According to KDB447498 D01v06 – When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

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

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

3.2 SPLSR evaluation and analysis

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

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

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

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

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

Simultaneous Transmission Combination

reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<1.6W/kg
GSM 850	Head	Right cheek	0.326	0.052	0.378
		Right tilt	0.189	0.046	0.235
		Left cheek	0.426	0.156	0.582
		Left tilt	0.200	0.103	0.303
GPRS 850 (1Dn2UP)	Hotspot	Front side	0.508	0.031	0.539
		Back side	1.422	0.115	1.537
		Top side	-	0.034	-
		Bottom side	0.210	-	-
		Right side	0.195	0.141	0.336
		Left side	0.238	0.006	0.244
GSM 1900	Head	Right cheek	0.314	0.052	0.366
		Right tilt	0.082	0.046	0.128
		Left cheek	0.257	0.156	0.413
		Left tilt	0.142	0.103	0.245
GPRS 1900 (1Dn4UP)	Hotspot	Front side	0.536	0.031	0.567
		Back side	0.687	0.115	0.802
		Top side	-	0.034	-
		Bottom side	0.264	-	-
		Right side	0.463	0.141	0.604
		Left side	0.108	0.006	0.114
WCDMA Band II	Head	Right cheek	0.697	0.052	0.749
		Right tilt	0.173	0.046	0.219
		Left cheek	0.501	0.156	0.657
		Left tilt	0.245	0.103	0.348
	Hotspot	Front side	0.460	0.031	0.491
		Back side	0.508	0.115	0.623
		Top side	-	0.034	-
		Bottom side	0.227	-	-
		Right side	0.397	0.141	0.538
		Left side	0.093	0.006	0.099

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reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<1.6W/kg
WCDMA Band V	Head	Right cheek	0.206	0.052	0.258
		Right tilt	0.096	0.046	0.142
		Left cheek	0.277	0.156	0.433
		Left tilt	0.101	0.103	0.204
	Hotspot	Front side	0.220	0.031	0.251
		Back side	0.534	0.115	0.649
		Top side	-	0.034	-
		Bottom side	0.092	-	-
		Right side	0.083	0.141	0.224
		Left side	0.103	0.006	0.109
LTE FDD Band 2	Head	Right cheek	0.824	0.052	0.876
		Right tilt	0.209	0.046	0.255
		Left cheek	0.483	0.156	0.639
		Left tilt	0.224	0.103	0.327
	Hotspot	Front side	0.384	0.031	0.415
		Back side	0.424	0.115	0.539
		Top side	-	0.034	-
		Bottom side	0.188	-	-
		Right side	0.331	0.141	0.472
		Left side	0.078	0.006	0.084
LTE FDD Band 4	Head	Right cheek	0.436	0.052	0.488
		Right tilt	0.109	0.046	0.155
		Left cheek	0.311	0.156	0.467
		Left tilt	0.148	0.103	0.251
	Hotspot	Front side	0.436	0.031	0.467
		Back side	0.544	0.115	0.659
		Top side	-	0.034	-
		Bottom side	0.189	-	-
		Right side	0.340	0.141	0.481
		Left side	0.060	0.006	0.066

reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<1.6W/kg
LTE FDD Band 5	Head	Right cheek	0.241	0.052	0.293
		Right tilt	0.138	0.046	0.184
		Left cheek	0.310	0.156	0.466
		Left tilt	0.146	0.103	0.249
	Hotspot	Front side	0.227	0.031	0.258
		Back side	0.551	0.115	0.666
		Top side	-	0.034	-
		Bottom side	0.094	-	-
		Right side	0.087	0.141	0.228
		Left side	0.107	0.006	0.113
LTE FDD Band 7	Head	Right cheek	1.250	0.052	1.302
		Right tilt	0.325	0.046	0.371
		Left cheek	0.912	0.156	1.068
		Left tilt	0.440	0.103	0.543
	Hotspot	Front side	0.578	0.031	0.609
		Back side	0.499	0.115	0.614
		Top side	-	0.034	-
		Bottom side	0.284	-	-
		Right side	0.639	0.141	0.780
		Left side	0.117	0.006	0.123

reported SAR WWAN and WLAN 5GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<4W/kg
GPRS 850 (1Dn2UP)	product specific 10g-SAR	Front side	-	0.187	-
		Back side	2.057	0.473	2.530
		Top side	-	0.095	-
		Bottom side	-	-	-
		Right side	-	0.460	-
		Left side	-	0.051	-

reported SAR WWAN and WLAN 5GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<1.6W/kg
GSM 850	body-worn	Front side	0.350	0.047	0.397
		Back side	0.841	0.237	1.078
GSM 1900	body-worn	Front side	0.296	0.047	0.343
		Back side	0.334	0.237	0.571
WCDMA Band II	body-worn	Front side	0.460	0.047	0.507
		Back side	0.508	0.237	0.745
WCDMA Band V	body-worn	Front side	0.220	0.047	0.267
		Back side	0.534	0.237	0.771
LTE FDD Band 2	body-worn	Front side	0.384	0.047	0.431
		Back side	0.424	0.237	0.661
LTE FDD Band 4	body-worn	Front side	0.436	0.047	0.483
		Back side	0.544	0.237	0.781
LTE FDD Band 5	body-worn	Front side	0.227	0.047	0.274
		Back side	0.551	0.237	0.788
LTE FDD Band 7	body-worn	Front side	0.578	0.047	0.625
		Back side	0.499	0.237	0.736

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reported SAR WWAN and WLAN 5GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<1.6W/kg
GSM 850	Head	Right cheek	0.326	0.099	0.425
		Right tilt	0.189	0.101	0.290
		Left cheek	0.426	0.114	0.540
		Left tilt	0.200	0.120	0.320
	body-worn	Front side	0.350	0.047	0.397
		Back side	0.841	0.237	1.078
GSM 1900	Head	Right cheek	0.314	0.099	0.413
		Right tilt	0.082	0.101	0.183
		Left cheek	0.257	0.114	0.371
		Left tilt	0.142	0.120	0.262
	body-worn	Front side	0.296	0.047	0.343
		Back side	0.334	0.237	0.571
WCDMA Band II	Head	Right cheek	0.697	0.099	0.796
		Right tilt	0.173	0.101	0.274
		Left cheek	0.501	0.114	0.615
		Left tilt	0.245	0.120	0.365
	body-worn	Front side	0.460	0.047	0.507
		Back side	0.508	0.237	0.745
WCDMA Band V	Head	Right cheek	0.206	0.099	0.305
		Right tilt	0.096	0.101	0.197
		Left cheek	0.277	0.114	0.391
		Left tilt	0.101	0.120	0.221
	body-worn	Front side	0.220	0.047	0.267
		Back side	0.534	0.237	0.771
LTE FDD Band 2	Head	Right cheek	0.824	0.099	0.923
		Right tilt	0.209	0.101	0.310
		Left cheek	0.483	0.114	0.597
		Left tilt	0.224	0.120	0.344
	body-worn	Front side	0.384	0.047	0.431
		Back side	0.424	0.237	0.661
LTE FDD Band 4	Head	Right cheek	0.436	0.099	0.535
		Right tilt	0.109	0.101	0.210
		Left cheek	0.311	0.114	0.425
		Left tilt	0.148	0.120	0.268
	body-worn	Front side	0.436	0.047	0.483
		Back side	0.544	0.237	0.781

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reported SAR WWAN and WLAN 5GHz, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	WLAN	<1.6W/kg
LTE FDD Band 5	Head	Right cheek	0.241	0.099	0.340
		Right tilt	0.138	0.101	0.239
		Left cheek	0.310	0.114	0.424
		Left tilt	0.146	0.120	0.266
	body-worn	Front side	0.227	0.047	0.274
		Back side	0.551	0.237	0.788
LTE FDD Band 7	Head	Right cheek	1.250	0.099	1.349
		Right tilt	0.325	0.101	0.426
		Left cheek	0.912	0.114	1.026
		Left tilt	0.440	0.120	0.560
	body-worn	Front side	0.578	0.047	0.625
		Back side	0.499	0.237	0.736

reported SAR WWAN and Bluetooth, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	BT	<1.6W/kg
GSM 850	Head	Right cheek	0.326	0.005	0.331
		Right tilt	0.189	0.005	0.194
		Left cheek	0.426	0.024	0.450
		Left tilt	0.200	0.009	0.209
	body-worn	Front side	0.350	0.006	0.356
		Back side	0.841	0.021	0.862
GSM 1900	Head	Right cheek	0.314	0.005	0.319
		Right tilt	0.082	0.005	0.087
		Left cheek	0.257	0.024	0.281
		Left tilt	0.142	0.009	0.151
	body-worn	Front side	0.296	0.006	0.302
		Back side	0.334	0.021	0.355
WCDMA Band II	Head	Right cheek	0.697	0.005	0.702
		Right tilt	0.173	0.005	0.178
		Left cheek	0.501	0.024	0.525
		Left tilt	0.245	0.009	0.254
	body-worn	Front side	0.460	0.006	0.466
		Back side	0.508	0.021	0.529
WCDMA Band V	Head	Right cheek	0.206	0.005	0.211
		Right tilt	0.096	0.005	0.101
		Left cheek	0.277	0.024	0.301
		Left tilt	0.101	0.009	0.110
	body-worn	Front side	0.220	0.006	0.226
		Back side	0.534	0.021	0.555
LTE FDD Band 2	Head	Right cheek	0.824	0.005	0.829
		Right tilt	0.209	0.005	0.214
		Left cheek	0.483	0.024	0.507
		Left tilt	0.224	0.009	0.233
	body-worn	Front side	0.384	0.006	0.390
		Back side	0.424	0.021	0.445
LTE FDD Band 4	Head	Right cheek	0.436	0.005	0.441
		Right tilt	0.109	0.005	0.114
		Left cheek	0.311	0.024	0.335
		Left tilt	0.148	0.009	0.157
	body-worn	Front side	0.436	0.006	0.442
		Back side	0.544	0.021	0.565

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reported SAR WWAN and Bluetooth, ΣSAR evaluation					
Frequency band	Position		reported SAR / W/kg		ΣSAR
			WWAN	BT	<1.6W/kg
LTE FDD Band 5	Head	Right cheek	0.241	0.005	0.246
		Right tilt	0.138	0.005	0.143
		Left cheek	0.310	0.024	0.334
		Left tilt	0.146	0.009	0.155
	body-worn	Front side	0.227	0.006	0.233
		Back side	0.551	0.021	0.572
LTE FDD Band 7	Head	Right cheek	1.250	0.005	1.255
		Right tilt	0.325	0.005	0.330
		Left cheek	0.912	0.024	0.936
		Left tilt	0.440	0.009	0.449
	body-worn	Front side	0.578	0.006	0.584
		Back side	0.499	0.021	0.520

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4. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	3938	Oct.24,2018	Oct.23,2019
SPEAG	System Validation Dipole	D835V2	4d120	Jun.18,2018	Jun.17,2019
		D1750V2	1023	Jun.11,2018	Jun.10,2019
		D1900V2	5d173	Apr.25,2018	Apr.25,2019
		D2450V2	727	Apr.24,2018	Apr.23,2019
		D2600V2	1005	Jan.17,2018	Jan.16,2019
		D5GHzV2	1023	Jan.25,2018	Jan.24,2019
SPEAG	Data acquisition Electronics	DAE4	1336	Aug.06,2018	Aug.05,2019
SPEAG	Software	DASY 52 V52.10.1	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	Agilent	E5071C	MY46107530	Feb.26,2018	Feb.25,2019
Agilent	Dielectric Probe Kit	85070E	MY44300677	Calibration not required	Calibration not required
Agilent	Dual-directional coupler	772D	MY52180142	Jul.04,2018	Jul.03,2019
		778D	MY52180302	Jul.05,2018	Jul.04,2019
Agilent	RF Signal Generator	N5181A	MY50144143	Mar.14,2018	Mar.13,2019
Agilent	Power Meter	E4417A	MY52240003	Dec.21,2017	Dec.20,2018
Agilent	Power Sensor	E9301H	MY52200003	Dec.21,2017	Dec.20,2018
			MY52200004	Dec.21,2017	Dec.20,2018
TECPEL	Digital thermometer	DTM-303A	TP130077	Mar.09,2018	Mar.08,2019
Anritsu	Radio Communication Test	MT8820C	6201061049	Apr.08,2018	Apr.07,2019

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5. Measurements

Date: 2018/11/6

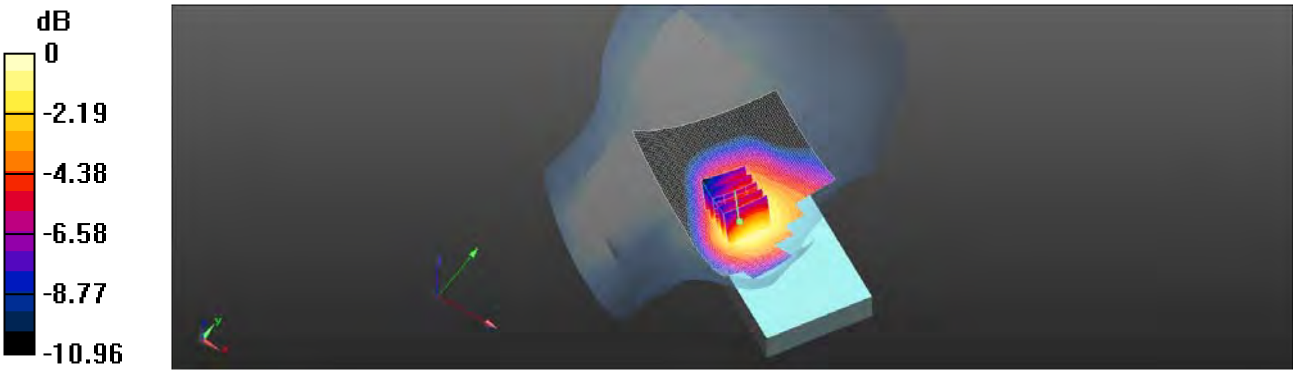
GSM 850_Head_Le Cheek_CH 128
Communication System: GSM; Frequency: 824.2 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 824.2 MHz; σ = 0.868 S/m; ε_r = 41.972; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.388 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.874 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.420 W/kg
SAR(1 g) = 0.331 W/kg; SAR(10 g) = 0.245 W/kg
Maximum value of SAR (measured) = 0.381 W/kg



0 dB = 0.381 W/kg = -4.19 dBW/kg

Date: 2018/11/15

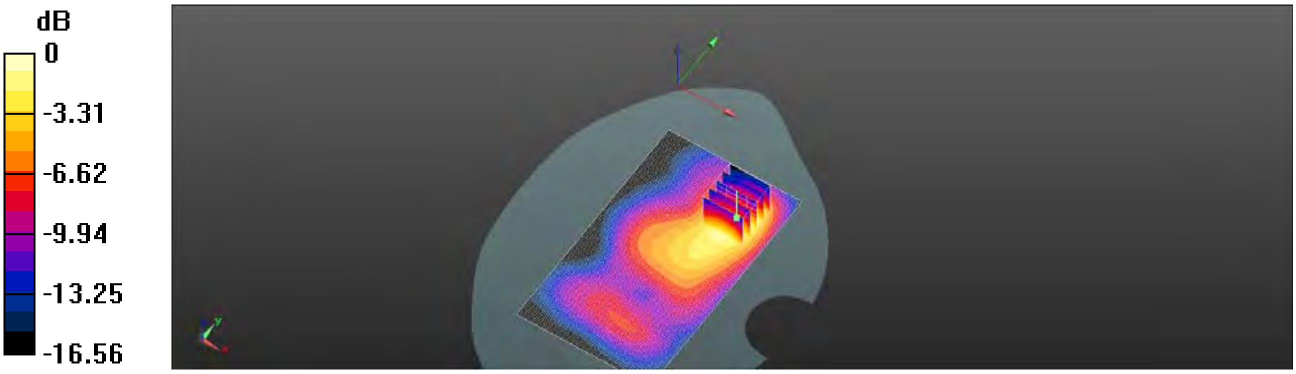
GSM 850_Body-worn_Back side_CH 128_10mm
Communication System: GSM; Frequency: 824.2 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 824.2 MHz; σ = 0.986 S/m; ε_r = 56.596; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.999 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.844 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.994 W/kg
SAR(1 g) = 0.653 W/kg; SAR(10 g) = 0.342 W/kg
Maximum value of SAR (measured) = 0.918 W/kg



0 dB = 0.918 W/kg = -1.03 dBW/kg

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Date: 2018/11/15

GPRS 850_Hotspot_Back side_CH 251_10mm
Communication System: GPRS (1Dn2Up); Frequency: 848.8 MHz; Duty Cycle: 1:4.10015
Medium parameters used: f = 849 MHz; σ = 1.005 S/m; ε_r = 56.542; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

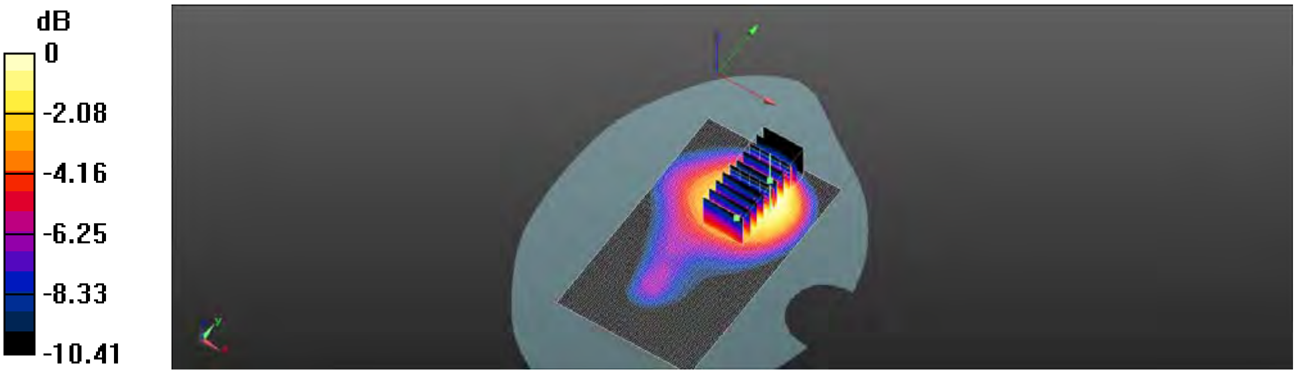
DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 1.71 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.52 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.33 W/kg
SAR(1 g) = 1.3 W/kg; SAR(10 g) = 0.831 W/kg
Maximum value of SAR (measured) = 1.78 W/kg

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.52 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.71 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.722 W/kg
Maximum value of SAR (measured) = 1.41 W/kg



0 dB = 1.78 W/kg = 2.52 dBW/kg

Date: 2018/11/15

GPRS 850_Product sprcific 10g_Back side_CH 251_0mm

Communication System: GPRS (1Dn2Up); Frequency: 848.8 MHz; Duty Cycle: 1:4.10015
Medium parameters used: f = 849 MHz; σ = 1.005 S/m; ε_r = 56.542; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

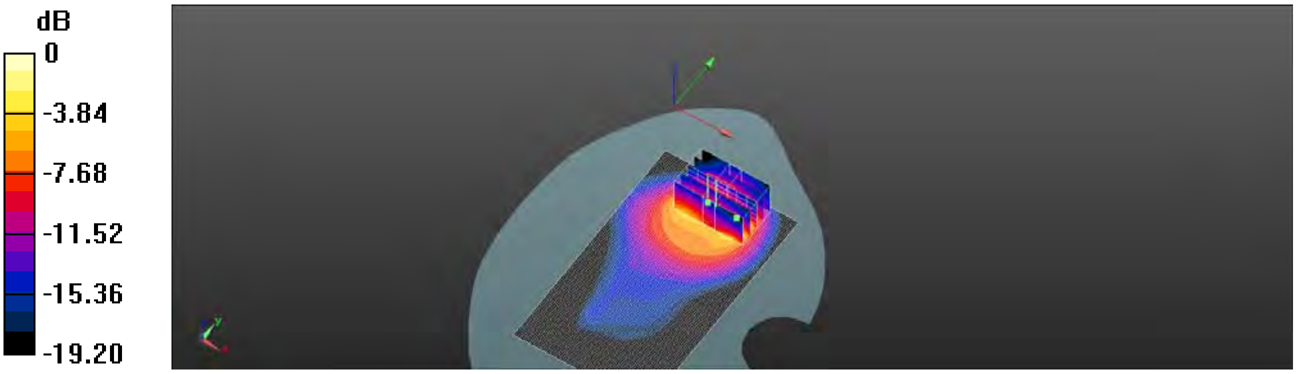
DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 4.67 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.64 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 9.68 W/kg
SAR(1 g) = 4.07 W/kg; SAR(10 g) = 1.88 W/kg
Maximum value of SAR (measured) = 6.27 W/kg

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.64 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 9.01 W/kg
SAR(1 g) = 3.49 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 6.00 W/kg



0 dB = 6.27 W/kg = 7.97 dBW/kg

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Date: 2018/11/8

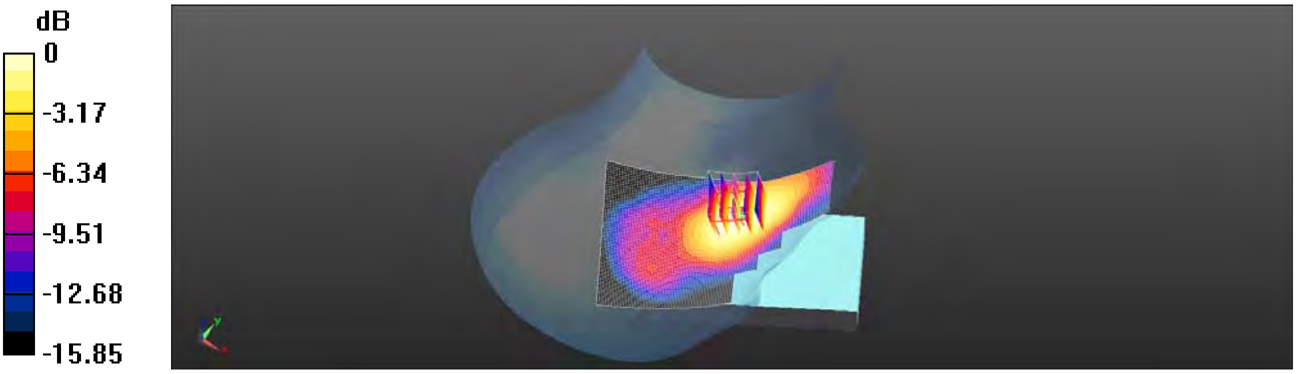
GSM 1900_Head_Re Cheek_CH 512
Communication System: GSM; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1850.2 MHz; σ = 1.353 S/m; ε_r = 41.208; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.282 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.988 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.328 W/kg
SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.143 W/kg
Maximum value of SAR (measured) = 0.280 W/kg



0 dB = 0.280 W/kg = -5.53 dBW/kg

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Date: 2018/11/17

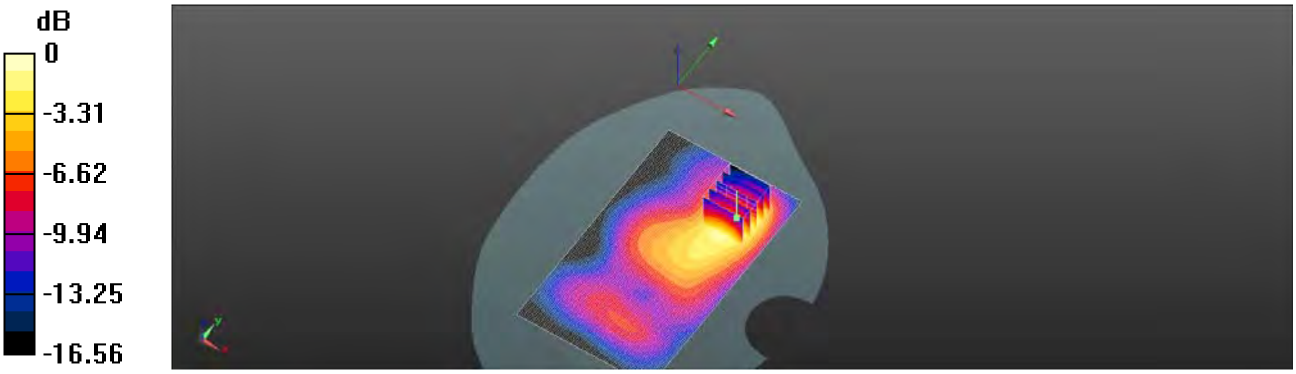
GSM 1900_Body-worn_Back side_CH 512_10mm
Communication System: GSM; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1850.2 MHz; σ = 1.549 S/m; ε_r = 52.826; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.329 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.948 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.384 W/kg
SAR(1 g) = 0.239 W/kg; SAR(10 g) = 0.139 W/kg
Maximum value of SAR (measured) = 0.314 W/kg



0 dB = 0.314 W/kg = -5.03 dBW/kg

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Date: 2018/11/17

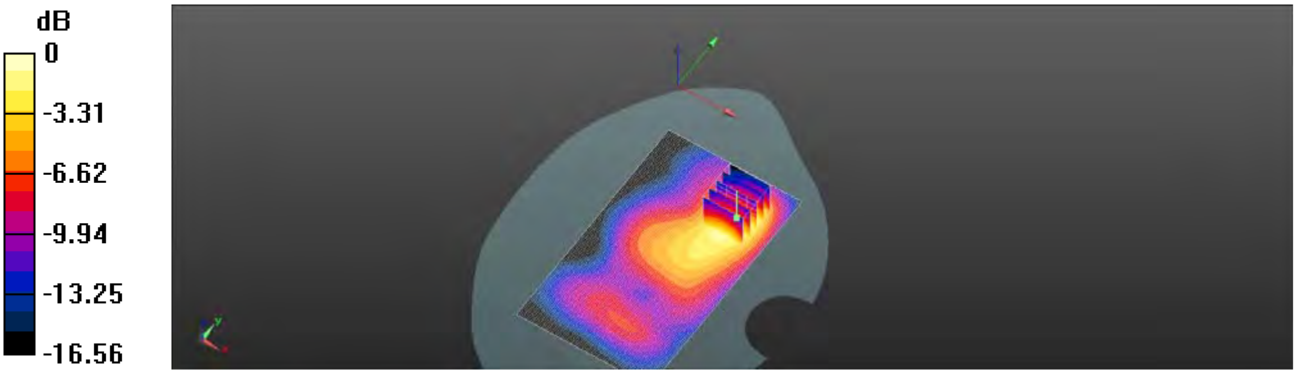
GSM 1900_Hotspot_Back side_CH 810_10mm
Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1909.8 MHz; σ = 1.556 S/m; ε_r = 52.804; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.648 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.050 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.771 W/kg
SAR(1 g) = 0.596 W/kg; SAR(10 g) = 0.271 W/kg
Maximum value of SAR (measured) = 0.622 W/kg



0 dB = 0.622 W/kg = -3.03 dBW/kg

Date: 2018/11/8

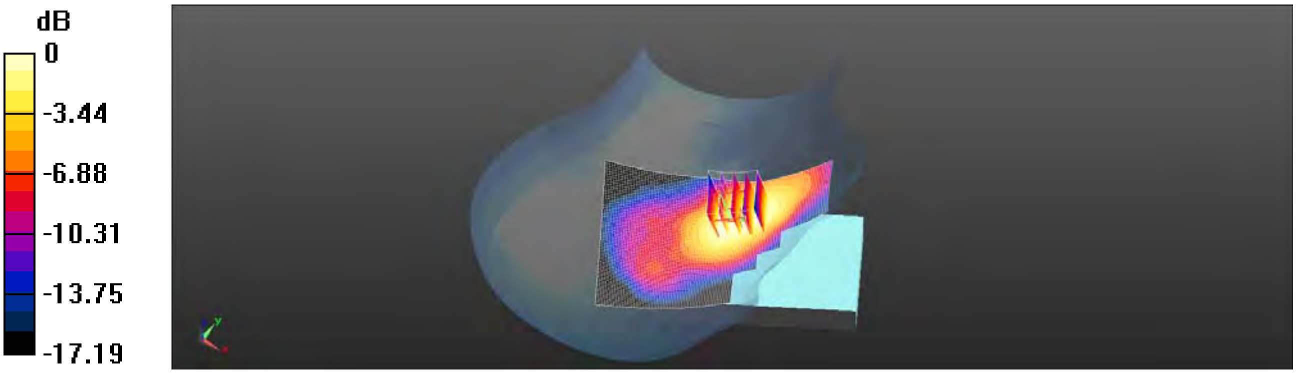
WCDMA Band II_Head_Re Cheek_CH 9262
Communication System: WCDMA; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1852.4 MHz; σ = 1.356 S/m; ε_r = 41.181; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.602 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.789 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.707 W/kg
SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.302 W/kg
Maximum value of SAR (measured) = 0.596 W/kg



0 dB = 0.596 W/kg = -2.25 dBW/kg

Date: 2018/11/17

WCDMA Band II_Hotspot_Back side_CH 9262_10mm

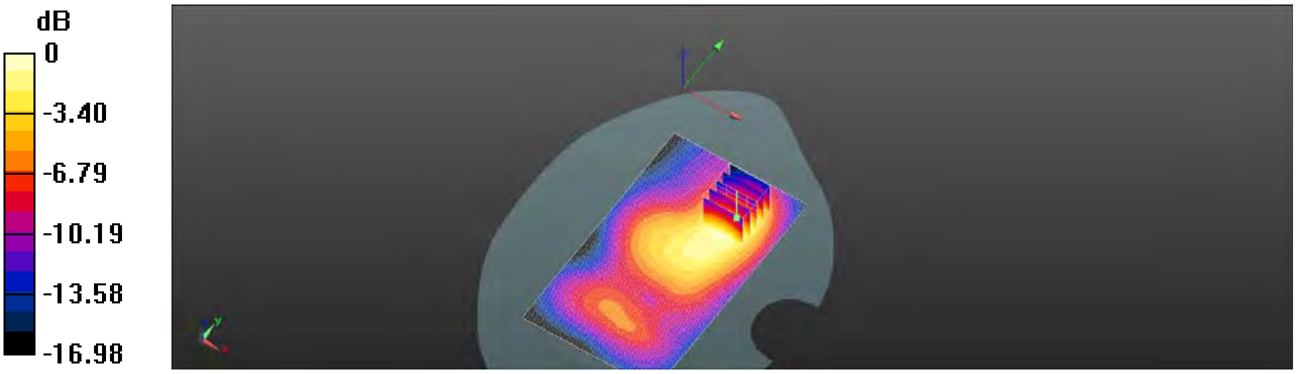
Communication System: WCDMA; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1852.4 MHz; σ = 1.551 S/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.489 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.29 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.545 W/kg
SAR(1 g) = 0.349 W/kg; SAR(10 g) = 0.210 W/kg
Maximum value of SAR (measured) = 0.456 W/kg



0 dB = 0.456 W/kg = -3.41 dBW/kg

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Date: 2018/11/6

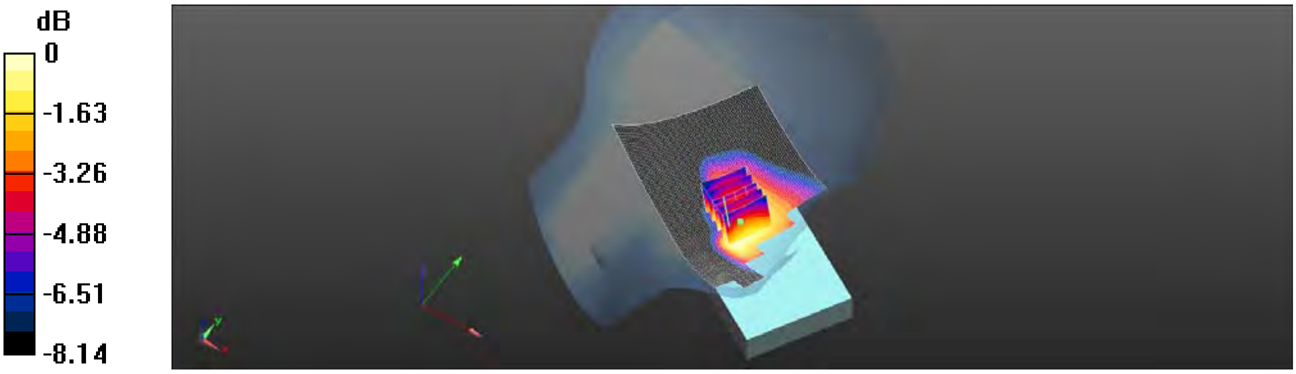
WCDMA Band V_Head_Le Cheek_CH 4132
Communication System: WCDMA; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium parameters used: f = 826.4 MHz; σ = 0.869 S/m; ε_r = 41.96; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.243 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.912 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.241 W/kg
SAR(1 g) = 0.204 W/kg; SAR(10 g) = 0.158 W/kg
Maximum value of SAR (measured) = 0.227 W/kg



0 dB = 0.227 W/kg = -6.44 dBW/kg

Date: 2018/11/15

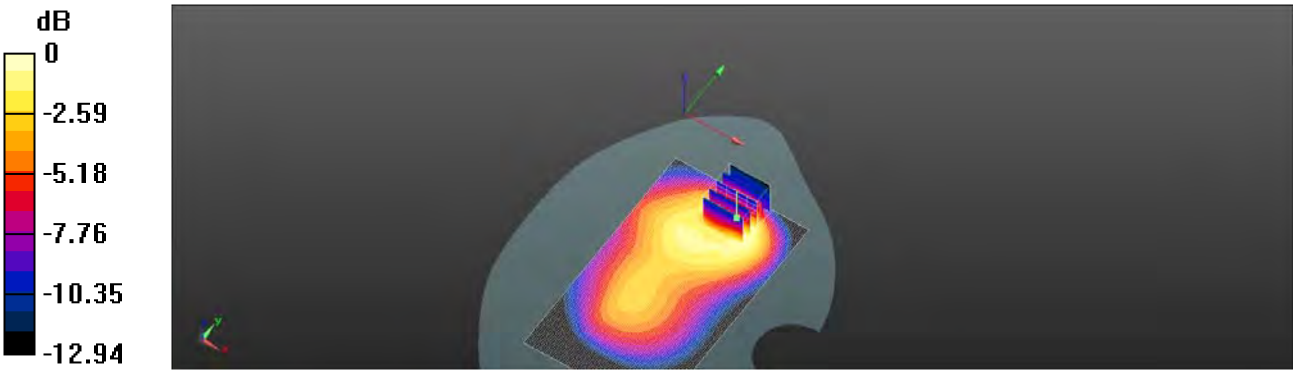
WCDMA Band V_Hotspot_Back side_CH 4132_10mm
Communication System: WCDMA; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium parameters used: f = 826.4 MHz; σ = 0.987 S/m; ε_r = 56.592; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.553 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.44 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.639 W/kg
SAR(1 g) = 0.393 W/kg; SAR(10 g) = 0.238 W/kg
Maximum value of SAR (measured) = 0.531 W/kg



0 dB = 0.531 W/kg = -2.75 dBW/kg

Date: 2018/11/8

LTE Band 2 (20MHz)_Head_Re Cheek_CH 19100_QPSK_1-50

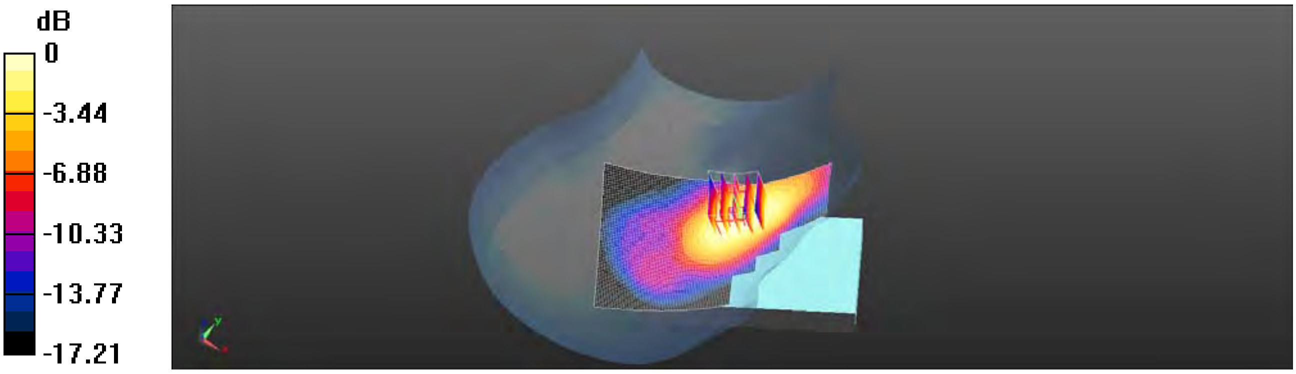
Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.358 S/m; ε_r = 41.22; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.724 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.063 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.858 W/kg
SAR(1 g) = 0.573 W/kg; SAR(10 g) = 0.361 W/kg
Maximum value of SAR (measured) = 0.733 W/kg



0 dB = 0.733 W/kg = -1.35 dBW/kg

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Date: 2018/11/17

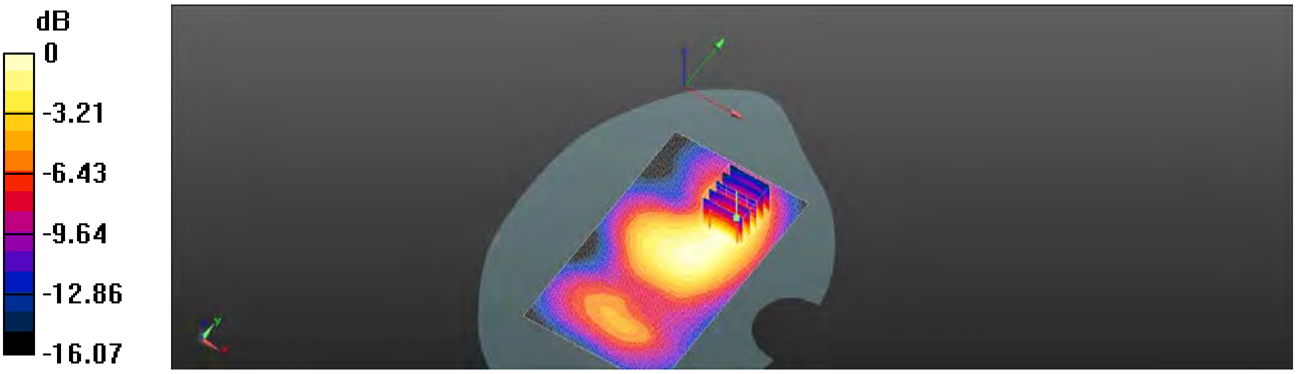
LTE Band 2 (20MHz)_Hotspot_Back side_CH 19100_QPSK_1-50_10mm
Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.554 S/m; ε_r = 52.842; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.406 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.34 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.463 W/kg
SAR(1 g) = 0.295 W/kg; SAR(10 g) = 0.179 W/kg
Maximum value of SAR (measured) = 0.387 W/kg



0 dB = 0.387 W/kg = -4.13 dBW/kg

Date: 2018/11/7

LTE Band 4 (20MHz)_Head_Re Cheek_CH 20300_QPSK_1-50

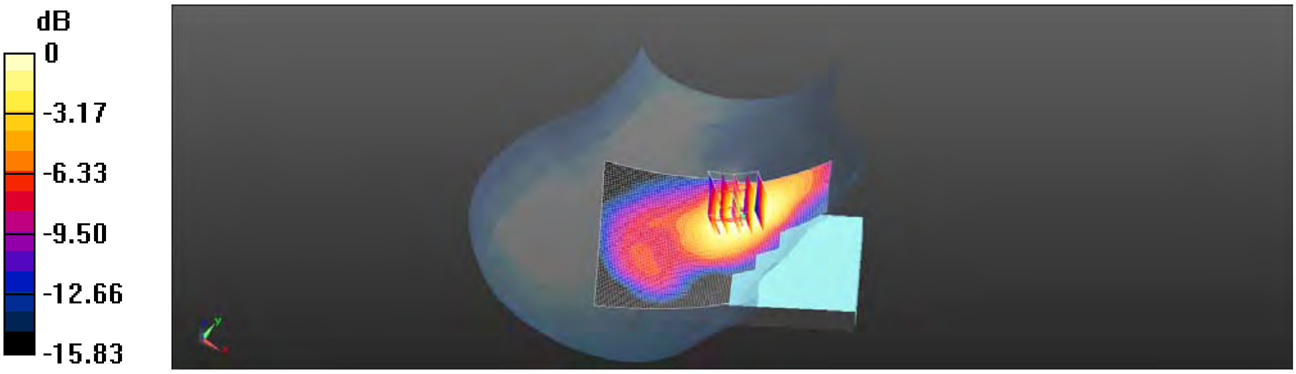
Communication System: LTE; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1745 MHz; σ = 1.327 S/m; ε_r = 40.897; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(8.32, 8.32, 8.32); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.435 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.493 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.494 W/kg
SAR(1 g) = 0.349 W/kg; SAR(10 g) = 0.228 W/kg
Maximum value of SAR (measured) = 0.426 W/kg



0 dB = 0.426 W/kg = -3.71 dBW/kg

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Date: 2018/11/16

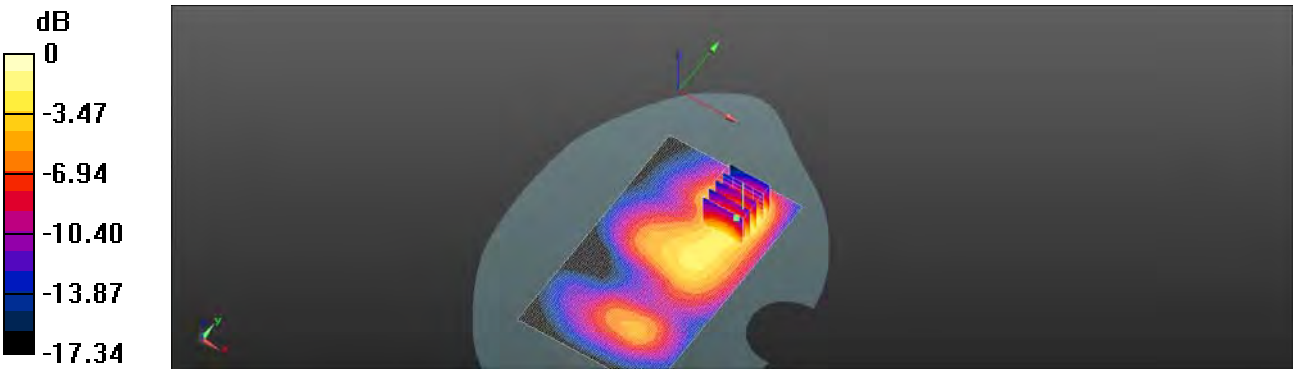
LTE Band 4 (20MHz)_Hotspot_Back side_CH 20300_QPSK_1-50_10mm
Communication System: LTE; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1745 MHz; σ = 1.516 S/m; ε_r = 52.237; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.83, 7.83, 7.83); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.569 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.26 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.724 W/kg
SAR(1 g) = 0.435 W/kg; SAR(10 g) = 0.241 W/kg
Maximum value of SAR (measured) = 0.555 W/kg



0 dB = 0.555 W/kg = -2.56 dBW/kg

Date: 2018/11/6

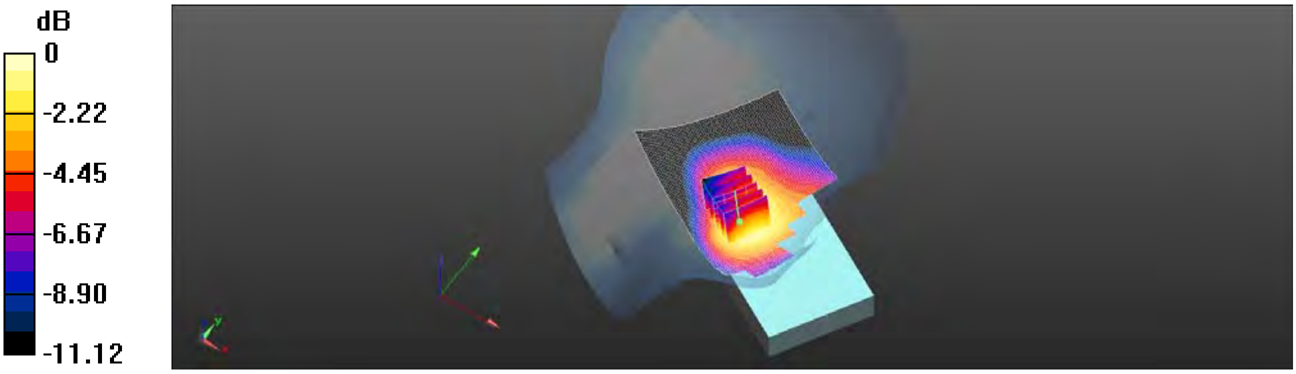
LTE Band 5 (10MHz)_Head_Le Cheek_CH 20450_QPSK_1-25
Communication System: LTE; Frequency: 829 MHz; Duty Cycle: 1:1
Medium parameters used: f = 829 MHz; σ = 0.871 S/m; ε_r = 41.926; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.279 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.886 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.303 W/kg
SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.175 W/kg
Maximum value of SAR (measured) = 0.272 W/kg



0 dB = 0.272 W/kg = -5.66 dBW/kg

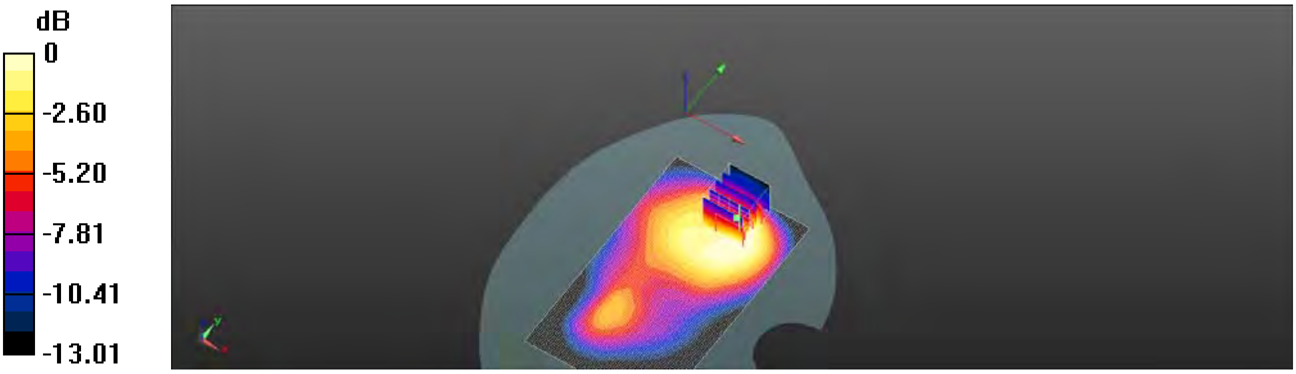
Date: 2018/11/15

LTE Band 5 (10HMz)_Hotspot_Back side_CH 20450_QPSK_1-25_10mm
Communication System: LTE; Frequency: 829 MHz; Duty Cycle: 1:1
Medium parameters used: f = 829 MHz; σ = 0.988 S/m; ε_r = 56.593; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:
- Probe: EX3DV4 – SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.570 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.98 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.662 W/kg
SAR(1 g) = 0.418 W/kg; SAR(10 g) = 0.261 W/kg
Maximum value of SAR (measured) = 0.533 W/kg



0 dB = 0.533 W/kg = -2.73 dBW/kg

Date: 2018/11/10

LTE Band 7 (20MHz)_Head_Re Cheek_CH 20850_QPSK_50-0

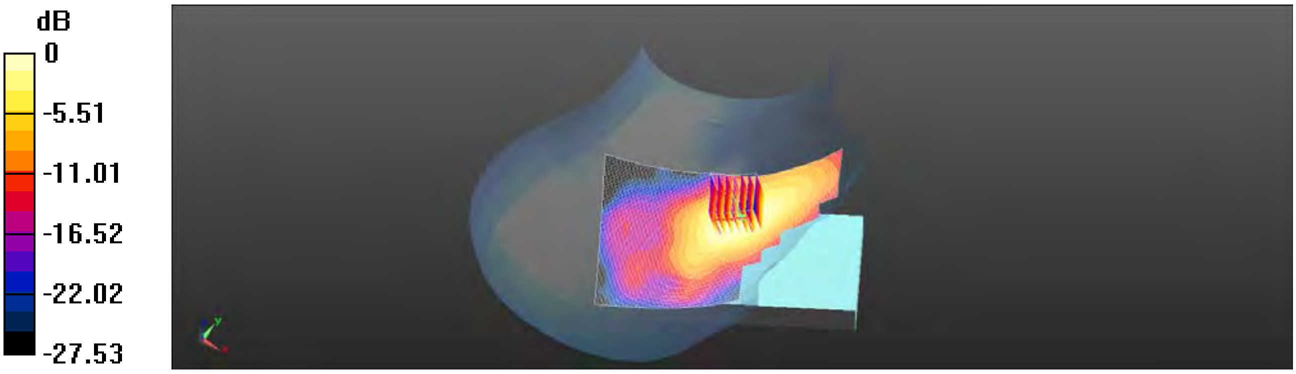
Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 1.821 S/m; ε_r = 38.533; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.11, 7.11, 7.11); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 1.22 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.019 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.855 W/kg; SAR(10 g) = 0.449 W/kg
Maximum value of SAR (measured) = 1.22 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

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Date: 2018/11/19

LTE Band 7 (20MHz)_Hotspot_Right side_CH 20850_QPSK_1-0_10mm

Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 2.09 S/m; ε_r = 53.476; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.7°C; Liquid temperature: 21.8°C

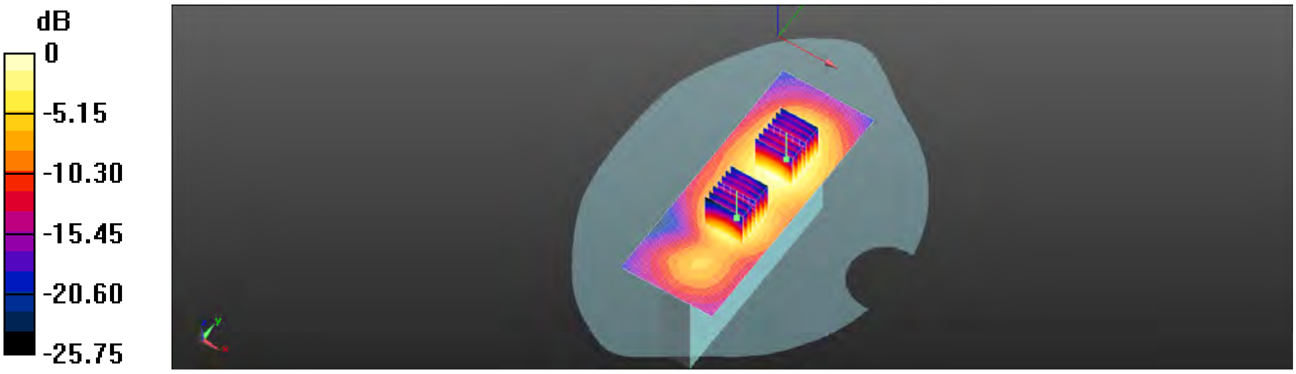
DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.15, 7.15, 7.15); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x161x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.665 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.20 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.833 W/kg
SAR(1 g) = 0.443 W/kg; SAR(10 g) = 0.236 W/kg
Maximum value of SAR (measured) = 0.632 W/kg

Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.20 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.754 W/kg
SAR(1 g) = 0.401 W/kg; SAR(10 g) = 0.202 W/kg
Maximum value of SAR (measured) = 0.576 W/kg



0 dB = 0.632 W/kg = -2.00 dBW/kg

Date: 2018/11/9

WLAN 802.11b_Head_Le Cheek_CH 11

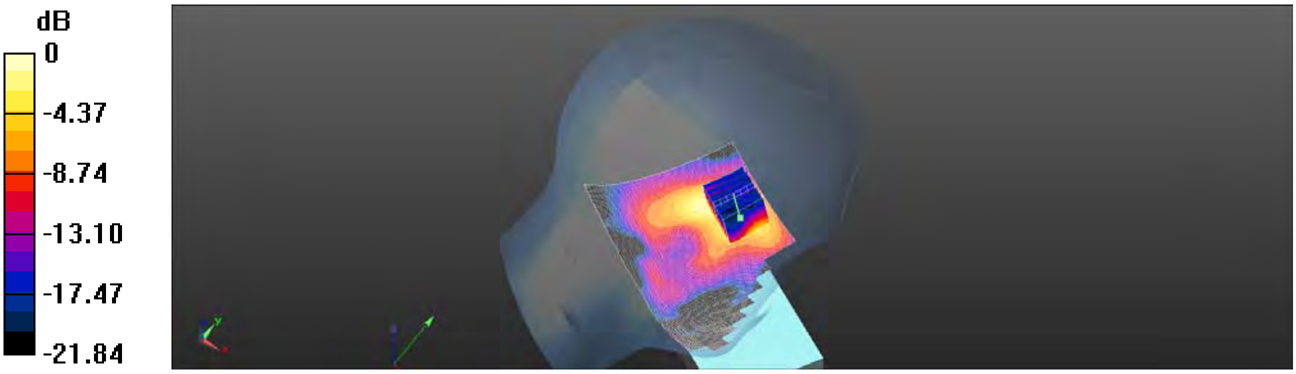
Communication System: WLAN 2.45G; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.77 S/m; ε_r = 38.785; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.187 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.041 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.364 W/kg
SAR(1 g) = 0.147 W/kg; SAR(10 g) = 0.063 W/kg
Maximum value of SAR (measured) = 0.248 W/kg



0 dB = 0.248 W/kg = -6.06 dBW/kg

Date: 2018/11/18

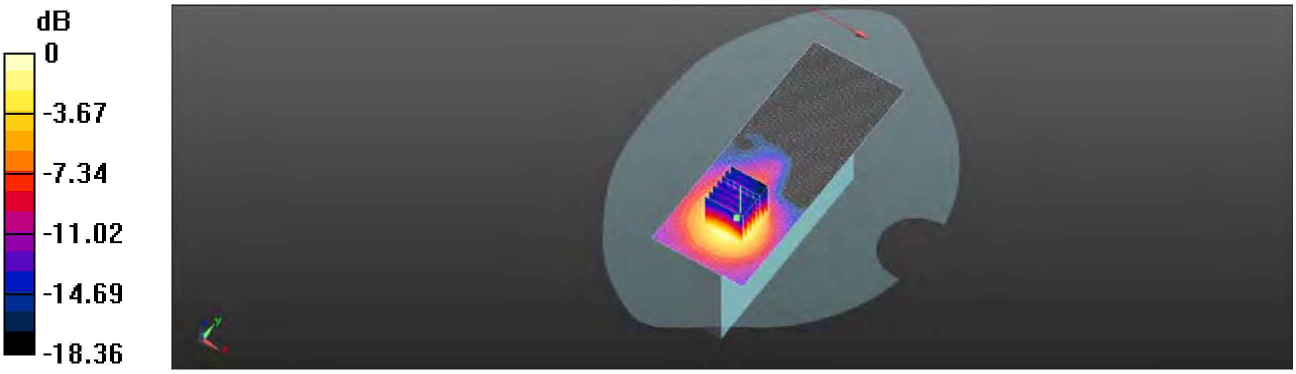
WLAN 802.11b_Hotspot_Right side_CH 11_10mm
Communication System: WLAN 2.45G; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 2.017 S/m; ε_r = 51.057; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x161x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.192 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.724 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.133 W/kg; SAR(10 g) = 0.072 W/kg
Maximum value of SAR (measured) = 0.188 W/kg



0 dB = 0.188 W/kg = -7.25 dBW/kg

Date: 2018/11/9

Bluetooth(GFSK)_Head_Le Cheek_CH 39

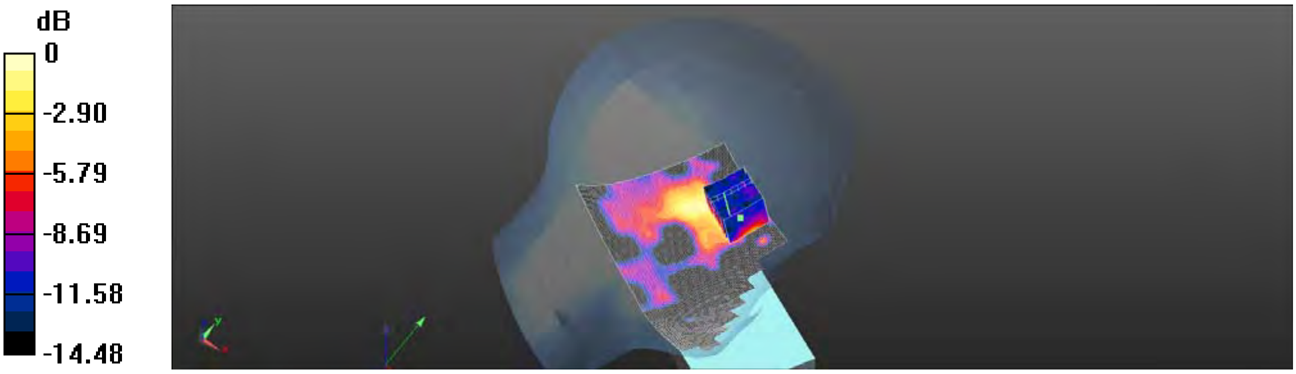
Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; σ = 1.749 S/m; ε_r = 38.82; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0435 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.509 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.0750 W/kg
SAR(1 g) = 0.023 W/kg; SAR(10 g) = 0.010 W/kg
Maximum value of SAR (measured) = 0.0362 W/kg



0 dB = 0.0362 W/kg = -14.41 dBW/kg

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Date: 2018/11/18

Bluetooth(GFSK)_Body-worn_Back side_CH 39_10mm

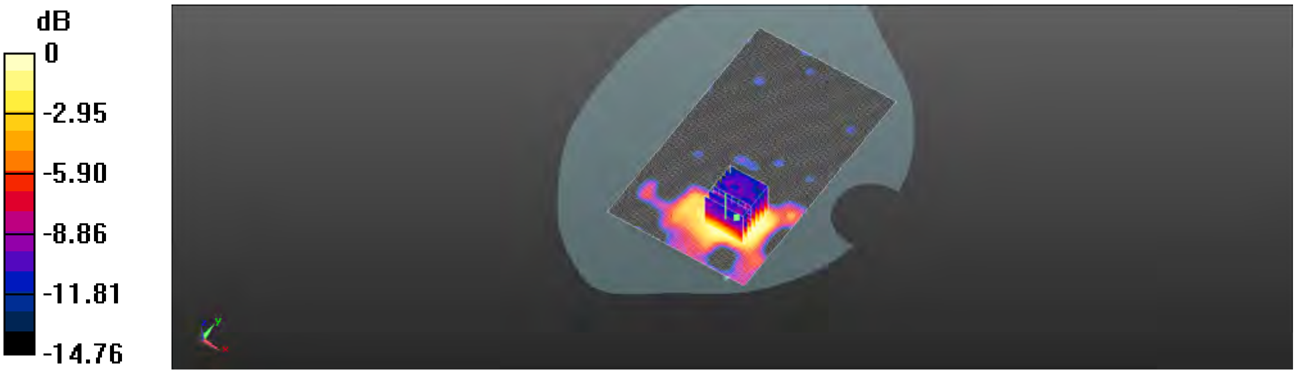
Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; σ = 1.99 S/m; ε_r = 51.062; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0286 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.117 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.0380 W/kg
SAR(1 g) = 0.020 W/kg; SAR(10 g) = 0.011 W/kg
Maximum value of SAR (measured) = 0.0281 W/kg



0 dB = 0.0281 W/kg = -15.51 dBW/kg

Date: 2018/11/11

WLAN 802.11a 5.2G_Head_Le Tilt_CH 48

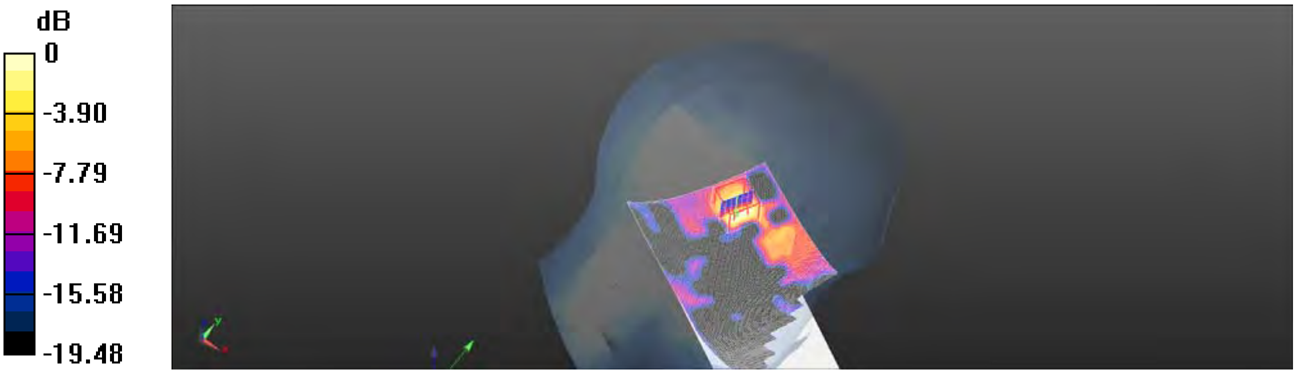
Communication System: WLAN 5G; Frequency: 5240 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5240 MHz; σ = 4.55 S/m; ε_r = 35.059; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.7°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.257 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.498 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.310 W/kg
SAR(1 g) = 0.089 W/kg; SAR(10 g) = 0.029 W/kg
Maximum value of SAR (measured) = 0.179 W/kg



0 dB = 0.179 W/kg = -7.48 dBW/kg

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Date: 2018/11/20

WLAN 802.11a 5.2G_Body-worn_Back side_CH 48_10mm

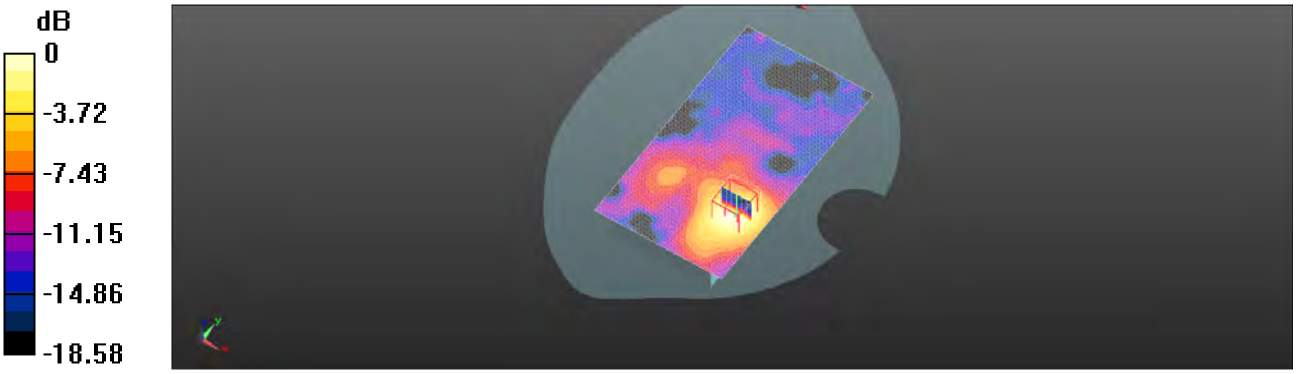
Communication System: WLAN 5G; Frequency: 5240 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5240 MHz; σ = 5.504 S/m; ε_r = 49.822; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.312 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.355 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.568 W/kg
SAR(1 g) = 0.165 W/kg; SAR(10 g) = 0.066 W/kg
Maximum value of SAR (measured) = 0.294 W/kg



0 dB = 0.294 W/kg = -5.32 dBW/kg

Date: 2018/11/20

WLAN 802.11a 5.2G_ Product sprcific 10g _Back side_CH 48_0mm

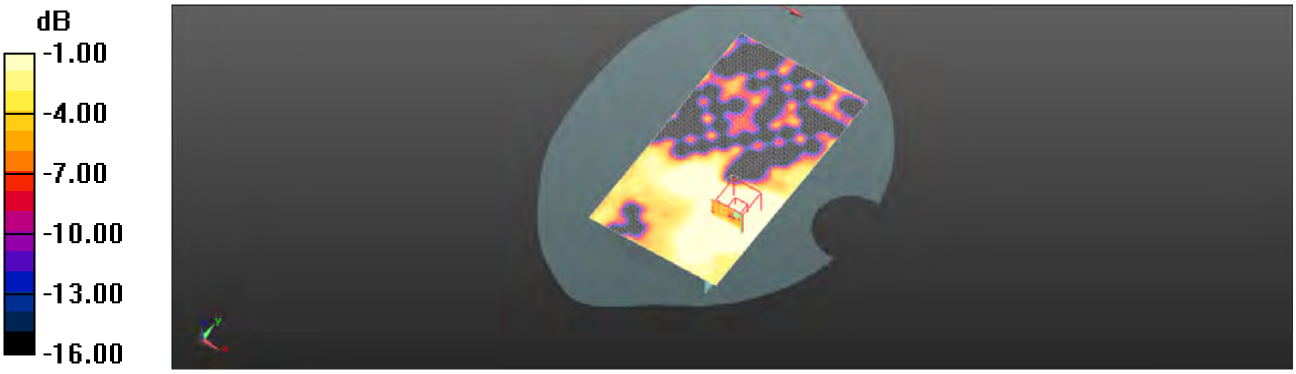
Communication System: WLAN 5G; Frequency: 5240 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5240 MHz; σ = 5.504 S/m; ε_r = 49.822; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 1.56 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.770 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 2.84 W/kg
SAR(1 g) = 0.827 W/kg; SAR(10 g) = 0.331 W/kg
Maximum value of SAR (measured) = 1.47 W/kg



0 dB = 1.47 W/kg = -1.81 dBW/kg

Date: 2018/11/12

WLAN 802.11a 5.3G_Head_Le Tilt_CH 64

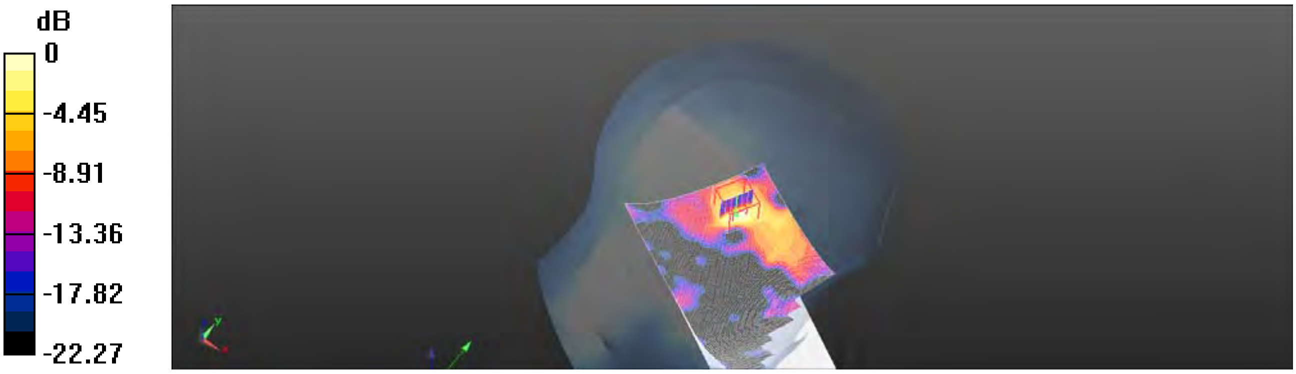
Communication System: WLAN 5G; Frequency: 5320 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5320 MHz; σ = 4.679 S/m; ε_r = 34.744; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.252 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.240 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.423 W/kg
SAR(1 g) = 0.120 W/kg; SAR(10 g) = 0.038 W/kg
Maximum value of SAR (measured) = 0.244 W/kg



0 dB = 0.244 W/kg = -6.13 dBW/kg

Date: 2018/11/21

WLAN 802.11a 5.3G_Body-worn_Back side_CH 64_10mm

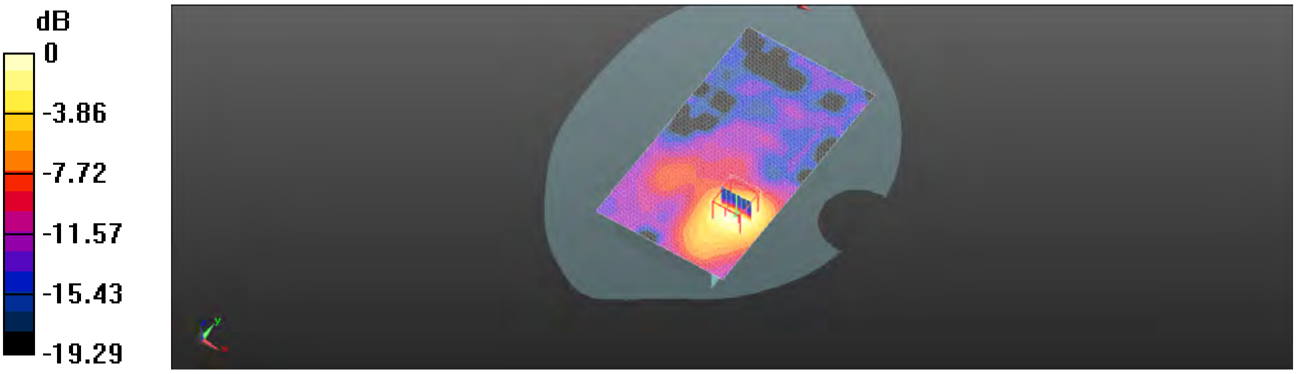
Communication System: WLAN 5G; Frequency: 5320 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5320 MHz; σ = 5.599 S/m; ε_r = 49.721; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.9°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.10(7373)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.382 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.330 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.741 W/kg
SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.082 W/kg
Maximum value of SAR (measured) = 0.370 W/kg



0 dB = 0.370 W/kg = -4.32 dBW/kg

Date: 2018/11/21

WLAN 802.11a 5.3G_ Product sprcific 10g _Back side_CH 64_0mm

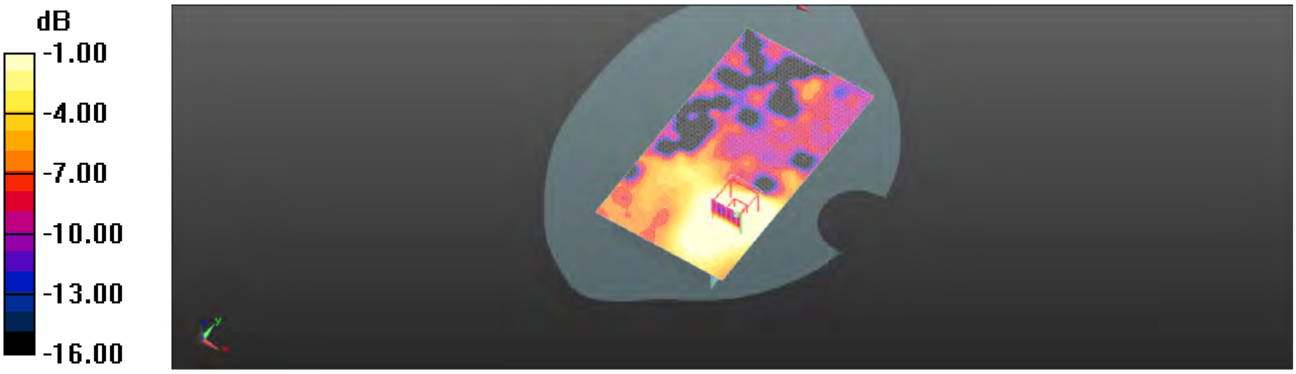
Communication System: WLAN 5G; Frequency: 5320 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5320 MHz; σ = 5.599 S/m; ε_r = 49.721; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.9°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.10(7373)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 1.52 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.880 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.54 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.412 W/kg
Maximum value of SAR (measured) = 1.57 W/kg



0 dB = 1.57 W/kg = 2.02 dBW/kg

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Date: 2018/11/13

WLAN 802.11a 5.6G_Head_Le Tilt_CH 100

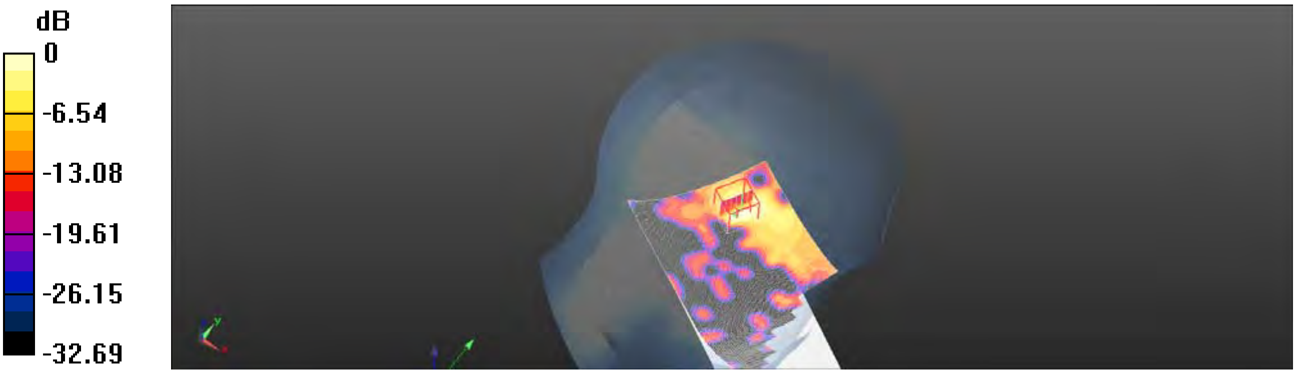
Communication System: WLAN 5G; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.01 S/m; ε_r = 35.454; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.65, 4.65, 4.65); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.274 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.096 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.408 W/kg
SAR(1 g) = 0.113 W/kg; SAR(10 g) = 0.033 W/kg
Maximum value of SAR (measured) = 0.228 W/kg



0 dB = 0.228 W/kg = -6.42 dBW/kg

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Date: 2018/11/22

WLAN 802.11a 5.6G_Body-worn_Back side_CH 100_10mm

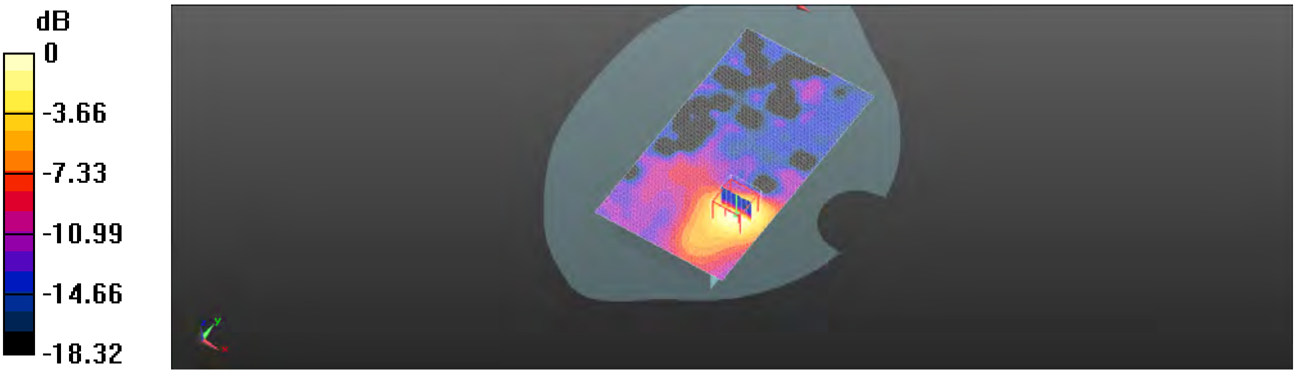
Communication System: WLAN 5G; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.626 S/m; ε_r = 49.647; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.1°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(3.77, 3.77, 3.77); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.10(7373)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.338 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.768 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.649 W/kg
SAR(1 g) = 0.186 W/kg; SAR(10 g) = 0.073 W/kg
Maximum value of SAR (measured) = 0.336 W/kg



0 dB = 0.336 W/kg = -4.74 dBW/kg

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Date: 2018/11/22

WLAN 802.11a 5.6G_ Product sprcific 10g _Back side_CH 100_0mm

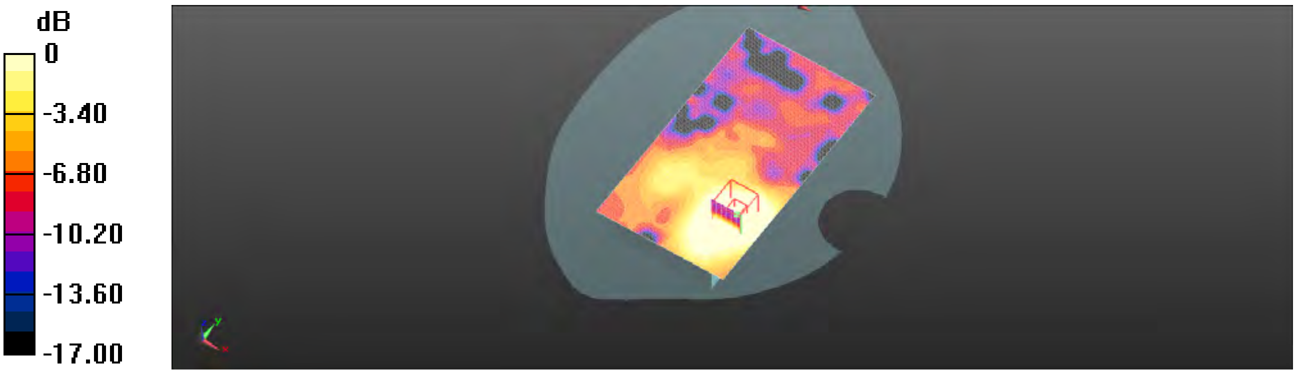
Communication System: WLAN 5G; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.626 S/m; ε_r = 49.647; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.1°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(3.77, 3.77, 3.77); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.10(7373)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 1.69 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.933 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 0.962 W/kg; SAR(10 g) = 0.381 W/kg
Maximum value of SAR (measured) = 1.68 W/kg



0 dB = 1.68 W/kg = 2.85 dBW/kg

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Date: 2018/11/14

WLAN 802.11a 5.8G_Head_Le Tilt_CH 149

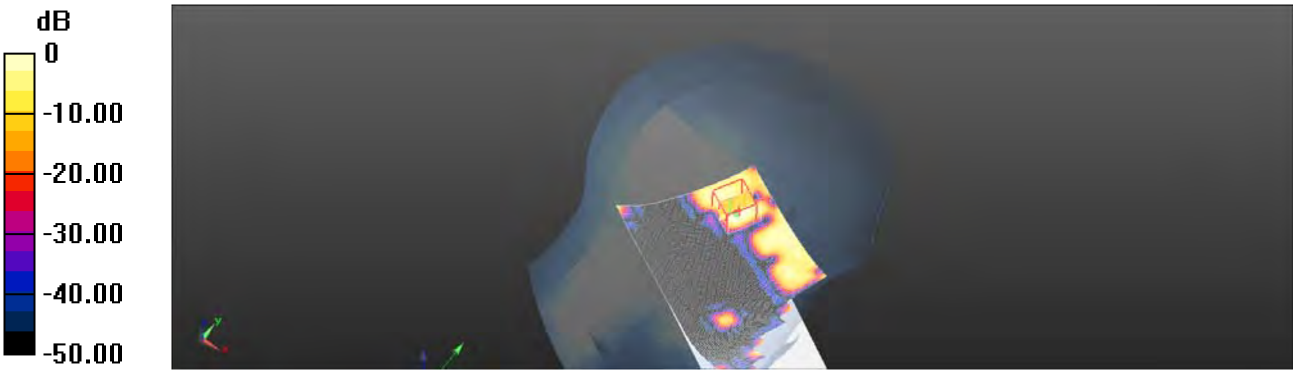
Communication System: WLAN 5G; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5745 MHz; σ = 5.117 S/m; ε_r = 36.268; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.76, 4.76, 4.76); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.283 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.9840 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.206 W/kg
SAR(1 g) = 0.052 W/kg; SAR(10 g) = 0.016 W/kg
Maximum value of SAR (measured) = 0.106 W/kg



0 dB = 0.106 W/kg = -9.77 dBW/kg

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Date: 2018/11/23

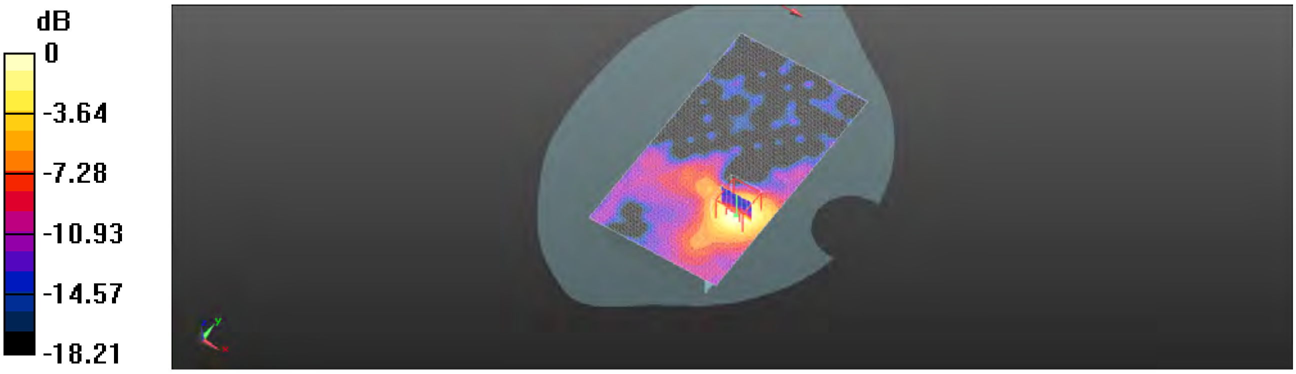
WLAN 802.11a 5.8G_Body-worn_Back side_CH 149_10mm
Communication System: WLAN 5G; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5745 MHz; σ = 5.912 S/m; ε_r = 49.264; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4, 4, 4); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.290 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.738 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.615 W/kg
SAR(1 g) = 0.157 W/kg; SAR(10 g) = 0.063 W/kg
Maximum value of SAR (measured) = 0.287 W/kg



0 dB = 0.287 W/kg = -5.43 dBW/kg

Date: 2018/11/23

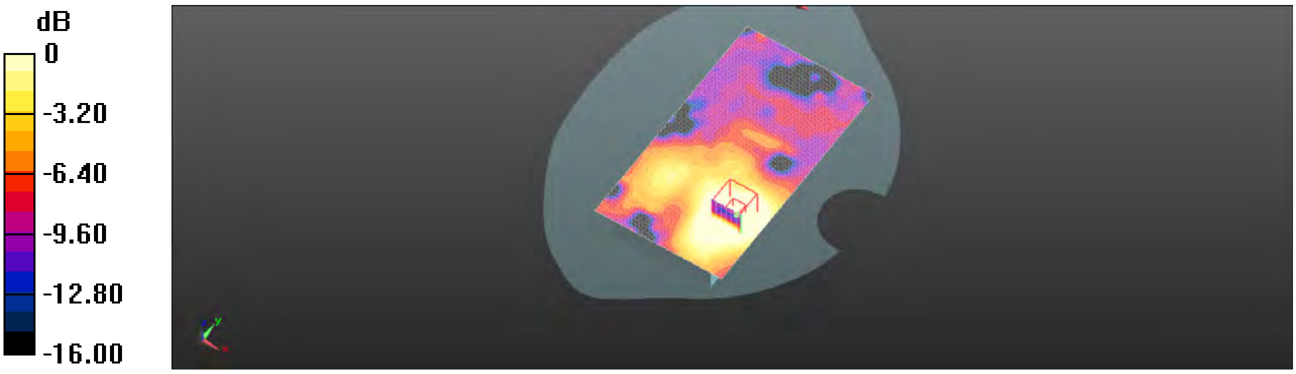
WLAN 802.11a 5.8G_ Product sprcific 10g _Back side_CH 149_0mm
Communication System: WLAN 5G; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5745 MHz; σ = 5.912 S/m; ε_r = 49.264; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4, 4, 4); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (101x181x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 1.45 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.692 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.07 W/kg
SAR(1 g) = 0.785 W/kg; SAR(10 g) = 0.303 W/kg
Maximum value of SAR (measured) = 1.43 W/kg



0 dB = 1.43 W/kg = 2.43 dBW/kg

6. SAR System Performance Verification

Date: 2018/11/6

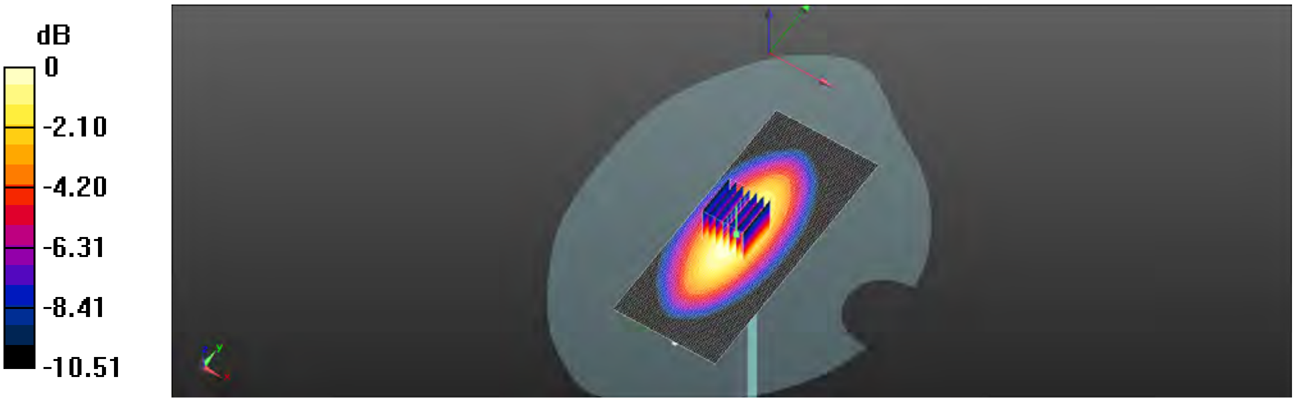
Dipole 835 MHz_SN:4d120_Head
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.872 S/m; ε_r = 41.898; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.5, 9.5, 9.5); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (51x71x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 3.00 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.98 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.60 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.06 W/kg



0 dB = 3.06 W/kg = 4.85 dBW/kg

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Date: 2018/11/15

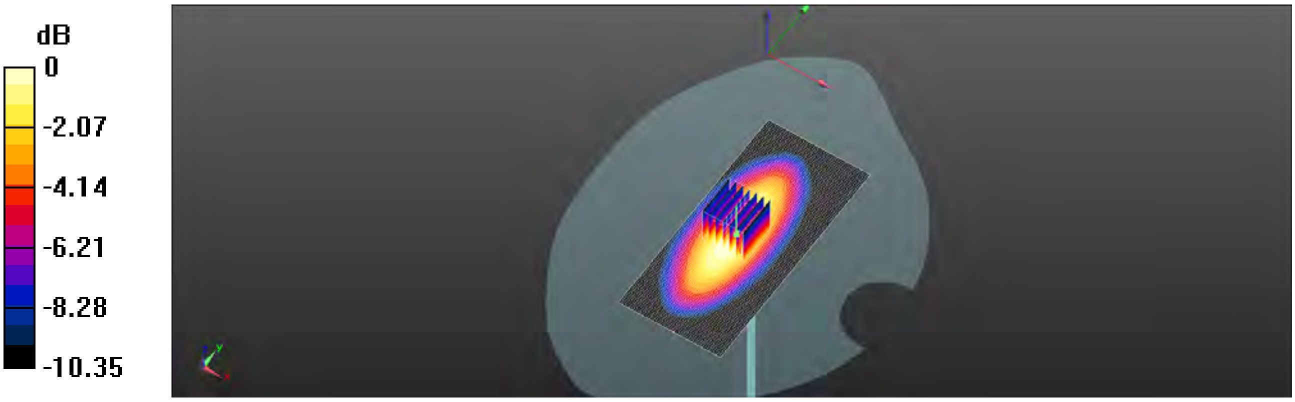
Dipole 835 MHz_SN:4d120_Body
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.989 S/m; ε_r = 56.552; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(9.56, 9.56, 9.56); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 3.06 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.29 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.61 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.07 W/kg



0 dB = 3.07 W/kg = 4.87 dBW/kg

Date: 2018/11/7

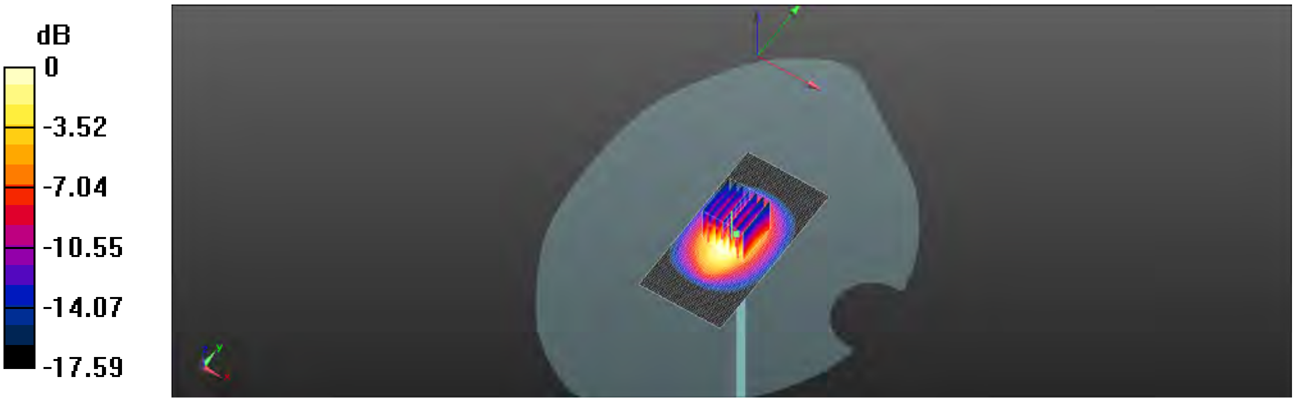
Dipole 1750 MHz_SN:1023_Head
Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.33 S/m; ε_r = 40.885; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(8.32, 8.32, 8.32); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 13.2 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.58 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.17 W/kg; SAR(10 g) = 4.85 W/kg
Maximum value of SAR (measured) = 13.2 W/kg



0 dB = 13.2 W/kg = 11.20 dBW/kg

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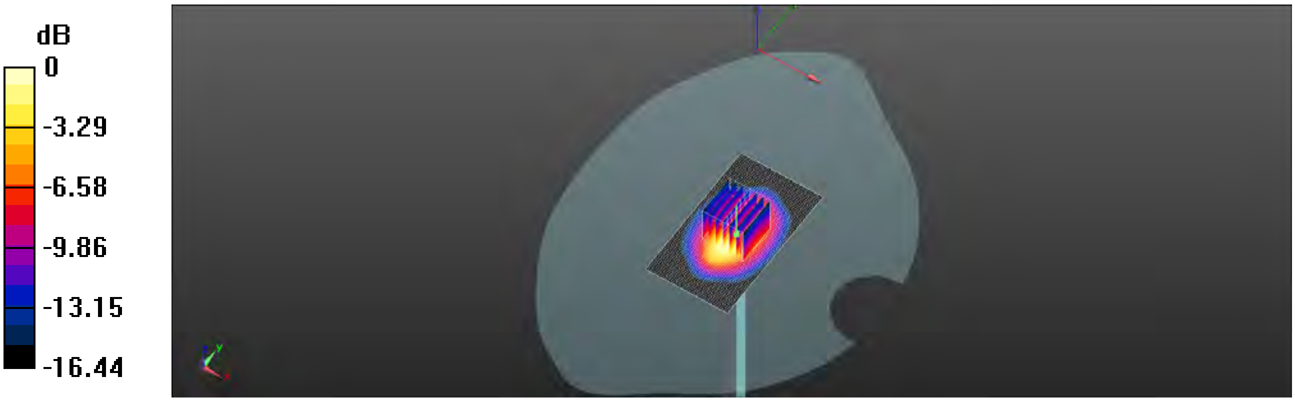
Date: 2018/11/16

Dipole 1750 MHz_SN:1023_Body
Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.52 S/m; ε_r = 52.224; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:
- Probe: EX3DV4 – SN3938; ConvF(7.83, 7.83, 7.83); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x71x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 14.2 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.40 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.15 W/kg; SAR(10 g) = 5.06 W/kg
Maximum value of SAR (measured) = 13.5 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

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Date: 2018/11/8

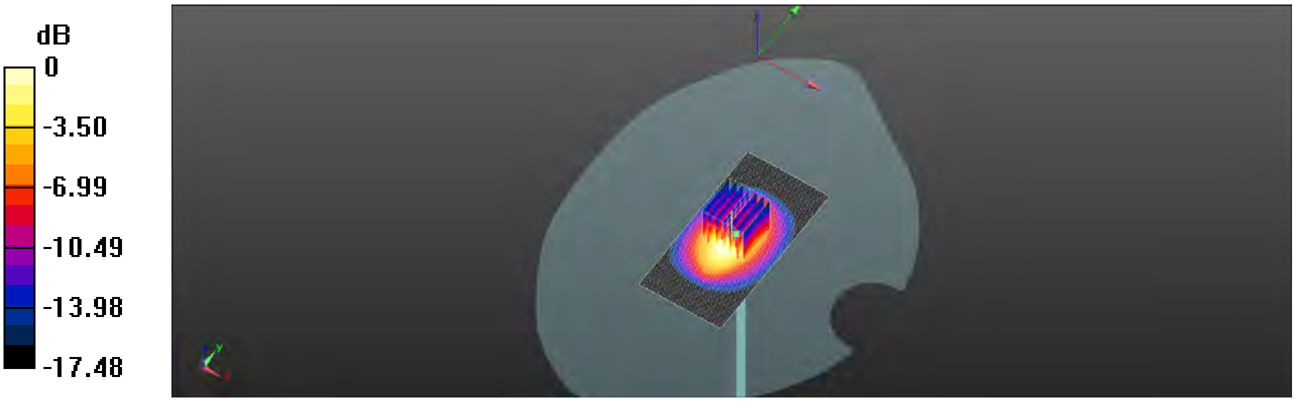
Dipole 1900 MHz_SN:5d173_Head
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.358 S/m; ε_r = 41.22; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (51x91x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 17.4 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.0 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 21.6 W/kg
SAR(1 g) = 9.86 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (measured) = 16.7 W/kg



0 dB = 16.7 W/kg = 12.23 dBW/kg

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Date: 2018/11/17

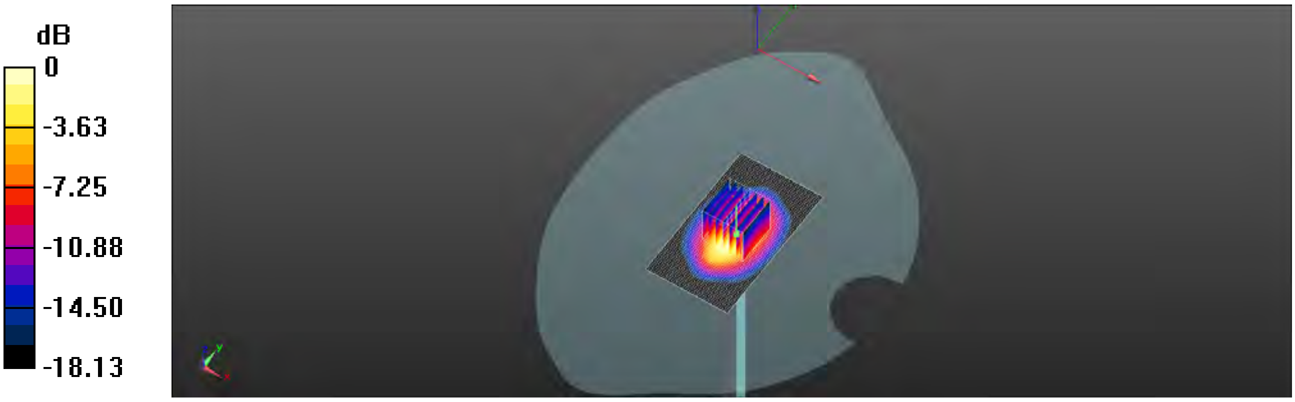
Dipole 1900 MHz_SN:5d173_Body
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.554 S/m; ε_r = 52.842; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x101x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 14.3 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.69 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 9.92 W/kg; SAR(10 g) = 5.2 W/kg
Maximum value of SAR (measured) = 14.2 W/kg



0 dB = 14.2 W/kg = 11.52 dBW/kg

Date: 2018/11/9

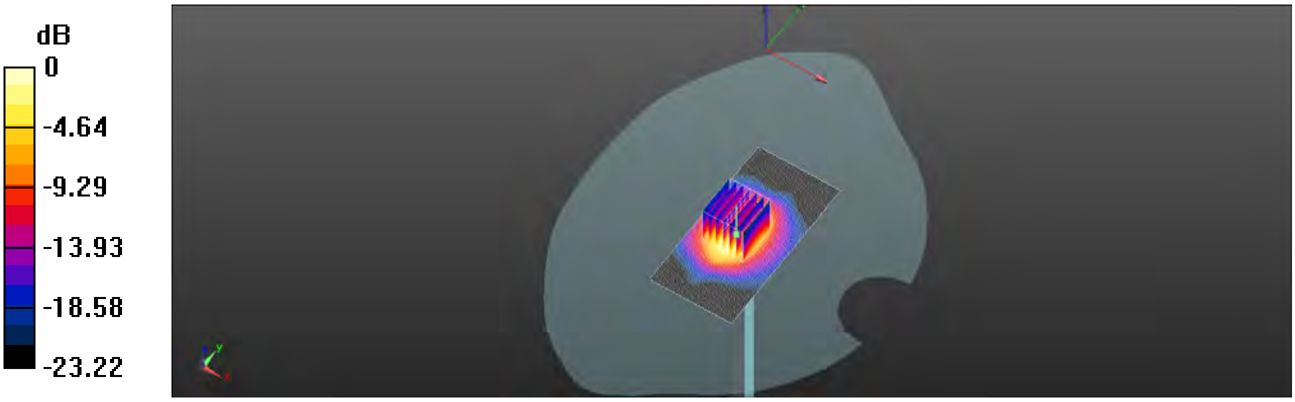
Dipole 2450 MHz_SN:727_Head
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.756 S/m; ε_r = 38.828; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 20.8 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 12.8 W/kg; SAR(10 g) = 6.06 W/kg
Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg

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Date: 2018/11/18

Dipole 2450 MHz_SN:727_Body

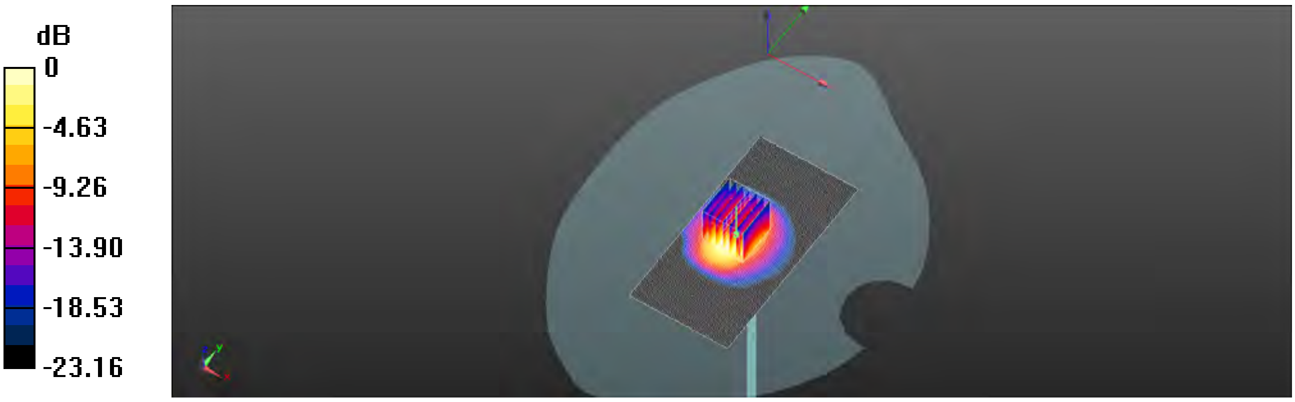
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 2.001 S/m; ε_r = 51.087; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x131x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 22.3 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.0 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 29.2 W/kg
SAR(1 g) = 12.7 W/kg; SAR(10 g) = 6.03 W/kg
Maximum value of SAR (measured) = 21.1 W/kg



0 dB = 21.1 W/kg = 13.23 dBW/kg

Date: 2018/11/10

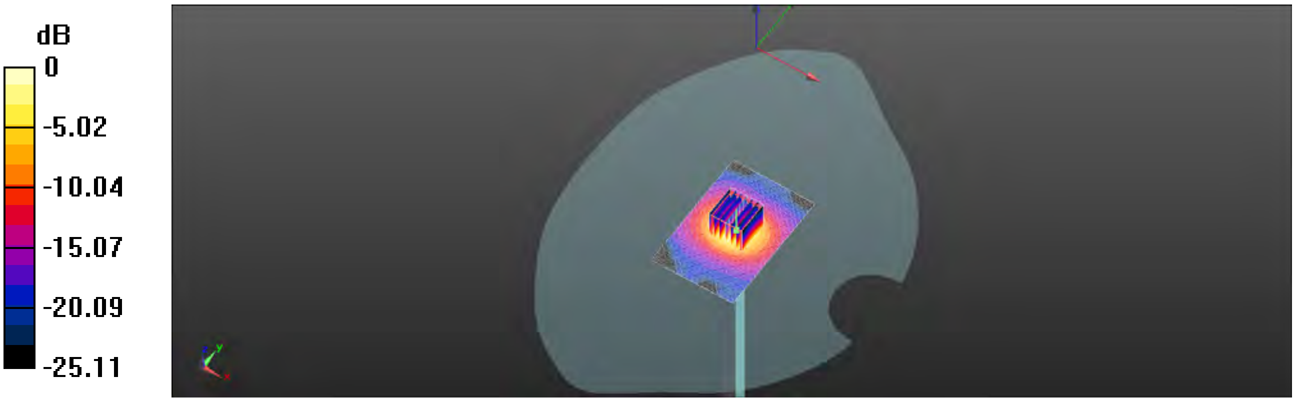
Dipole 2600 MHz_SN:1005_Head
Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 1.917 S/m; ε_r = 38.432; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.11, 7.11, 7.11); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 23.8 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.46 W/kg
Maximum value of SAR (measured) = 22.6 W/kg



0 dB = 22.6 W/kg = 13.54 dBW/kg

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Date: 2018/11/19

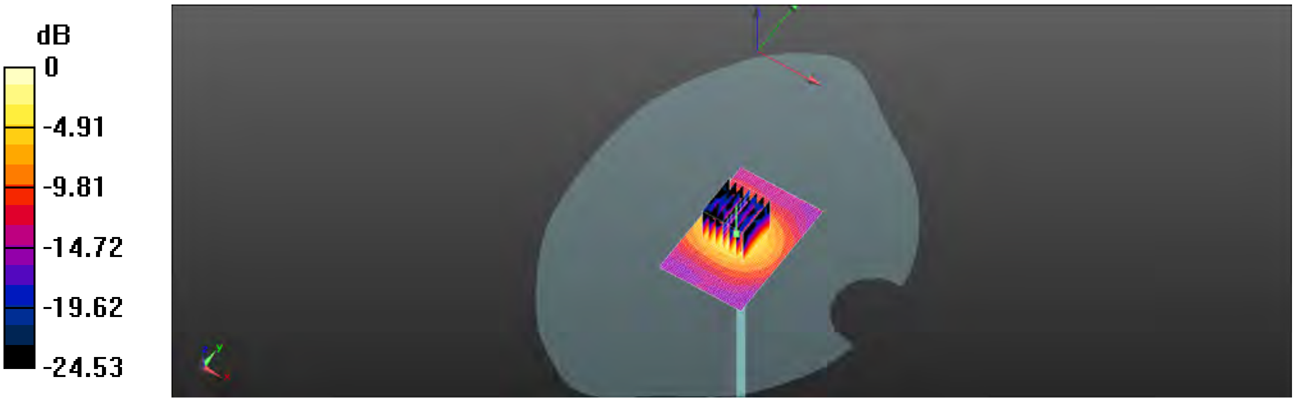
Dipole 2600 MHz_SN:1005_Body
Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.221 S/m; ε_r = 53.375; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.7°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 – SN3938; ConvF(7.15, 7.15, 7.15); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 23.3 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.1 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 31.3 W/kg
SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.18 W/kg
Maximum value of SAR (measured) = 22.3 W/kg



0 dB = 22.3 W/kg = 13.47 dBW/kg

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Date: 2018/11/11

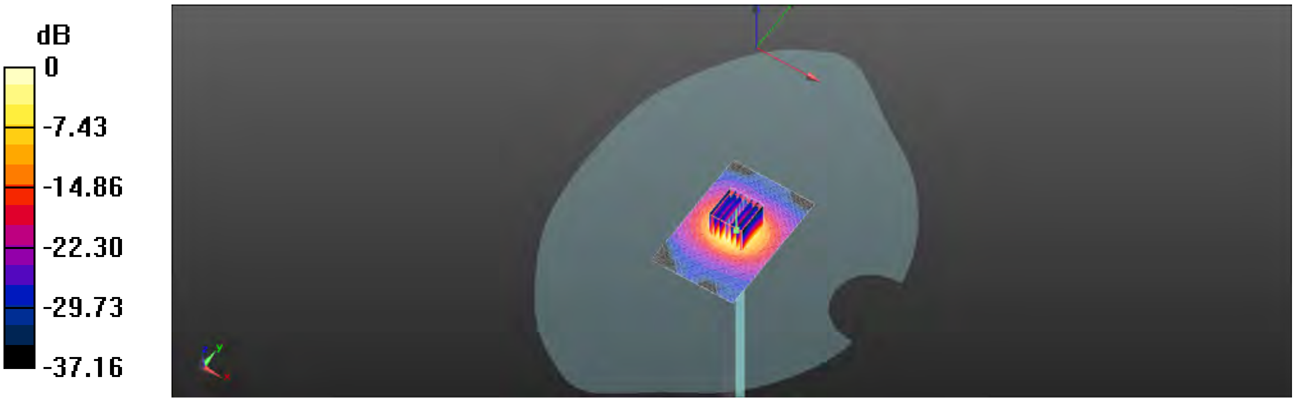
Dipole 5200 MHz_SN:1023_Head
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 4.509 S/m; ε_r = 35.101; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.7°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 17.1 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 65.07 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 33.1 W/kg
SAR(1 g) = 7.75 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (measured) = 17.5 W/kg



0 dB = 17.5 W/kg = 12.43 dBW/kg

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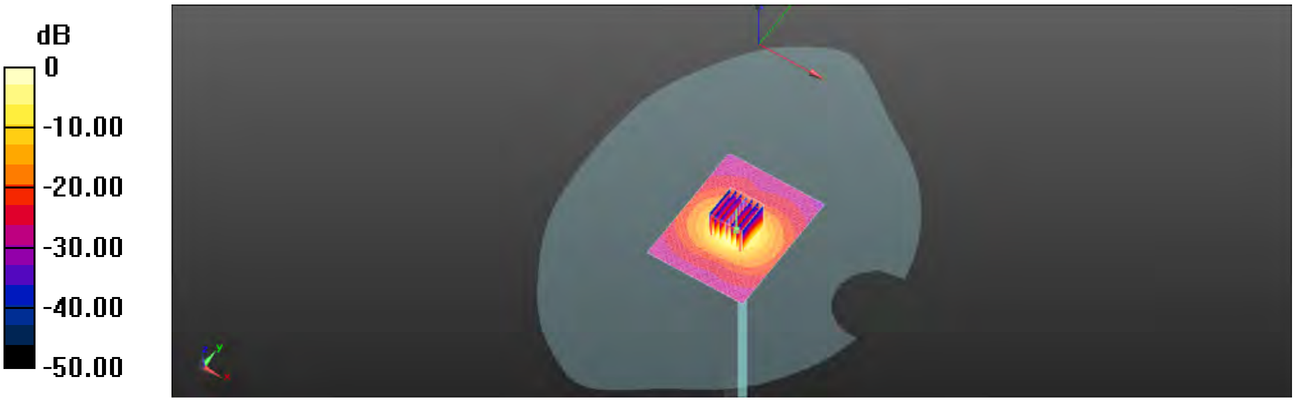
Date: 2018/11/20

Dipole 5200MHz_SN:1023_Body
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 5.456 S/m; ε_r = 49.911; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:
- Probe: EX3DV4 - SN3938; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 15.2 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 56.71 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 7.16 W/kg; SAR(10 g) = 2.02 W/kg
Maximum value of SAR (measured) = 15.4 W/kg



0 dB = 15.4 W/kg = 11.88 dBW/kg

Date: 2018/11/12

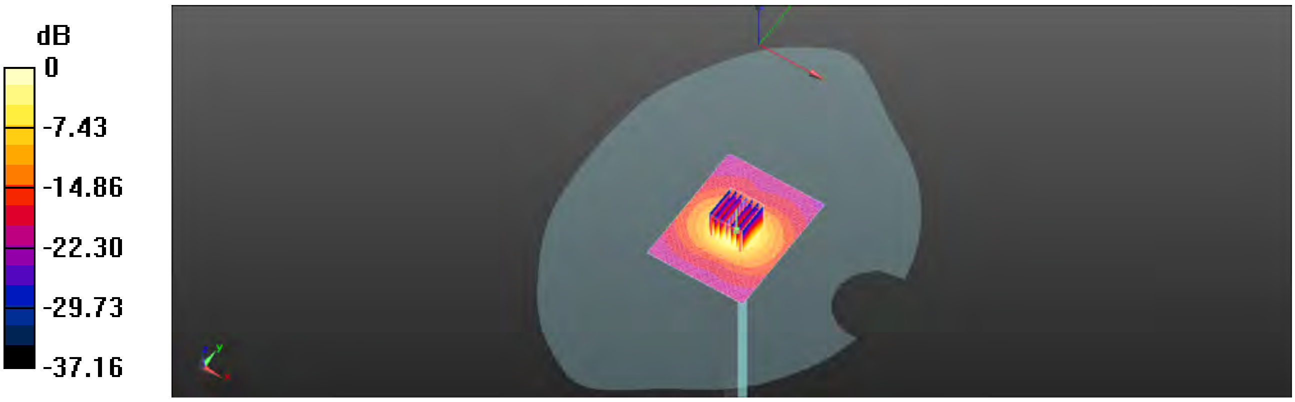
Dipole 5300 MHz_SN:1023_Head
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 4.659 S/m; ε_r = 34.774; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 18.1 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 65.57 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 34.1 W/kg
SAR(1 g) = 8.05 W/kg; SAR(10 g) = 2.31 W/kg
Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

Date: 2018/11/21

Dipole 5300MHz_SN:1023_Body

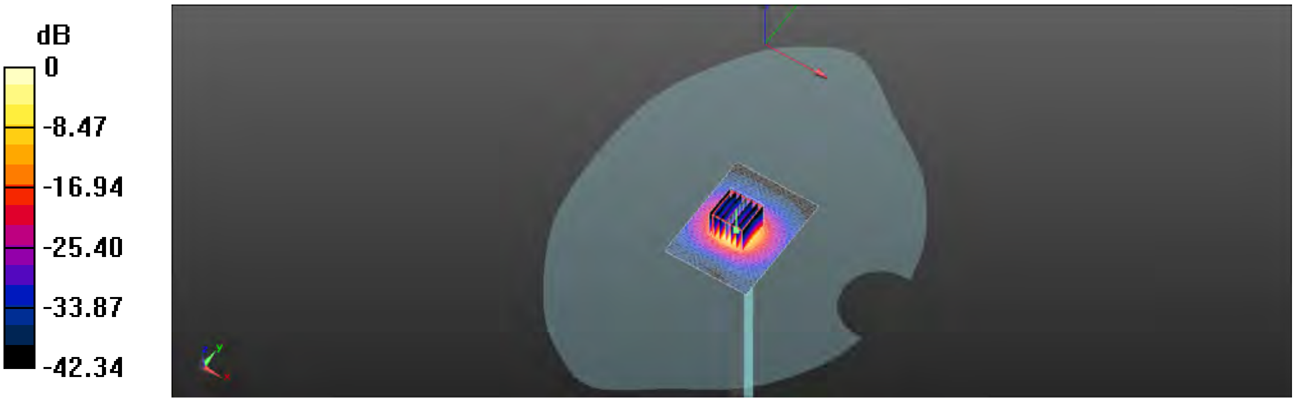
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 5.573 S/m; ε_r = 49.768; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.9°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.10(7373)

Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 16.1 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 59.33 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 31.8 W/kg
SAR(1 g) = 7.34 W/kg; SAR(10 g) = 2.01 W/kg
Maximum value of SAR (measured) = 16.1 W/kg



0 dB = 16.1 W/kg = 12.08 dBW/kg

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Date: 2018/11/13

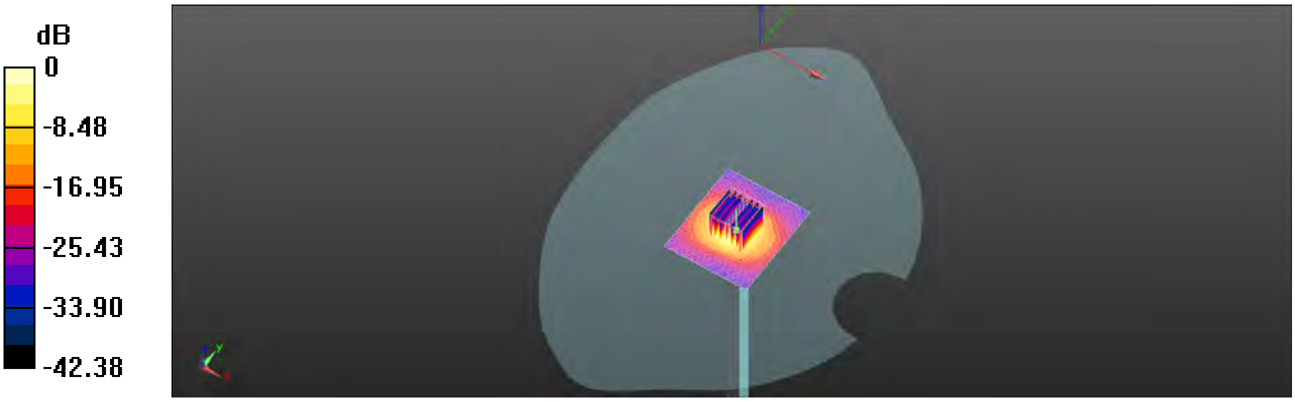
Dipole 5600 MHz_SN:1023_Head
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.117 S/m; ε_r = 35.365; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.65, 4.65, 4.65); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 18.6 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 61.90 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 39.7 W/kg
SAR(1 g) = 8.18 W/kg; SAR(10 g) = 2.35 W/kg
Maximum value of SAR (measured) = 18.0 W/kg



0 dB = 18.0 W/kg = 12.56 dBW/kg

Date: 2018/11/22

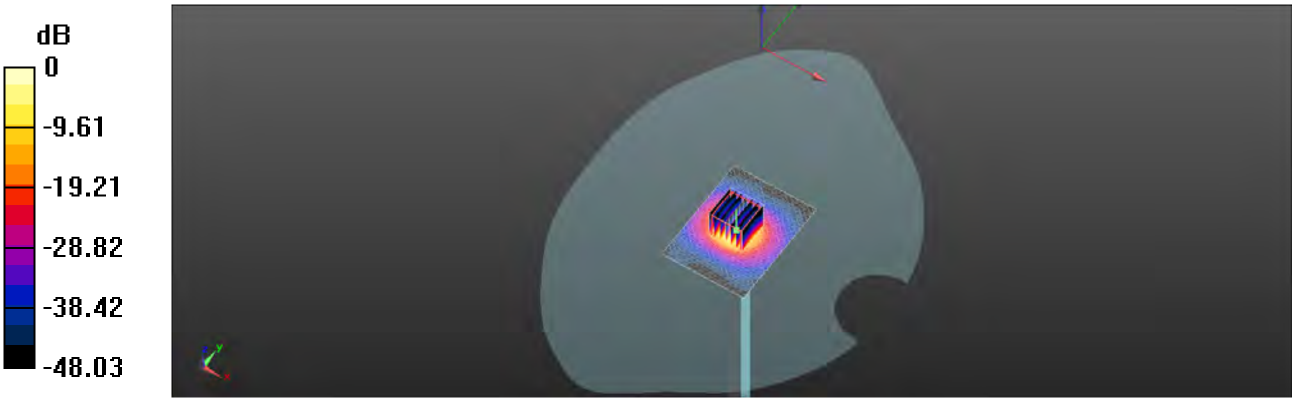
Dipole 5600MHz_SN:1023_Body
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.745 S/m; ε_r = 49.514; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.1°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(3.77, 3.77, 3.77); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.10(7373)

Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 17.1 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 59.71 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 34.6 W/kg
SAR(1 g) = 7.9 W/kg; SAR(10 g) = 2.2 W/kg
Maximum value of SAR (measured) = 17.1 W/kg



0 dB = 17.1 W/kg = 12.32 dBW/kg

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Date: 2018/11/14

Dipole 5800 MHz_SN:1023_Head

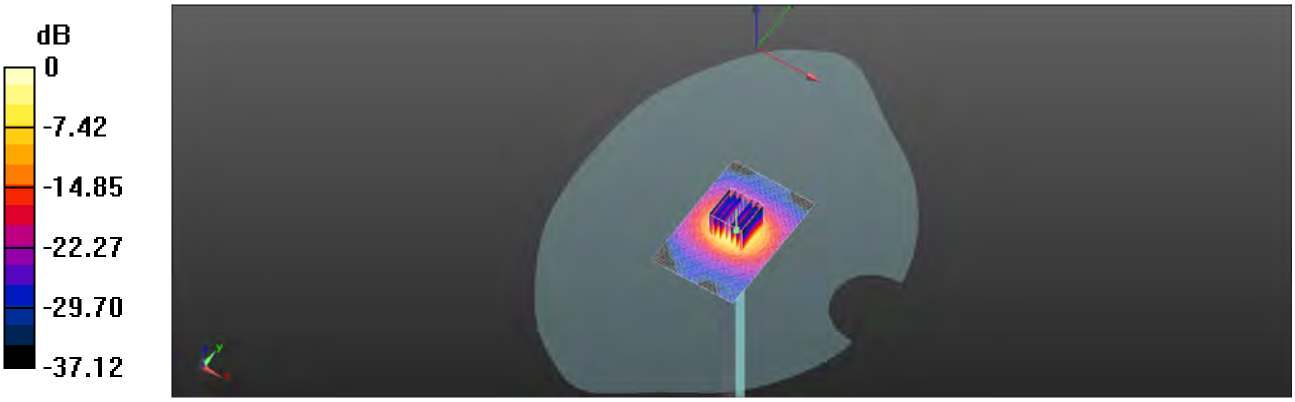
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.174 S/m; ε_r = 36.232; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.76, 4.76, 4.76); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 16.6 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 58.02 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 37.3 W/kg
SAR(1 g) = 7.82 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 16.1 W/kg



0 dB = 16.1 W/kg = 12.07 dBW/kg

Date: 2018/11/23

Dipole 5800 MHz_SN:1023_Body

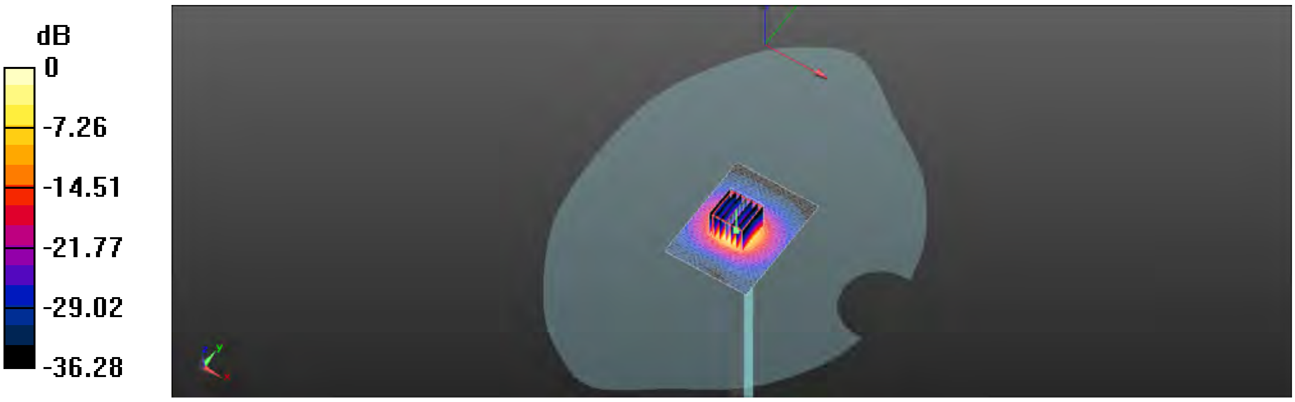
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.979 S/m; ε_r = 49.207; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4, 4, 4); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 16.1 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 53.97 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 33.1 W/kg
SAR(1 g) = 7.45 W/kg; SAR(10 g) = 2.11 W/kg
Maximum value of SAR (measured) = 16.3 W/kg



0 dB = 16.3 W/kg = 12.12 dBW/kg

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7. DAE & Probe Calibration Certificate

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Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **DAE4-1336_Aug18**

CALIBRATION CERTIFICATE

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

Calibration procedure(s): QA CAL-06.v29
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: August 06, 2018

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	31-Aug-17 (No:21092)	Aug-18
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	04-Jan-18 (in house check)	In house check: Jan-19
Calibrator Box V2.1	SE UMS 006 AA 1002	04-Jan-18 (in house check)	In house check: Jan-19

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Laboratory Technician	
Approved by:	Sven Kühn	Deputy Manager	i.V.

Issued: August 6, 2018

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Glossary

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

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The 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.

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DC Voltage Measurement

A/D - Converter Resolution nominal

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

Low Range: 1LSB = 61nV , full range = -1.......+3mV

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

Calibration Factors	X	Y	Z
High Range	403.344 ± 0.02% (k=2)	403.624 ± 0.02% (k=2)	403.107 ± 0.02% (k=2)
Low Range	3.95102 ± 1.50% (k=2)	3.98703 ± 1.50% (k=2)	3.99683 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	287.0 ° ± 1 °

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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	200042.98	3.65	0.00
Channel X	+ Input	20006.34	1.11	0.01
Channel X	- Input	-20005.65	-0.58	0.00
Channel Y	+ Input	200034.32	0.12	0.00
Channel Y	+ Input	20003.47	-1.57	-0.01
Channel Y	- Input	-20006.39	-1.21	0.01
Channel Z	+ Input	200032.22	-2.06	-0.00
Channel Z	+ Input	20002.78	-2.14	-0.01
Channel Z	- Input	-20007.34	-2.09	0.01

Low Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	2001.47	0.30	0.01
Channel X	+ Input	201.92	0.79	0.39
Channel X	- Input	-198.26	0.59	-0.30
Channel Y	+ Input	2001.56	0.37	0.02
Channel Y	+ Input	200.97	-0.11	-0.05
Channel Y	- Input	-199.34	-0.43	0.22
Channel Z	+ Input	2001.12	0.04	0.00
Channel Z	+ Input	200.15	-0.88	-0.44
Channel Z	- Input	-200.14	-1.15	0.58

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	6.04	4.72
	- 200	-4.13	-4.79
Channel Y	200	-3.65	-3.78
	200	2.68	2.45
Channel Z	200	22.40	22.16
	- 200	-24.83	-25.10

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	-	6.12	-1.64
Channel Y	200	9.19	-	6.46
Channel Z	200	8.44	6.31	-

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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	15666	16509
Channel Y	15907	15587
Channel Z	15855	15507

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	0.87	-0.00	2.62	0.36
Channel Y	3.53	2.67	4.59	0.34
Channel Z	-0.18	-1.34	1.53	0.54

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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Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **EX3-3938_Oct18**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3938
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date	October 24, 2018

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 NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

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

Issued: October 24, 2018

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Accreditation No.: **SCS 0108**

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, ", "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

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).

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Probe EX3DV4

SN:3938

Manufactured: May 2, 2013
Calibrated: October 24, 2018

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

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.51	0.57	0.33	± 10.1 %
DCP (mV)[B]	103.2	100.3	107.8	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[C] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	164.0	±3.5 %
		Y	0.0	0.0	1.0		174.2	
		Z	0.0	0.0	1.0		176.3	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	59.09	438.9	35.15	26.09	1.206	5.10	1.012	0.575	1.009
Y	53.22	408.3	37.24	24.25	1.457	5.10	0.000	0.766	1.013
Z	46.65	332.5	32.92	15.26	1.153	4.98	2.000	0.225	1.006

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 Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[C] 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:3938

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)	Unc (k=2)
750	41.9	0.89	9.82	9.82	9.82	0.45	0.80	± 12.0 %
835	41.5	0.90	9.50	9.50	9.50	0.50	0.85	± 12.0 %
900	41.5	0.97	9.25	9.25	9.25	0.33	1.04	± 12.0 %
1450	40.5	1.20	8.53	8.53	8.53	0.30	0.86	± 12.0 %
1750	40.1	1.37	8.32	8.32	8.32	0.36	0.90	± 12.0 %
1900	40.0	1.40	7.85	7.95	7.95	0.29	0.90	± 12.0 %
2000	40.0	1.40	7.93	7.93	7.93	0.36	0.80	± 12.0 %
2300	39.5	1.67	7.59	7.59	7.59	0.37	0.80	± 12.0 %
2450	39.2	1.80	7.17	7.17	7.17	0.39	0.83	± 12.0 %
2600	39.0	1.96	7.11	7.11	7.11	0.38	0.87	± 12.0 %
5250	35.9	4.71	5.00	5.00	5.00	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.65	4.65	4.65	0.40	1.80	± 13.1 %
5750	35.4	5.22	4.76	4.76	4.76	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[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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EX3DV4– SN:3938 October 24, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

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)	Unc (k=2)
750	55.5	0.96	9.72	9.72	9.72	0.46	0.87	± 12.0 %
835	55.2	0.97	9.56	9.56	9.56	0.41	0.92	± 12.0 %
900	55.0	1.05	9.33	9.33	9.33	0.48	0.87	± 12.0 %
1450	54.0	1.30	7.98	7.98	7.98	0.32	0.90	± 12.0 %
1750	53.4	1.49	7.83	7.83	7.83	0.43	0.90	± 12.0 %
1900	53.3	1.52	7.52	7.52	7.52	0.33	0.96	± 12.0 %
2000	53.3	1.52	7.62	7.62	7.62	0.38	0.89	± 12.0 %
2300	52.9	1.81	7.33	7.33	7.33	0.42	0.87	± 12.0 %
2450	52.7	1.95	7.30	7.30	7.30	0.35	0.87	± 12.0 %
2600	52.5	2.16	7.15	7.15	7.15	0.33	0.95	± 12.0 %
5250	48.9	5.36	4.23	4.23	4.23	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.77	3.77	3.77	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.00	4.00	4.00	0.50	1.90	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[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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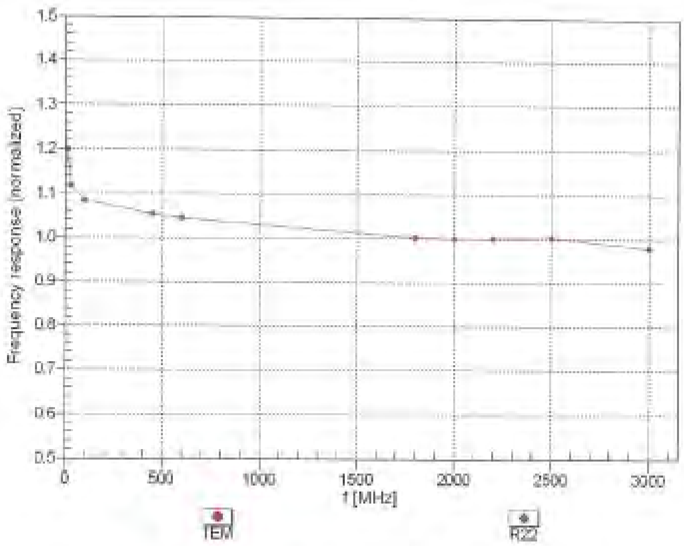
Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

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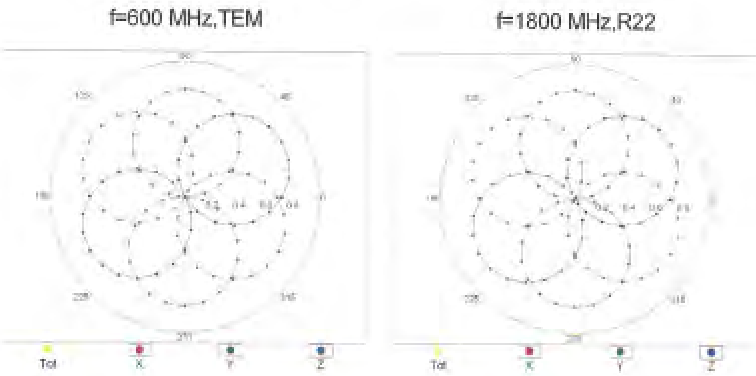
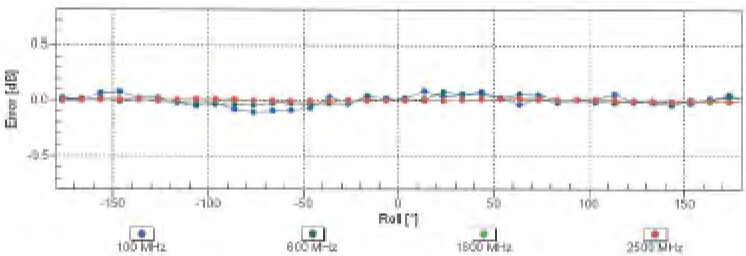
Receiving Pattern (ϕ), ϑ = 0°





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

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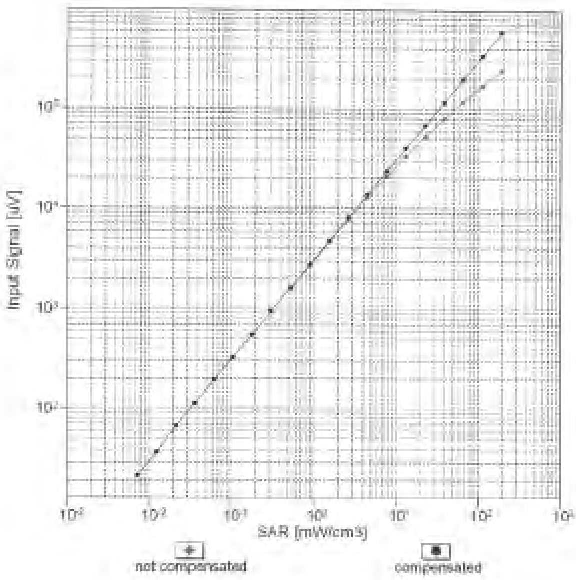
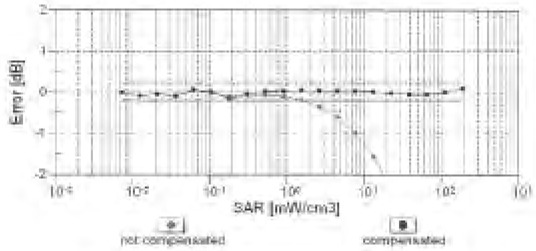
Dynamic Range f(SAR$_{head}$)

(TEM cell , f_{eval}= 1900 MHz)





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

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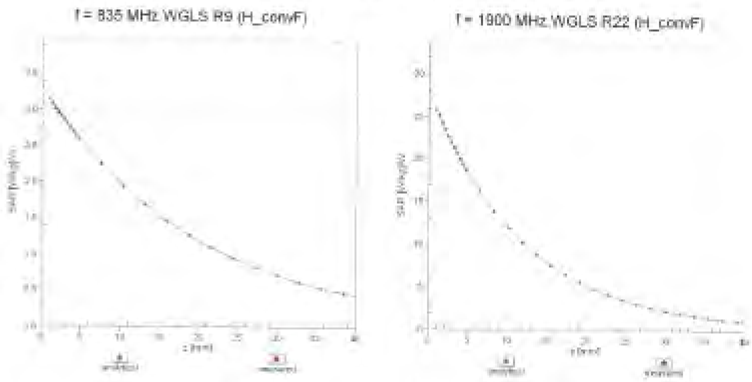
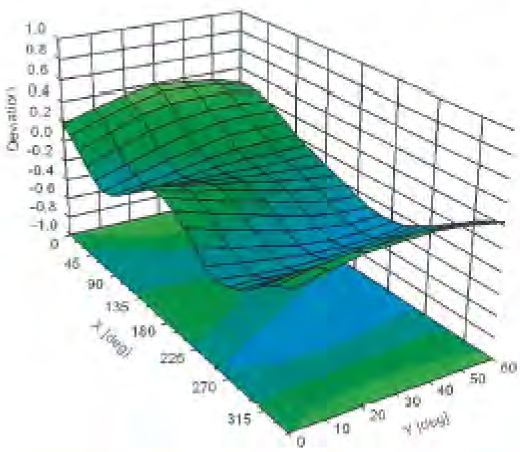
Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-26.4
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	164.0	± 3.5 %
		Y	0.00	0.00	1.00		174.2	
		Z	0.00	0.00	1.00		176.3	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	11.84	84.28	19.03	10.00	20.0	± 9.6 %
		Y	4.75	72.52	14.55		20.0	
		Z	2.70	65.86	10.62		20.0	
10011-CAB	UMTS-FDD (WCDMA)	X	1.25	71.04	17.46	0.00	150.0	± 9.6 %
		Y	0.67	65.19	13.50		150.0	
		Z	1.10	69.84	16.56		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.29	65.77	16.62	0.41	150.0	± 9.6 %
		Y	1.13	63.57	14.74		150.0	
		Z	1.17	64.77	15.66		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	5.06	67.01	17.40	1.46	150.0	± 9.6 %
		Y	4.93	66.63	17.09		150.0	
		Z	4.79	66.72	16.84		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	100.00	118.51	30.68	9.39	50.0	± 9.6 %
		Y	100.00	117.47	30.14		50.0	
		Z	9.68	81.68	18.25		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	100.00	118.45	30.70	9.57	50.0	± 9.6 %
		Y	100.00	117.42	30.17		50.0	
		Z	8.28	79.56	17.55		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	116.27	28.62	6.56	60.0	± 9.6 %
		Y	100.00	113.88	27.38		60.0	
		Z	17.36	88.43	18.89		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	14.85	105.13	41.16	12.57	50.0	± 9.6 %
		Y	6.69	80.06	30.32		50.0	
		Z	5.13	73.32	26.13		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	28.61	116.31	40.38	9.56	60.0	± 9.6 %
		Y	17.18	103.12	35.82		60.0	
		Z	10.76	92.22	31.22		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	116.23	27.82	4.80	80.0	± 9.6 %
		Y	100.00	112.20	25.80		80.0	
		Z	100.00	105.42	22.06		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	117.56	27.68	3.55	100.0	± 9.6 %
		Y	100.00	111.19	24.62		100.0	
		Z	100.00	105.06	21.28		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	14.44	99.44	33.73	7.80	80.0	± 9.6 %
		Y	10.36	91.48	30.62		80.0	
		Z	6.98	83.31	26.80		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	100.00	115.12	27.62	5.30	70.0	± 9.6 %
		Y	100.00	111.80	25.93		70.0	
		Z	13.15	85.08	17.21		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	120.41	27.44	1.88	100.0	± 9.6 %
		Y	100.00	105.86	20.53		100.0	
		Z	100.00	102.30	18.90		100.0	

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10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	100.00	129.17	29.93	1.17	100.0	± 9.6 %
		Y	100.00	101.34	18.13		100.0	
		Z	100.00	104.25	16.92		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	100.00	128.01	35.11	5.30	70.0	± 9.6 %
		Y	30.26	106.06	28.70		70.0	
		Z	7.06	82.86	20.36		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	31.82	111.82	29.61	1.88	100.0	± 9.6 %
		Y	4.94	81.70	19.61		100.0	
		Z	3.36	77.14	17.43		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	8.76	93.74	24.54	1.17	100.0	± 9.6 %
		Y	2.88	74.38	16.61		100.0	
		Z	2.45	74.78	16.51		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	100.00	128.23	35.27	5.30	70.0	± 9.6 %
		Y	48.56	114.02	30.85		70.0	
		Z	8.61	85.86	21.44		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	28.47	109.85	29.14	1.88	100.0	± 9.6 %
		Y	4.63	80.88	19.28		100.0	
		Z	3.10	76.20	17.06		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	9.40	95.18	25.08	1.17	100.0	± 9.6 %
		Y	2.66	74.97	16.94		100.0	
		Z	2.52	75.36	16.85		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	2.81	79.68	19.30	0.00	150.0	± 9.6 %
		Y	1.40	67.94	13.51		150.0	
		Z	2.58	79.60	18.81		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	100.00	114.29	27.89	7.78	50.0	± 9.6 %
		Y	100.00	112.24	26.83		50.0	
		Z	7.08	77.78	15.66		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.00	111.10	2.98	0.00	150.0	± 9.6 %
		Y	0.12	121.97	13.25		150.0	
		Z	0.02	124.98	11.44		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	100.00	120.31	32.96	13.80	25.0	± 9.6 %
		Y	26.80	98.60	27.12		25.0	
		Z	6.10	73.04	18.88		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	100.00	118.79	31.18	10.79	40.0	± 9.6 %
		Y	42.73	105.35	27.59		40.0	
		Z	6.52	75.70	16.44		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	59.92	116.40	32.89	9.03	50.0	± 9.6 %
		Y	20.27	96.61	26.81		50.0	
		Z	8.73	81.48	20.30		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	9.49	90.34	29.75	6.55	100.0	± 9.6 %
		Y	7.41	84.68	27.34		100.0	
		Z	5.31	78.46	24.34		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.45	68.16	17.63	0.61	110.0	± 9.6 %
		Y	1.24	65.28	15.64		110.0	
		Z	1.24	66.08	16.24		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	100.00	138.52	35.86	1.30	110.0	± 9.6 %
		Y	100.00	127.82	31.55		110.0	
		Z	75.11	127.04	31.74		110.0	

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10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	37.93	122.29	34.76	2.04	110.0	± 9.6 %
		Y	7.04	91.70	25.29		110.0	
		Z	3.71	82.53	21.92		110.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.83	66.93	16.78	0.49	100.0	± 9.6 %
		Y	4.68	66.44	16.40		100.0	
		Z	4.61	66.82	16.41		100.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.86	67.07	16.91	0.72	100.0	± 9.6 %
		Y	4.71	66.58	16.52		100.0	
		Z	4.62	66.89	16.47		100.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	5.19	67.38	17.15	0.86	100.0	± 9.6 %
		Y	5.02	66.91	16.79		100.0	
		Z	4.90	67.10	16.66		100.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	5.07	67.37	17.30	1.21	100.0	± 9.6 %
		Y	4.91	66.89	16.94		100.0	
		Z	4.77	66.99	16.73		100.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	5.11	67.44	17.51	1.46	100.0	± 9.6 %
		Y	4.95	66.98	17.15		100.0	
		Z	4.78	66.99	16.85		100.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	5.40	67.52	17.91	2.04	100.0	± 9.6 %
		Y	5.26	67.17	17.62		100.0	
		Z	5.06	67.09	17.23		100.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	5.51	67.80	18.25	2.55	100.0	± 9.6 %
		Y	5.36	67.40	17.94		100.0	
		Z	5.11	67.14	17.41		100.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	5.58	67.69	18.40	2.67	100.0	± 9.6 %
		Y	5.44	67.37	18.13		100.0	
		Z	5.19	67.11	17.58		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	5.17	67.17	17.75	1.99	100.0	± 9.6 %
		Y	5.05	66.81	17.46		100.0	
		Z	4.88	66.78	17.09		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	5.21	67.68	18.06	2.30	100.0	± 9.6 %
		Y	5.08	67.27	17.74		100.0	
		Z	4.87	67.11	17.28		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	5.30	67.92	18.44	2.83	100.0	± 9.6 %
		Y	5.18	67.55	18.13		100.0	
		Z	4.94	67.26	17.56		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	5.29	67.90	18.65	3.30	100.0	± 9.6 %
		Y	5.19	67.54	18.34		100.0	
		Z	4.93	67.18	17.70		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	5.40	68.28	19.10	3.82	90.0	± 9.6 %
		Y	5.28	67.86	18.77		90.0	
		Z	4.98	67.33	17.99		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	5.38	67.97	19.17	4.15	90.0	± 9.6 %
		Y	5.29	67.64	18.88		90.0	
		Z	5.00	67.13	18.10		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	5.41	68.03	19.26	4.30	90.0	± 9.6 %
		Y	5.32	67.72	18.98		90.0	
		Z	5.03	67.21	18.19		90.0	

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10081-CAB	CDMA2000 (1xRTT, RC3)	X	1.20	70.94	15.87	0.00	150.0	± 9.6 %
		Y	0.88	63.33	10.59		150.0	
		Z	0.97	69.12	14.01		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	1.35	61.30	5.54	4.77	80.0	± 9.6 %
		Y	1.15	60.10	5.56		80.0	
		Z	0.90	60.00	4.82		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	116.34	28.67	6.56	60.0	± 9.6 %
		Y	100.00	113.98	27.45		60.0	
		Z	15.90	88.08	18.81		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	1.98	69.10	16.78	0.00	150.0	± 9.6 %
		Y	1.88	66.14	14.64		150.0	
		Z	1.92	69.38	16.52		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.94	69.09	16.77	0.00	150.0	± 9.6 %
		Y	1.82	66.08	14.59		150.0	
		Z	1.87	69.33	16.49		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	38.67	116.31	40.37	9.56	60.0	± 9.6 %
		Y	17.22	103.14	35.83		60.0	
		Z	10.80	92.24	31.22		60.0	
10100-CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	3.51	72.21	17.62	0.00	150.0	± 9.6 %
		Y	2.94	69.12	15.85		150.0	
		Z	3.29	71.84	17.33		150.0	
10101-CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.42	68.37	16.44	0.00	150.0	± 9.6 %
		Y	3.15	66.88	15.45		150.0	
		Z	3.26	68.19	16.19		150.0	
10102-CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.51	68.25	16.50	0.00	150.0	± 9.6 %
		Y	3.25	66.87	15.57		150.0	
		Z	3.35	68.16	16.28		150.0	
10103-CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	9.10	80.51	22.32	3.98	65.0	± 9.6 %
		Y	7.71	77.60	21.05		65.0	
		Z	6.72	75.86	19.85		65.0	
10104-CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	8.36	77.67	22.08	3.98	65.0	± 9.6 %
		Y	7.56	75.78	21.18		65.0	
		Z	6.54	73.78	19.84		65.0	
10105-CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	8.22	77.35	22.27	3.98	65.0	± 9.6 %
		Y	7.00	74.28	20.84		65.0	
		Z	6.41	73.36	19.56		65.0	
10108-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	3.07	71.32	17.44	0.00	150.0	± 9.6 %
		Y	2.58	68.37	15.67		150.0	
		Z	2.86	71.00	17.15		150.0	
10109-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	3.09	68.24	16.43	0.00	150.0	± 9.6 %
		Y	2.80	66.64	15.30		150.0	
		Z	2.92	68.15	16.17		150.0	
10110-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.51	70.39	17.16	0.00	150.0	± 9.6 %
		Y	2.08	67.38	15.21		150.0	
		Z	2.30	70.10	16.80		150.0	
10111-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.83	69.15	16.90	0.00	150.0	± 9.6 %
		Y	2.49	67.13	15.44		150.0	
		Z	2.71	69.56	16.76		150.0	

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10112-CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.20	68.13	16.43	0.00	150.0	± 9.6 %
		Y	2.93	66.85	15.39		150.0	
		Z	3.04	68.13	16.21		150.0	
10113-CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.98	69.16	16.96	0.00	150.0	± 9.6 %
		Y	2.64	67.31	15.61		150.0	
		Z	2.87	69.66	16.87		150.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.21	67.32	16.54	0.00	150.0	± 9.6 %
		Y	5.08	66.89	16.21		150.0	
		Z	5.06	67.43	16.43		150.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.56	67.60	16.68	0.00	150.0	± 9.6 %
		Y	5.42	67.15	16.37		150.0	
		Z	5.34	67.52	16.46		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.33	67.58	16.59	0.00	150.0	± 9.6 %
		Y	5.18	67.09	16.26		150.0	
		Z	5.15	67.61	16.44		150.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.21	67.33	16.56	0.00	150.0	± 9.6 %
		Y	5.06	66.76	16.19		150.0	
		Z	5.03	67.31	16.39		150.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.63	67.75	16.76	0.00	150.0	± 9.6 %
		Y	5.56	67.34	16.48		150.0	
		Z	5.41	67.66	16.55		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.20	67.52	16.58	0.00	150.0	± 9.6 %
		Y	5.16	67.02	16.24		150.0	
		Z	5.13	67.55	16.43		150.0	
10140-CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.56	69.24	16.42	0.00	150.0	± 9.6 %
		Y	3.29	66.88	15.49		150.0	
		Z	3.39	68.15	16.19		150.0	
10141-CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.68	68.26	16.55	0.00	150.0	± 9.6 %
		Y	3.42	66.99	15.68		150.0	
		Z	3.52	68.25	16.36		150.0	
10142-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	2.31	70.61	17.16	0.00	150.0	± 9.6 %
		Y	1.84	67.11	14.76		150.0	
		Z	2.12	70.48	16.65		150.0	
10143-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.77	70.28	16.99	0.00	150.0	± 9.6 %
		Y	2.31	67.48	15.00		150.0	
		Z	2.68	70.99	16.78		150.0	
10144-CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	2.51	67.88	15.37	0.00	150.0	± 9.6 %
		Y	2.14	65.80	13.59		150.0	
		Z	2.29	67.65	14.87		150.0	
10145-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	1.73	80.80	15.10	0.00	150.0	± 9.6 %
		Y	1.11	63.66	10.90		150.0	
		Z	1.33	67.08	12.73		150.0	
10146-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	4.24	75.06	17.12	0.00	150.0	± 9.6 %
		Y	2.46	66.71	13.46		150.0	
		Z	2.38	66.35	12.25		150.0	
10147-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	6.45	81.80	19.47	0.00	150.0	± 9.6 %
		Y	3.10	71.79	14.97		150.0	
		Z	3.29	73.21	14.01		150.0	

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10149-CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	3.10	68.31	16.47	0.00	150.0	± 9.6 %
		Y	2.81	66.69	15.35		150.0	
		Z	2.93	68.23	16.22		150.0	
10150-CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.21	68.18	16.48	0.00	150.0	± 9.6 %
		Y	2.94	66.70	15.43		150.0	
		Z	3.05	68.20	16.26		150.0	
10151-CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	10.13	83.77	23.67	3.98	65.0	± 9.6 %
		Y	8.42	80.52	22.26		65.0	
		Z	6.89	77.61	20.59		65.0	
10152-CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	8.04	78.08	22.05	3.98	65.0	± 9.6 %
		Y	7.13	75.91	20.98		65.0	
		Z	6.04	73.59	19.44		65.0	
10153-CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	8.44	79.82	22.75	3.98	65.0	± 9.6 %
		Y	7.56	76.89	21.74		65.0	
		Z	6.48	74.70	20.30		65.0	
10154-CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.59	70.97	17.50	0.00	150.0	± 9.6 %
		Y	2.12	67.77	15.47		150.0	
		Z	2.38	70.74	17.16		150.0	
10155-CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.83	69.15	16.90	0.00	150.0	± 9.6 %
		Y	2.49	67.14	15.45		150.0	
		Z	2.71	69.07	16.78		150.0	
10156-CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	2.21	71.19	17.23	0.00	150.0	± 9.6 %
		Y	1.68	67.01	14.46		150.0	
		Z	2.01	71.01	16.65		150.0	
10157-CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	2.40	68.89	15.72	0.00	150.0	± 9.6 %
		Y	1.95	65.89	13.48		150.0	
		Z	2.19	68.70	14.94		150.0	
10158-CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.98	69.22	17.01	0.00	150.0	± 9.6 %
		Y	2.65	67.38	15.65		150.0	
		Z	2.88	69.75	16.93		150.0	
10159-CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.54	69.44	16.05	0.00	150.0	± 9.6 %
		Y	2.05	66.31	13.77		150.0	
		Z	2.34	69.42	15.34		150.0	
10160-CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	2.98	69.71	16.87	0.00	150.0	± 9.6 %
		Y	2.62	67.67	15.60		150.0	
		Z	2.78	69.58	16.72		150.0	
10161-CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	3.11	68.11	16.44	0.00	150.0	± 9.6 %
		Y	2.83	66.60	15.34		150.0	
		Z	2.95	68.19	16.22		150.0	
10162-CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.21	68.15	16.50	0.00	150.0	± 9.6 %
		Y	2.94	66.74	15.46		150.0	
		Z	3.08	68.32	16.32		150.0	
10166-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	4.07	71.03	19.91	3.01	150.0	± 9.6 %
		Y	3.79	69.95	19.36		150.0	
		Z	3.83	71.36	19.78		150.0	
10167-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	5.42	74.80	20.87	3.01	150.0	± 9.6 %
		Y	4.77	72.79	19.75		150.0	
		Z	5.29	75.01	20.77		150.0	

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10168-CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	6.05	77.17	21.96	3.01	150.0	± 9.6 %
		Y	5.30	75.09	21.09		150.0	
		Z	6.36	79.86	22.71		150.0	
10169-CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	3.85	72.93	20.70	3.01	150.0	± 9.6 %
		Y	3.33	70.15	19.41		150.0	
		Z	3.47	72.51	20.23		150.0	
10170-CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	6.37	81.48	23.72	3.01	150.0	± 9.6 %
		Y	4.75	76.10	21.63		150.0	
		Z	7.01	85.04	24.72		150.0	
10171-AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	4.87	75.76	20.53	3.01	150.0	± 9.6 %
		Y	3.87	71.72	18.83		150.0	
		Z	4.54	76.13	20.23		150.0	
10172-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	80.41	131.60	39.78	6.02	65.0	± 9.6 %
		Y	18.51	103.16	32.14		65.0	
		Z	14.22	97.99	29.18		65.0	
10173-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	100.00	127.75	36.65	6.02	65.0	± 9.6 %
		Y	30.31	107.15	31.45		65.0	
		Z	25.08	102.02	28.13		65.0	
10174-CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	60.73	116.92	33.35	6.02	65.0	± 9.6 %
		Y	21.73	99.84	28.80		65.0	
		Z	17.08	94.57	25.40		65.0	
10175-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	3.78	72.50	20.41	3.01	150.0	± 9.6 %
		Y	3.29	69.80	19.15		150.0	
		Z	3.40	71.98	19.88		150.0	
10176-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	6.38	81.51	23.73	3.01	150.0	± 9.6 %
		Y	4.76	76.12	21.65		150.0	
		Z	7.03	85.08	24.74		150.0	
10177-CAI	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	3.82	72.71	20.53	3.01	150.0	± 9.6 %
		Y	3.32	69.97	19.25		150.0	
		Z	3.44	72.23	20.02		150.0	
10178-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	6.26	81.12	23.55	3.01	150.0	± 9.6 %
		Y	4.70	75.86	21.51		150.0	
		Z	6.85	84.54	24.51		150.0	
10179-CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	5.53	78.38	21.95	3.01	150.0	± 9.6 %
		Y	4.26	73.73	20.08		150.0	
		Z	5.53	80.03	22.20		150.0	
10180-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	4.85	75.63	20.46	3.01	150.0	± 9.6 %
		Y	3.85	71.63	18.78		150.0	
		Z	4.51	75.97	20.14		150.0	
10181-CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	3.82	72.69	20.52	3.01	150.0	± 9.6 %
		Y	3.31	69.95	19.24		150.0	
		Z	3.44	72.20	20.01		150.0	
10182-CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	6.25	81.09	23.54	3.01	150.0	± 9.6 %
		Y	4.70	75.84	21.50		150.0	
		Z	6.83	84.50	24.49		150.0	
10183-AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	4.84	75.60	20.44	3.01	150.0	± 9.6 %
		Y	3.85	71.61	18.77		150.0	
		Z	4.50	75.94	20.13		150.0	

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10184-CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	3.83	72.74	20.54	3.01	150.0	± 9.6 %
		Y	3.32	70.00	19.27		150.0	
		Z	3.45	72.28	20.04		150.0	
10185-CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	6.29	81.18	23.58	3.01	150.0	± 9.6 %
		Y	4.72	75.91	21.53		150.0	
		Z	6.88	84.63	24.55		150.0	
10186-AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	4.86	75.68	20.48	3.01	150.0	± 9.6 %
		Y	3.87	71.68	18.80		150.0	
		Z	4.53	76.04	20.17		150.0	
10187-CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	3.84	72.79	20.60	3.01	150.0	± 9.6 %
		Y	3.33	70.05	19.33		150.0	
		Z	3.46	72.24	20.11		150.0	
10188-CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	6.59	82.17	24.08	3.01	150.0	± 9.6 %
		Y	4.88	76.63	21.93		150.0	
		Z	7.44	86.21	25.23		150.0	
10189-AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	5.01	76.28	20.81	3.01	150.0	± 9.6 %
		Y	3.96	72.12	19.08		150.0	
		Z	4.72	76.84	20.60		150.0	
10193-CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.64	66.78	16.35	0.00	150.0	± 9.6 %
		Y	4.48	66.22	15.91		150.0	
		Z	4.48	66.93	16.19		150.0	
10194-CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.84	67.15	16.46	0.00	150.0	± 9.6 %
		Y	4.66	66.55	16.03		150.0	
		Z	4.65	67.23	16.31		150.0	
10195-CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.88	67.16	16.47	0.00	150.0	± 9.6 %
		Y	4.70	66.58	16.05		150.0	
		Z	4.69	67.26	16.32		150.0	
10196-CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.66	66.88	16.38	0.00	150.0	± 9.6 %
		Y	4.49	66.29	15.93		150.0	
		Z	4.48	66.99	16.21		150.0	
10197-CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.85	67.17	16.47	0.00	150.0	± 9.6 %
		Y	4.67	66.58	16.04		150.0	
		Z	4.66	67.25	16.32		150.0	
10198-CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.89	67.18	16.48	0.00	150.0	± 9.6 %
		Y	4.70	66.60	16.06		150.0	
		Z	4.69	67.27	16.33		150.0	
10219-CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.61	66.90	16.35	0.00	150.0	± 9.6 %
		Y	4.43	66.30	15.89		150.0	
		Z	4.42	67.01	16.10		150.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.86	67.15	16.47	0.00	150.0	± 9.6 %
		Y	4.67	66.56	16.04		150.0	
		Z	4.65	67.22	16.31		150.0	
10221-CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.89	67.10	16.46	0.00	150.0	± 9.6 %
		Y	4.71	66.53	16.05		150.0	
		Z	4.70	67.20	16.31		150.0	
10222-CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	5.19	67.36	16.57	0.00	150.0	± 9.6 %
		Y	5.03	66.77	16.18		150.0	
		Z	5.01	67.33	16.39		150.0	

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10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.54	67.61	16.71	0.00	150.0	± 9.6 %
		Y	5.35	66.99	16.32		150.0	
		Z	5.29	67.45	16.47		150.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	5.24	67.46	16.55	0.00	150.0	± 9.6 %
		Y	5.06	66.87	16.16		150.0	
		Z	5.06	67.46	16.38		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.94	66.61	15.90	0.00	150.0	± 9.6 %
		Y	2.72	65.45	14.90		150.0	
		Z	2.80	66.78	15.59		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	100.00	127.97	36.79	6.02	65.0	± 9.6 %
		Y	33.01	106.86	32.02		65.0	
		Z	28.60	104.36	28.88		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	71.64	120.02	34.24	6.02	65.0	± 9.6 %
		Y	27.56	104.08	30.11		65.0	
		Z	21.67	98.19	26.50		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	83.76	133.19	40.33	6.02	65.0	± 9.6 %
		Y	27.23	111.37	34.65		65.0	
		Z	14.92	99.20	29.65		65.0	
10229-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	100.00	127.75	36.66	6.02	65.0	± 9.6 %
		Y	30.46	107.22	31.48		65.0	
		Z	25.36	102.20	28.19		65.0	
10230-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	64.64	118.06	33.66	6.02	65.0	± 9.6 %
		Y	25.67	102.71	29.64		65.0	
		Z	19.55	96.45	25.91		65.0	
10231-CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	74.78	130.72	39.63	6.02	65.0	± 9.6 %
		Y	26.26	109.74	34.10		65.0	
		Z	13.84	97.69	29.10		65.0	
10232-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	100.00	127.76	36.66	6.02	65.0	± 9.6 %
		Y	30.44	107.22	31.48		65.0	
		Z	25.32	102.18	28.18		65.0	
10233-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	64.74	118.10	33.67	6.02	65.0	± 9.6 %
		Y	25.69	102.71	29.64		65.0	
		Z	19.51	96.43	25.91		65.0	
10234-CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	66.79	128.16	38.87	6.02	65.0	± 9.6 %
		Y	23.59	108.16	33.53		65.0	
		Z	12.92	96.23	28.52		65.0	
10235-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	100.00	127.77	36.66	6.02	65.0	± 9.6 %
		Y	30.53	107.28	31.50		65.0	
		Z	25.37	102.23	28.19		65.0	
10236-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	65.78	118.34	33.73	6.02	65.0	± 9.6 %
		Y	25.93	102.67	29.68		65.0	
		Z	19.72	96.57	25.94		65.0	
10237-CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	78.22	131.13	39.74	6.02	65.0	± 9.6 %
		Y	25.46	109.93	34.15		65.0	
		Z	13.89	97.78	29.12		65.0	
10238-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	100.00	127.78	36.66	6.02	65.0	± 9.6 %
		Y	30.42	107.23	31.48		65.0	
		Z	25.26	102.15	28.17		65.0	

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10239-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	64.82	118.13	33.68	6.02	65.0	± 9.6 %
		Y	25.62	102.71	29.84		65.0	
		Z	19.45	96.40	25.90		65.0	
10240-CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	75.84	131.04	39.71	6.02	65.0	± 9.6 %
		Y	25.37	109.88	34.14		65.0	
		Z	13.84	97.74	29.11		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	12.34	87.77	28.08	6.98	65.0	± 9.6 %
		Y	10.01	84.69	26.80		65.0	
		Z	9.45	83.27	25.94		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	11.90	86.96	27.88	6.98	65.0	± 9.6 %
		Y	9.43	82.13	25.70		65.0	
		Z	8.88	82.07	24.81		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	9.29	83.62	27.37	6.98	65.0	± 9.6 %
		Y	7.60	79.19	25.41		65.0	
		Z	6.90	78.26	24.23		65.0	
10244-CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	11.62	86.25	22.86	3.98	65.0	± 9.6 %
		Y	9.03	81.02	21.07		65.0	
		Z	5.90	74.19	17.01		65.0	
10245-CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	11.21	84.37	22.69	3.98	65.0	± 9.6 %
		Y	8.74	80.23	20.72		65.0	
		Z	5.76	73.60	16.72		65.0	
10246-CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	13.76	91.33	25.01	3.98	65.0	± 9.6 %
		Y	8.27	82.60	21.35		65.0	
		Z	5.24	75.79	17.95		65.0	
10247-CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	8.15	80.38	21.81	3.98	65.0	± 9.6 %
		Y	6.57	76.53	18.78		65.0	
		Z	5.10	72.95	17.62		65.0	
10248-CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	7.98	79.46	21.43	3.98	65.0	± 9.6 %
		Y	6.50	75.86	19.49		65.0	
		Z	5.09	72.45	17.30		65.0	
10249-CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	14.67	92.89	26.21	3.98	65.0	± 9.6 %
		Y	9.72	85.51	23.23		65.0	
		Z	6.59	79.52	20.29		65.0	
10250-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	8.79	81.74	23.60	3.98	65.0	± 9.6 %
		Y	7.53	78.89	22.19		65.0	
		Z	6.20	76.02	20.42		65.0	
10251-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	8.02	78.77	22.12	3.98	65.0	± 9.6 %
		Y	7.01	76.36	20.84		65.0	
		Z	5.89	73.77	19.14		65.0	
10252-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	12.21	89.16	25.88	3.98	65.0	± 9.6 %
		Y	8.34	84.33	23.66		65.0	
		Z	7.06	80.06	21.48		65.0	
10253-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	7.75	77.29	21.77	3.98	65.0	± 9.6 %
		Y	6.83	75.28	20.72		65.0	
		Z	5.92	73.10	19.25		65.0	
10254-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	8.16	78.13	22.42	3.98	65.0	± 9.6 %
		Y	7.34	76.22	21.42		65.0	
		Z	6.32	74.11	19.99		65.0	

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10255-CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	9.52	82.96	23.60	3.98	65.0	± 9.6 %
		Y	8.03	79.93	22.27		65.0	
		Z	6.80	77.07	20.60		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	10.25	82.65	21.18	3.98	65.0	± 9.6 %
		Y	7.42	77.45	18.77		65.0	
		Z	4.37	69.73	14.06		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	9.67	81.35	20.60	3.98	65.0	± 9.6 %
		Y	7.07	76.38	18.24		65.0	
		Z	4.27	69.13	13.71		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	11.24	87.41	23.08	3.98	65.0	± 9.6 %
		Y	8.32	77.82	18.86		65.0	
		Z	3.88	71.16	15.20		65.0	
10259-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	8.37	80.75	22.38	3.98	65.0	± 9.6 %
		Y	6.95	77.37	20.63		65.0	
		Z	5.53	74.09	18.50		65.0	
10260-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	8.31	80.29	22.23	3.98	65.0	± 9.6 %
		Y	6.94	77.04	20.51		65.0	
		Z	5.55	73.86	18.49		65.0	
10261-CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	12.47	89.95	25.58	3.98	65.0	± 9.6 %
		Y	9.00	84.05	23.10		65.0	
		Z	6.47	78.99	20.51		65.0	
10262-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	8.78	81.69	23.56	3.98	65.0	± 9.6 %
		Y	7.52	78.83	22.15		65.0	
		Z	6.19	75.95	20.38		65.0	
10263-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	8.01	78.76	22.12	3.98	65.0	± 9.6 %
		Y	7.00	76.35	20.63		65.0	
		Z	5.82	73.75	19.13		65.0	
10264-CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	12.07	88.92	25.56	3.98	65.0	± 9.6 %
		Y	8.25	84.11	23.56		65.0	
		Z	7.01	79.85	21.36		65.0	
10265-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	8.04	78.09	22.05	3.98	65.0	± 9.6 %
		Y	7.13	75.81	20.07		65.0	
		Z	6.04	73.58	19.44		65.0	
10266-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	8.44	78.91	22.74	3.98	65.0	± 9.6 %
		Y	7.56	76.88	21.73		65.0	
		Z	6.47	74.69	20.29		65.0	
10267-CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	10.11	83.73	23.66	3.98	65.0	± 9.6 %
		Y	8.41	80.47	22.25		65.0	
		Z	6.87	77.57	20.57		65.0	
10268-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	8.39	77.19	22.02	3.98	65.0	± 9.6 %
		Y	7.65	75.61	21.20		65.0	
		Z	6.70	73.67	19.92		65.0	
10269-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	8.28	76.63	21.88	3.98	65.0	± 9.0 %
		Y	7.58	75.05	21.07		65.0	
		Z	6.67	73.30	19.83		65.0	
10270-CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	8.88	79.53	22.20	3.98	65.0	± 9.6 %
		Y	7.84	77.34	21.20		65.0	
		Z	6.74	75.30	19.86		65.0	

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10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.69	67.00	15.83	0.00	150.0	± 9.6 %
		Y	2.47	65.61	14.87		150.0	
		Z	2.60	67.27	15.58		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.83	70.14	16.96	0.00	150.0	± 9.6 %
		Y	1.44	66.20	14.31		150.0	
		Z	1.70	69.74	16.44		150.0	
10277-CAA	PHS (QPSK)	X	3.93	66.44	11.36	9.03	50.0	± 9.6 %
		Y	3.47	64.75	10.20		50.0	
		Z	2.62	62.17	7.82		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	14.62	89.25	23.47	9.03	50.0	± 9.6 %
		Y	7.61	76.00	18.87		50.0	
		Z	4.20	69.20	13.78		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	14.85	89.41	23.56	9.03	50.0	± 9.6 %
		Y	7.77	76.24	18.99		50.0	
		Z	4.39	69.44	13.93		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	2.10	73.72	17.06	0.00	150.0	± 9.6 %
		Y	1.30	65.83	12.24		150.0	
		Z	1.79	72.49	15.56		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	1.16	70.51	15.66	0.00	150.0	± 9.6 %
		Y	0.67	63.17	10.49		150.0	
		Z	0.94	68.71	13.80		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	1.93	78.24	19.72	0.00	150.0	± 9.6 %
		Y	0.76	65.41	12.01		150.0	
		Z	2.01	80.04	18.65		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	4.24	91.88	24.62	0.00	150.0	± 9.6 %
		Y	0.99	68.94	14.19		150.0	
		Z	16.88	110.82	28.51		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	12.27	89.66	26.50	9.03	50.0	± 9.6 %
		Y	10.64	85.72	24.40		50.0	
		Z	6.99	77.74	20.11		50.0	
10297-AAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	3.09	71.44	17.51	0.00	150.0	± 9.6 %
		Y	2.59	68.47	15.73		150.0	
		Z	2.87	71.14	17.24		150.0	
10298-AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	2.03	71.15	16.52	0.00	150.0	± 9.6 %
		Y	1.39	65.75	12.91		150.0	
		Z	1.75	70.22	15.26		150.0	
10299-AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	4.66	77.12	18.36	0.00	150.0	± 9.6 %
		Y	3.14	71.60	15.64		150.0	
		Z	3.76	74.00	15.70		150.0	
10300-AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	2.97	69.66	14.52	0.00	150.0	± 9.6 %
		Y	2.26	66.25	12.46		150.0	
		Z	2.17	66.32	11.62		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	6.32	66.98	18.38	4.17	50.0	± 9.6 %
		Y	6.22	66.80	18.11		50.0	
		Z	4.67	65.61	17.58		50.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	5.74	67.34	18.93	4.96	50.0	± 9.6 %
		Y	5.58	66.87	18.46		50.0	
		Z	5.16	66.25	18.09		50.0	

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10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	5.54	67.22	18.91	4.96	50.0	± 9.6 %
		Y	5.37	66.70	18.39		50.0	
		Z	4.93	65.95	17.95		50.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	5.28	66.83	18.25	4.17	50.0	± 9.6 %
		Y	5.10	66.29	17.74		50.0	
		Z	4.73	65.82	17.46		50.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	5.67	72.27	22.34	6.02	35.0	± 9.6 %
		Y	5.72	72.46	21.90		35.0	
		Z	4.66	68.90	20.05		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	5.47	68.37	20.21	6.02	35.0	± 9.6 %
		Y	5.52	69.50	20.64		35.0	
		Z	4.82	67.24	19.32		35.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	5.58	70.12	21.19	6.02	35.0	± 9.6 %
		Y	5.54	70.11	20.79		35.0	
		Z	4.75	67.57	19.37		35.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	5.58	70.46	21.39	6.02	35.0	± 9.6 %
		Y	5.56	70.49	21.00		35.0	
		Z	4.74	67.84	19.54		35.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	5.56	68.68	20.38	6.02	35.0	± 9.6 %
		Y	5.61	69.80	20.81		35.0	
		Z	4.87	67.43	19.45		35.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	5.54	69.67	21.04	6.02	35.0	± 9.6 %
		Y	5.51	69.73	20.68		35.0	
		Z	4.78	67.38	19.33		35.0	
10311-AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.47	70.67	17.10	0.00	150.0	± 9.6 %
		Y	2.93	67.81	15.46		150.0	
		Z	3.26	70.40	16.86		150.0	
10313-AAA	iDEN 1:3	X	10.55	84.71	20.54	6.99	70.0	± 9.6 %
		Y	5.52	75.51	16.93		70.0	
		Z	3.35	69.99	14.11		70.0	
10314-AAA	iDEN 1:6	X	24.93	102.67	28.79	10.00	30.0	± 9.6 %
		Y	8.40	84.46	22.81		30.0	
		Z	4.59	75.67	18.98		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.16	65.40	16.44	0.17	150.0	± 9.6 %
		Y	1.01	63.11	14.44		150.0	
		Z	1.08	64.77	15.73		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.72	66.92	16.53	0.17	150.0	± 9.6 %
		Y	4.56	66.38	16.12		150.0	
		Z	4.51	66.86	16.22		150.0	
10317-AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.72	66.92	16.53	0.17	150.0	± 9.6 %
		Y	4.56	66.38	16.12		150.0	
		Z	4.51	66.86	16.22		150.0	
10400-AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.84	67.20	16.45	0.00	150.0	± 9.6 %
		Y	4.66	66.61	16.02		150.0	
		Z	4.63	67.25	16.26		150.0	
10401-AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.46	67.20	16.49	0.00	150.0	± 9.6 %
		Y	5.35	66.85	16.23		150.0	
		Z	5.28	67.24	16.32		150.0	

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10402-AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.76	67.76	16.80	0.00	150.0	± 9.6 %
		Y	5.61	67.21	16.26		150.0	
		Z	5.57	67.70	16.42		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	2.10	73.72	17.06	0.00	115.0	± 9.6 %
		Y	1.20	65.83	12.24		115.0	
		Z	1.79	72.49	15.56		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	2.10	73.72	17.06	0.00	115.0	± 9.6 %
		Y	1.20	65.83	12.24		115.0	
		Z	1.79	72.49	15.56		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	122.19	31.29	0.00	100.0	± 9.6 %
		Y	29.24	105.80	27.50		100.0	
		Z	100.00	114.73	27.11		100.0	
10410-AAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	X	100.00	121.06	30.81	3.23	80.0	± 9.6 %
		Y	100.00	121.88	31.03		80.0	
		Z	83.71	111.58	25.89		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.02	63.90	15.54	0.00	150.0	± 9.6 %
		Y	0.91	61.92	13.65		150.0	
		Z	0.99	63.88	15.24		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.84	66.82	16.39	0.00	150.0	± 9.6 %
		Y	4.48	66.26	15.97		150.0	
		Z	4.48	66.96	16.25		150.0	
10417-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.84	66.82	16.39	0.00	150.0	± 9.6 %
		Y	4.48	66.26	15.97		150.0	
		Z	4.48	66.96	16.25		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.63	66.97	16.41	0.00	150.0	± 9.6 %
		Y	4.47	66.40	15.97		150.0	
		Z	4.47	67.14	16.29		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.65	66.92	16.41	0.00	150.0	± 9.6 %
		Y	4.49	66.36	15.96		150.0	
		Z	4.49	67.06	16.28		150.0	
10422-AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.78	66.82	16.42	0.00	150.0	± 9.6 %
		Y	4.61	66.37	16.01		150.0	
		Z	4.61	67.05	16.28		150.0	
10423-AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.98	67.28	16.58	0.00	150.0	± 9.6 %
		Y	4.79	66.71	16.13		150.0	
		Z	4.77	67.36	16.39		150.0	
10424-AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.88	67.24	16.52	0.00	150.0	± 9.6 %
		Y	4.70	66.65	16.10		150.0	
		Z	4.69	67.32	16.37		150.0	
10425-AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.44	67.47	16.62	0.00	150.0	± 9.6 %
		Y	5.32	67.05	16.33		150.0	
		Z	5.25	67.48	16.46		150.0	
10426-AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.45	67.50	16.63	0.00	150.0	± 9.6 %
		Y	5.32	67.06	16.33		150.0	
		Z	5.26	67.50	16.46		150.0	

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10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.47	67.62	16.63	0.00	150.0	± 9.6 %
		Y	5.33	67.04	16.31		150.0	
		Z	5.28	67.50	16.46		150.0	
10430-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.44	70.94	18.69	0.00	150.0	± 9.6 %
		Y	4.14	70.00	17.76		150.0	
		Z	4.53	72.71	19.04		150.0	
10431-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.38	67.45	16.50	0.00	150.0	± 9.6 %
		Y	4.17	66.74	15.93		150.0	
		Z	4.18	67.60	16.31		150.0	
10432-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.67	67.30	16.51	0.00	150.0	± 9.6 %
		Y	4.47	66.68	16.03		150.0	
		Z	4.47	67.41	16.34		150.0	
10433-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.90	67.28	16.55	0.00	150.0	± 9.6 %
		Y	4.72	66.69	16.12		150.0	
		Z	4.71	67.36	16.39		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.58	71.86	18.83	0.00	150.0	± 9.6 %
		Y	4.21	70.69	17.87		150.0	
		Z	4.78	74.08	19.21		150.0	
10435-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	120.88	30.73	3.23	80.0	± 9.6 %
		Y	100.00	121.69	30.95		80.0	
		Z	66.38	108.66	25.18		80.0	
10447-AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.72	67.65	16.10	0.00	150.0	± 9.6 %
		Y	3.44	66.58	15.18		150.0	
		Z	3.50	67.81	15.74		150.0	
10448-AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.21	67.23	16.37	0.00	150.0	± 9.6 %
		Y	4.00	66.50	15.77		150.0	
		Z	4.02	67.40	16.18		150.0	
10449-AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.46	67.14	16.42	0.00	150.0	± 9.6 %
		Y	4.27	66.48	15.91		150.0	
		Z	4.28	67.27	16.26		150.0	
10450-AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.64	67.06	16.42	0.00	150.0	± 9.6 %
		Y	4.47	66.43	15.96		150.0	
		Z	4.47	67.16	16.26		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.66	68.00	15.89	0.00	150.0	± 9.6 %
		Y	3.33	66.69	14.77		150.0	
		Z	3.40	68.06	15.28		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.29	68.08	16.78	0.00	150.0	± 9.6 %
		Y	6.17	67.63	16.50		150.0	
		Z	6.11	68.01	16.68		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.83	66.45	16.13	0.00	150.0	± 9.6 %
		Y	3.72	64.89	15.67		150.0	
		Z	3.74	65.60	15.96		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	4.16	70.93	18.07	0.00	150.0	± 9.6 %
		Y	3.83	69.00	17.01		150.0	
		Z	4.26	73.12	18.49		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.20	68.00	18.25	0.00	150.0	± 9.6 %
		Y	5.01	67.77	17.91		150.0	
		Z	5.25	69.86	18.70		150.0	

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10460-AAA	UMTS-FDD (WCDMA, AMR)	X	1.12	72.77	16.83	0.00	150.0	± 9.6 %
		Y	0.73	65.44	13.95		150.0	
		Z	1.01	71.76	18.00		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	126.43	33.83	3.25	80.0	± 9.6 %
		Y	100.00	125.87	32.93		80.0	
		Z	90.37	116.03	27.82		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.88	25.50	3.23	80.0	± 9.6 %
		Y	100.00	109.45	25.26		80.0	
		Z	1.10	60.79	7.66		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.70	24.02	3.23	80.0	± 9.6 %
		Y	45.13	98.79	22.03		80.0	
		Z	1.03	60.00	7.05		80.0	
10464-AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	124.44	32.24	3.23	80.0	± 9.6 %
		Y	100.00	123.71	31.77		80.0	
		Z	25.88	98.94	23.07		80.0	
10465-AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.41	25.30	3.23	80.0	± 9.6 %
		Y	100.00	108.89	24.99		80.0	
		Z	1.05	60.34	7.60		80.0	
10466-AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.17	23.77	3.23	80.0	± 9.6 %
		Y	17.42	87.73	19.16		80.0	
		Z	1.03	60.00	7.00		80.0	
10467-AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	124.87	32.33	3.23	80.0	± 9.6 %
		Y	100.00	123.85	31.88		80.0	
		Z	34.96	102.47	23.96		80.0	
10468-AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.58	25.38	3.23	80.0	± 9.6 %
		Y	100.00	109.06	25.07		80.0	
		Z	1.06	60.45	7.67		80.0	
10469-AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.16	23.77	3.23	80.0	± 9.6 %
		Y	18.04	88.11	19.26		80.0	
		Z	1.03	60.00	7.00		80.0	
10470-AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	124.71	32.35	3.23	80.0	± 9.6 %
		Y	100.00	123.88	31.88		80.0	
		Z	35.24	102.56	23.97		80.0	
10471-AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.53	25.35	3.23	80.0	± 9.6 %
		Y	100.00	109.01	25.04		80.0	
		Z	1.05	60.40	7.64		80.0	
10472-AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.13	23.74	3.23	80.0	± 9.6 %
		Y	17.90	88.00	19.21		80.0	
		Z	1.03	60.00	8.09		90.0	
10473-AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	124.67	32.34	3.23	80.0	± 9.6 %
		Y	100.00	123.85	31.87		80.0	
		Z	34.67	102.54	23.91		80.0	
10474-AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.54	25.35	3.23	80.0	± 9.6 %
		Y	100.00	109.01	25.04		80.0	
		Z	1.05	60.39	7.63		80.0	
10475-AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.14	23.74	3.23	80.0	± 9.6 %
		Y	17.52	87.78	19.16		80.0	
		Z	1.03	60.00	6.95		80.0	

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10477-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.37	25.27	3.23	80.0	± 9.6 %
		Y	100.00	108.84	24.96		80.0	
		Z	1.00	80.28	7.55		80.0	
10478-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.29	23.72	3.23	80.0	± 9.6 %
		Y	17.03	87.46	19.06		80.0	
		Z	1.03	80.00	6.98		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	32.47	108.40	30.35	3.23	80.0	± 9.6 %
		Y	23.42	102.36	28.38		80.0	
		Z	8.33	85.84	21.97		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	42.90	105.02	27.50	3.23	80.0	± 9.6 %
		Y	20.70	94.12	24.14		80.0	
		Z	6.08	76.74	17.00		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	32.83	100.01	25.80	3.23	80.0	± 9.6 %
		Y	15.07	89.36	22.38		80.0	
		Z	4.46	72.49	15.13		80.0	
10482-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.28	87.36	23.04	2.23	80.0	± 9.6 %
		Y	3.94	74.35	17.65		80.0	
		Z	2.70	70.00	15.33		80.0	
10483-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	15.24	90.75	23.81	2.23	80.0	± 9.6 %
		Y	9.76	83.78	21.08		80.0	
		Z	3.87	71.04	15.18		80.0	
10484-AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	12.87	88.08	23.00	2.23	80.0	± 9.6 %
		Y	8.49	81.59	20.36		80.0	
		Z	3.68	70.14	14.84		80.0	
10485-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.98	85.70	23.28	2.23	80.0	± 9.6 %
		Y	4.38	75.94	19.15		80.0	
		Z	3.22	72.33	17.26		80.0	
10486-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.38	76.17	19.55	2.23	80.0	± 9.6 %
		Y	3.79	70.74	16.72		80.0	
		Z	3.08	68.57	15.26		80.0	
10487-AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.22	75.40	19.28	2.23	80.0	± 9.6 %
		Y	3.77	70.31	16.54		80.0	
		Z	3.09	68.23	15.10		80.0	
10488-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.58	81.06	22.14	2.23	80.0	± 9.6 %
		Y	4.49	74.73	19.35		80.0	
		Z	3.66	72.12	17.94		80.0	
10489-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.86	73.47	19.42	2.23	80.0	± 9.6 %
		Y	4.01	70.32	17.71		80.0	
		Z	3.48	68.92	16.70		80.0	
10490-AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.86	72.95	19.23	2.23	80.0	± 9.6 %
		Y	4.10	70.05	17.64		80.0	
		Z	3.57	68.77	16.66		80.0	
10491-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	5.95	76.95	20.70	2.23	80.0	± 9.6 %
		Y	4.52	72.66	18.69		80.0	
		Z	3.82	70.84	17.60		80.0	
10492-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.84	71.68	18.90	2.23	80.0	± 9.6 %
		Y	4.31	69.40	17.83		80.0	
		Z	3.83	68.32	16.79		80.0	

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10493-AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.97	71.38	18.79	2.23	80.0	± 9.6 %
		Y	4.37	69.24	17.58		80.0	
		Z	3.90	68.20	16.76		80.0	
10494-AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.95	79.86	21.50	2.23	80.0	± 9.6 %
		Y	4.99	74.37	19.18		80.0	
		Z	4.13	72.26	18.02		80.0	
10495-AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.07	72.38	19.10	2.23	80.0	± 9.6 %
		Y	4.37	69.87	17.84		80.0	
		Z	3.87	68.70	16.88		80.0	
10496-AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.07	71.80	18.98	2.23	80.0	± 9.6 %
		Y	4.43	69.53	17.74		80.0	
		Z	3.96	68.45	16.92		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.77	64.28	21.25	2.23	80.0	± 9.6 %
		Y	2.76	69.51	14.83		80.0	
		Z	1.83	65.26	12.27		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.10	72.22	15.94	2.23	80.0	± 9.6 %
		Y	2.08	63.53	11.20		80.0	
		Z	1.49	60.84	9.11		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.88	71.14	15.38	2.23	80.0	± 9.6 %
		Y	2.02	62.98	10.80		80.0	
		Z	1.45	60.40	8.75		80.0	
10500-AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.65	82.59	22.44	2.23	80.0	± 9.6 %
		Y	4.30	75.01	19.09		80.0	
		Z	3.32	71.99	17.46		80.0	
10501-AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.08	74.80	19.39	2.23	80.0	± 9.6 %
		Y	3.90	70.69	17.11		80.0	
		Z	3.27	68.63	15.87		80.0	
10502-AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.08	74.42	19.19	2.23	80.0	± 9.6 %
		Y	3.94	70.38	16.98		80.0	
		Z	3.32	68.68	15.78		80.0	
10503-AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.47	80.76	22.03	2.23	80.0	± 9.6 %
		Y	4.42	74.51	19.24		80.0	
		Z	3.53	71.90	17.84		80.0	
10504-AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.84	73.36	19.37	2.23	80.0	± 9.6 %
		Y	3.59	70.22	17.65		80.0	
		Z	3.46	68.82	16.64		80.0	
10505-AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.85	72.84	19.17	2.23	80.0	± 9.6 %
		Y	4.07	69.98	17.58		80.0	
		Z	3.55	68.67	16.80		80.0	
10506-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.87	79.65	21.49	2.23	80.0	± 9.6 %
		Y	4.94	74.20	19.10		80.0	
		Z	4.10	72.10	17.94		80.0	
10507-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.05	72.32	19.14	2.23	80.0	± 9.6 %
		Y	4.35	69.81	17.80		80.0	
		Z	3.85	68.63	16.94		80.0	

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10508-AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.05	71.72	18.93	2.23	80.0	± 9.6 %
		Y	4.41	69.46	17.70		80.0	
		Z	3.93	68.38	16.87		80.0	
10509-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.42	76.31	20.23	2.23	80.0	± 9.6 %
		Y	5.10	72.45	18.45		80.0	
		Z	4.44	71.04	17.56		80.0	
10510-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.41	71.43	18.82	2.23	80.0	± 9.6 %
		Y	4.81	69.39	17.73		80.0	
		Z	4.34	68.44	16.99		80.0	
10511-AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.40	70.96	18.67	2.23	80.0	± 9.6 %
		Y	4.84	69.09	17.65		80.0	
		Z	4.39	68.21	16.94		80.0	
10512-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.47	79.47	21.24	2.23	80.0	± 9.6 %
		Y	5.46	74.25	18.99		80.0	
		Z	4.64	72.47	17.97		80.0	
10513-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.39	72.08	19.07	2.23	80.0	± 9.6 %
		Y	4.72	69.76	17.86		80.0	
		Z	4.23	68.69	17.07		80.0	
10514-AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.30	71.34	18.83	2.23	80.0	± 9.6 %
		Y	4.71	69.27	17.73		80.0	
		Z	4.25	68.30	16.97		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.99	64.18	15.67	0.00	150.0	± 9.6 %
		Y	0.87	62.03	13.65		150.0	
		Z	0.96	64.13	15.35		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	1.07	82.62	23.29	0.00	150.0	± 9.6 %
		Y	0.42	66.18	13.67		150.0	
		Z	0.79	78.03	21.08		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.89	67.34	17.01	0.00	150.0	± 9.6 %
		Y	0.70	63.35	13.75		150.0	
		Z	0.83	66.82	16.43		150.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.64	66.90	16.38	0.00	150.0	± 9.6 %
		Y	4.47	66.33	15.94		150.0	
		Z	4.47	67.04	16.24		150.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.85	67.18	16.51	0.00	150.0	± 9.6 %
		Y	4.67	66.59	16.08		150.0	
		Z	4.65	67.25	16.34		150.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.71	67.17	16.45	0.00	150.0	± 9.6 %
		Y	4.52	66.54	15.99		150.0	
		Z	4.51	67.23	16.28		150.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.64	67.19	16.44	0.00	150.0	± 9.6 %
		Y	4.45	66.53	15.97		150.0	
		Z	4.44	67.24	16.27		150.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.69	67.17	16.48	0.00	150.0	± 9.6 %
		Y	4.51	66.60	16.04		150.0	
		Z	4.50	67.33	16.35		150.0	

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10523-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.56	67.00	16.34	0.00	150.0	± 9.6 %
		Y	4.38	66.45	15.88		150.0	
		Z	4.39	67.23	16.22		150.0	
10524-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.64	67.13	16.46	0.00	150.0	± 9.6 %
		Y	4.45	66.52	16.01		150.0	
		Z	4.44	67.24	16.32		150.0	
10525-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.60	66.17	16.06	0.00	150.0	± 9.6 %
		Y	4.43	65.55	15.60		150.0	
		Z	4.44	66.33	15.94		150.0	
10526-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.80	66.57	16.20	0.00	150.0	± 9.6 %
		Y	4.60	65.93	15.75		150.0	
		Z	4.61	66.68	16.07		150.0	
10527-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.72	66.55	16.16	0.00	150.0	± 9.6 %
		Y	4.52	65.88	15.69		150.0	
		Z	4.53	66.66	16.02		150.0	
10528-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.73	66.57	16.19	0.00	150.0	± 9.6 %
		Y	4.54	65.90	15.72		150.0	
		Z	4.55	66.67	16.05		150.0	
10529-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.73	66.57	16.19	0.00	150.0	± 9.6 %
		Y	4.54	65.90	15.72		150.0	
		Z	4.55	66.67	16.05		150.0	
10531-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.74	66.72	16.22	0.00	150.0	± 9.6 %
		Y	4.53	66.01	15.73		150.0	
		Z	4.53	66.77	16.06		150.0	
10532-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.60	66.59	16.17	0.00	150.0	± 9.6 %
		Y	4.39	65.86	15.66		150.0	
		Z	4.40	66.64	16.01		150.0	
10533-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.75	66.60	16.17	0.00	150.0	± 9.6 %
		Y	4.55	65.94	15.70		150.0	
		Z	4.56	66.73	16.05		150.0	
10534-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.24	66.67	16.21	0.00	150.0	± 9.6 %
		Y	5.08	66.08	15.82		150.0	
		Z	5.06	66.70	16.06		150.0	
10535-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.31	66.61	16.26	0.00	150.0	± 9.6 %
		Y	5.14	66.24	15.89		150.0	
		Z	5.12	66.86	16.13		150.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.13	66.81	16.25	0.00	150.0	± 9.6 %
		Y	5.01	66.19	15.84		150.0	
		Z	5.00	66.94	16.11		150.0	
10537-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.24	66.77	16.23	0.00	150.0	± 9.6 %
		Y	5.07	66.17	15.84		150.0	
		Z	5.06	66.79	16.08		150.0	
10538-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.35	66.82	16.29	0.00	150.0	± 9.6 %
		Y	5.17	66.21	15.90		150.0	
		Z	5.14	66.79	16.12		150.0	
10540-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.25	66.76	16.29	0.00	150.0	± 9.6 %
		Y	5.09	66.21	15.91		150.0	
		Z	5.07	66.78	16.13		150.0	

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10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.24	66.69	16.24	0.00	150.0	± 9.6 %
		Y	5.06	66.08	15.84		150.0	
		Z	5.05	66.69	16.08		150.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.30	66.72	16.27	0.00	150.0	± 9.6 %
		Y	5.22	66.16	15.90		150.0	
		Z	5.20	66.74	16.12		150.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.47	66.74	16.29	0.00	150.0	± 9.6 %
		Y	5.30	66.21	15.95		150.0	
		Z	5.27	66.76	16.14		150.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.52	66.77	16.19	0.00	150.0	± 9.6 %
		Y	5.38	66.20	15.82		150.0	
		Z	5.37	66.80	16.04		150.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.72	67.14	16.31	0.00	150.0	± 9.6 %
		Y	5.56	66.63	15.99		150.0	
		Z	5.53	67.12	16.15		150.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.61	67.04	16.28	0.00	150.0	± 9.6 %
		Y	5.45	66.44	15.91		150.0	
		Z	5.43	66.99	16.10		150.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.70	67.12	16.31	0.00	150.0	± 9.6 %
		Y	5.53	66.49	15.92		150.0	
		Z	5.50	67.02	16.11		150.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.93	67.96	16.70	0.00	150.0	± 9.6 %
		Y	5.82	67.53	16.41		150.0	
		Z	5.64	67.63	16.39		150.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.63	67.00	16.27	0.00	150.0	± 9.6 %
		Y	5.47	66.43	15.91		150.0	
		Z	5.45	67.00	16.12		150.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.65	67.07	16.26	0.00	150.0	± 9.6 %
		Y	5.48	66.48	15.89		150.0	
		Z	5.46	67.04	16.10		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.55	66.86	16.18	0.00	150.0	± 9.6 %
		Y	5.39	66.26	15.80		150.0	
		Z	5.39	66.89	16.04		150.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.65	66.91	16.22	0.00	150.0	± 9.6 %
		Y	5.48	66.32	15.86		150.0	
		Z	5.47	66.91	16.07		150.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.92	67.13	16.27	0.00	150.0	± 9.6 %
		Y	5.78	66.58	15.93		150.0	
		Z	5.77	67.13	16.11		150.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.06	67.44	16.39	0.00	150.0	± 9.6 %
		Y	5.92	66.89	16.06		150.0	
		Z	5.88	67.38	16.21		150.0	
10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.07	67.47	16.40	0.00	150.0	± 9.6 %
		Y	5.94	66.94	16.07		150.0	
		Z	5.90	67.42	16.23		150.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.06	67.43	16.40	0.00	150.0	± 9.6 %
		Y	5.91	66.85	16.05		150.0	
		Z	5.87	67.38	16.22		150.0	

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10558-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	5.11	67.60	16.50	0.00	150.0	± 9.6 %
		Y	5.96	67.02	16.15		150.0	
		Z	5.91	67.50	16.30		150.0	
10560-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	6.11	67.46	16.47	0.00	150.0	± 9.6 %
		Y	5.96	66.87	16.11		150.0	
		Z	5.92	67.38	16.28		150.0	
10561-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	6.02	67.40	16.48	0.00	150.0	± 9.6 %
		Y	5.87	66.84	16.13		150.0	
		Z	5.84	67.33	16.29		150.0	
10562-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.16	67.82	16.69	0.00	150.0	± 9.6 %
		Y	6.01	67.26	16.35		150.0	
		Z	5.93	67.63	16.44		150.0	
10563-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	6.47	68.29	16.80	0.00	150.0	± 9.6 %
		Y	6.34	67.82	16.58		150.0	
		Z	6.09	67.70	16.43		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.97	66.98	16.53	0.46	150.0	± 9.6 %
		Y	4.81	66.46	16.14		150.0	
		Z	4.78	67.02	16.32		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.23	67.46	16.85	0.46	150.0	± 9.6 %
		Y	5.05	66.93	16.47		150.0	
		Z	5.01	67.49	16.66		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	5.06	67.34	16.69	0.46	150.0	± 9.6 %
		Y	4.88	66.77	16.28		150.0	
		Z	4.84	67.32	16.46		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	5.09	67.74	17.04	0.46	150.0	± 9.6 %
		Y	4.91	67.15	16.63		150.0	
		Z	4.85	67.60	16.87		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.97	67.07	16.45	0.46	150.0	± 9.6 %
		Y	4.80	66.54	16.06		150.0	
		Z	4.74	67.03	16.19		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	5.03	67.78	17.08	0.46	150.0	± 9.6 %
		Y	4.86	67.22	16.68		150.0	
		Z	4.85	67.93	16.95		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	5.06	67.62	17.01	0.46	150.0	± 9.6 %
		Y	4.90	67.08	16.62		150.0	
		Z	4.86	67.73	16.86		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.32	66.77	17.12	0.46	130.0	± 9.6 %
		Y	1.14	64.23	15.06		130.0	
		Z	1.17	65.20	15.88		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.36	67.60	17.59	0.46	130.0	± 9.6 %
		Y	1.16	64.80	15.38		130.0	
		Z	1.19	65.98	16.20		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	100.00	150.25	40.35	0.46	130.0	± 9.6 %
		Y	1.94	81.80	20.21		130.0	
		Z	5.37	101.40	27.76		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.80	77.53	22.17	0.46	130.0	± 9.6 %
		Y	1.28	70.31	17.98		130.0	
		Z	1.45	73.83	20.12		130.0	

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10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.77	66.82	16.63	0.46	130.0	± 9.6 %
		Y	4.62	66.32	16.23		130.0	
		Z	4.56	66.75	16.29		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.80	66.99	16.69	0.46	130.0	± 9.6 %
		Y	4.64	66.47	16.29		130.0	
		Z	4.59	66.94	16.38		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	5.03	67.31	16.86	0.46	130.0	± 9.6 %
		Y	4.85	66.78	16.47		130.0	
		Z	4.78	67.21	16.54		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.93	67.50	16.98	0.46	130.0	± 9.6 %
		Y	4.75	66.94	16.57		130.0	
		Z	4.69	67.42	16.68		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.69	66.84	16.33	0.46	130.0	± 9.6 %
		Y	4.52	66.24	15.89		130.0	
		Z	4.43	66.57	15.89		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.74	66.81	16.32	0.46	130.0	± 9.6 %
		Y	4.57	66.26	15.90		130.0	
		Z	4.47	66.59	15.90		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.83	67.59	16.95	0.46	130.0	± 9.6 %
		Y	4.65	66.98	16.51		130.0	
		Z	4.59	67.47	16.62		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.64	66.58	16.12	0.46	130.0	± 9.6 %
		Y	4.47	66.00	15.67		130.0	
		Z	4.36	66.28	15.65		130.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.77	66.82	16.63	0.46	130.0	± 9.6 %
		Y	4.62	66.32	16.23		130.0	
		Z	4.56	66.75	16.29		130.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.80	66.99	16.69	0.46	130.0	± 9.6 %
		Y	4.64	66.47	16.29		130.0	
		Z	4.59	66.94	16.38		130.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	5.03	67.31	16.86	0.46	130.0	± 9.6 %
		Y	4.85	66.78	16.47		130.0	
		Z	4.78	67.21	16.54		130.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.93	67.50	16.98	0.46	130.0	± 9.6 %
		Y	4.75	66.94	16.57		130.0	
		Z	4.69	67.42	16.68		130.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.69	66.84	16.33	0.46	130.0	± 9.6 %
		Y	4.52	66.24	15.89		130.0	
		Z	4.43	66.57	15.89		130.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.74	66.81	16.32	0.46	130.0	± 9.6 %
		Y	4.57	66.26	15.90		130.0	
		Z	4.47	66.59	15.90		130.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.83	67.59	16.95	0.46	130.0	± 9.6 %
		Y	4.65	66.98	16.51		130.0	
		Z	4.59	67.47	16.62		130.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.64	66.58	16.12	0.46	130.0	± 9.6 %
		Y	4.47	66.00	15.67		130.0	
		Z	4.36	66.28	15.65		130.0	

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10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.82	66.87	16.71	0.46	130.0	± 9.6 %
		Y	4.77	66.38	16.34		130.0	
		Z	4.71	66.82	16.40		130.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	5.08	67.22	16.84	0.46	130.0	± 9.6 %
		Y	4.93	66.72	16.47		130.0	
		Z	4.86	67.15	16.53		130.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	5.02	67.17	16.74	0.46	130.0	± 9.6 %
		Y	4.85	66.64	16.36		130.0	
		Z	4.77	67.04	16.40		130.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	5.07	67.32	16.89	0.46	130.0	± 9.6 %
		Y	4.90	66.80	16.51		130.0	
		Z	4.83	67.23	16.57		130.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	5.05	67.28	16.79	0.46	130.0	± 9.6 %
		Y	4.87	66.75	16.40		130.0	
		Z	4.80	67.17	16.45		130.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.98	67.29	16.80	0.46	130.0	± 9.6 %
		Y	4.81	66.75	16.40		130.0	
		Z	4.73	67.16	16.45		130.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.94	67.23	16.70	0.46	130.0	± 9.6 %
		Y	4.76	66.66	16.29		130.0	
		Z	4.68	67.05	16.33		130.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.92	67.49	16.98	0.46	130.0	± 9.6 %
		Y	4.74	66.90	16.55		130.0	
		Z	4.68	67.34	16.63		130.0	
10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.58	67.43	16.88	0.46	130.0	± 9.6 %
		Y	5.44	66.96	16.56		130.0	
		Z	5.34	67.25	16.55		130.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.74	67.88	17.07	0.46	130.0	± 9.6 %
		Y	5.60	67.47	16.79		130.0	
		Z	5.43	67.51	16.64		130.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.61	67.61	16.95	0.46	130.0	± 9.6 %
		Y	5.48	67.17	16.66		130.0	
		Z	5.35	67.37	16.60		130.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.70	67.58	16.86	0.46	130.0	± 9.6 %
		Y	5.56	67.17	16.58		130.0	
		Z	5.45	67.40	16.52		130.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.80	67.93	17.16	0.46	130.0	± 9.6 %
		Y	5.65	67.49	16.87		130.0	
		Z	5.62	67.80	19.01		130.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.58	67.37	16.87	0.46	130.0	± 9.6 %
		Y	5.44	66.92	16.57		130.0	
		Z	5.37	67.27	16.59		130.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.68	67.64	17.00	0.46	130.0	± 9.6 %
		Y	5.56	67.28	16.75		130.0	
		Z	5.43	67.44	16.68		130.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.46	67.16	16.84	0.46	130.0	± 9.6 %
		Y	5.33	66.89	16.32		130.0	
		Z	5.20	66.87	16.23		130.0	

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10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.76	66.21	16.35	0.46	130.0	± 9.6 %
		Y	4.60	65.68	15.94		130.0	
		Z	4.55	66.17	16.05		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.97	66.64	16.51	0.46	130.0	± 9.6 %
		Y	4.79	66.07	16.11		130.0	
		Z	4.73	66.56	16.21		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.86	66.52	16.38	0.46	130.0	± 9.6 %
		Y	4.68	65.92	15.94		130.0	
		Z	4.62	66.40	16.04		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.91	66.68	16.54	0.46	130.0	± 9.6 %
		Y	4.73	66.08	16.11		130.0	
		Z	4.67	66.58	16.22		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.83	66.50	16.39	0.46	130.0	± 9.6 %
		Y	4.65	65.89	15.96		130.0	
		Z	4.59	66.38	16.06		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.85	66.66	16.44	0.46	130.0	± 9.6 %
		Y	4.66	66.04	16.00		130.0	
		Z	4.59	66.49	16.08		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.86	66.57	16.33	0.46	130.0	± 9.6 %
		Y	4.67	65.94	15.89		130.0	
		Z	4.59	66.36	15.95		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.80	66.77	16.57	0.46	130.0	± 9.6 %
		Y	4.60	66.11	16.11		130.0	
		Z	4.55	66.63	16.24		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.83	66.31	16.17	0.46	130.0	± 9.6 %
		Y	4.65	65.72	15.74		130.0	
		Z	4.57	66.14	15.79		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.40	66.72	16.51	0.46	130.0	± 9.6 %
		Y	5.25	66.20	16.17		130.0	
		Z	5.18	66.58	16.21		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.46	66.82	16.52	0.46	130.0	± 9.6 %
		Y	5.32	66.35	16.21		130.0	
		Z	5.23	66.70	16.24		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.36	66.91	16.59	0.46	130.0	± 9.6 %
		Y	5.20	66.37	16.23		130.0	
		Z	5.13	66.77	16.30		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.38	66.73	16.44	0.46	130.0	± 9.6 %
		Y	5.23	66.21	16.09		130.0	
		Z	5.14	66.53	16.10		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.40	66.81	16.52	0.46	130.0	± 9.6 %
		Y	5.33	66.26	16.17		130.0	
		Z	5.23	66.56	16.17		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.47	66.89	16.68	0.46	130.0	± 9.6 %
		Y	5.31	66.35	16.33		130.0	
		Z	5.24	66.76	16.40		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.47	67.00	16.72	0.46	130.0	± 9.6 %
		Y	5.33	66.52	16.41		130.0	
		Z	5.26	66.89	16.45		130.0	

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10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.38	66.59	16.41	0.46	130.0	± 9.6 %
		Y	5.20	66.04	16.05		130.0	
		Z	5.12	66.39	16.07		130.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.54	66.74	16.54	0.46	130.0	± 9.6 %
		Y	5.40	66.26	16.22		130.0	
		Z	5.31	66.69	16.23		130.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.91	67.68	17.05	0.46	130.0	± 9.6 %
		Y	5.81	67.35	16.82		130.0	
		Z	5.60	67.33	16.65		130.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.66	66.70	16.44	0.46	130.0	± 9.6 %
		Y	5.54	66.25	16.12		130.0	
		Z	5.47	66.64	16.16		130.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.90	67.26	16.84	0.46	130.0	± 9.6 %
		Y	5.79	66.84	16.38		130.0	
		Z	5.67	67.08	16.34		130.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.73	66.91	16.42	0.46	130.0	± 9.6 %
		Y	5.58	66.38	16.08		130.0	
		Z	5.49	66.66	16.06		130.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.81	66.97	16.43	0.46	130.0	± 9.6 %
		Y	5.67	66.48	16.13		130.0	
		Z	5.56	66.69	16.07		130.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	6.26	68.50	17.19	0.46	130.0	± 9.6 %
		Y	6.18	68.17	16.96		130.0	
		Z	5.83	67.70	16.58		130.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.19	68.38	17.32	0.46	130.0	± 9.6 %
		Y	6.03	67.83	16.99		130.0	
		Z	5.86	67.92	16.80		130.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.89	67.37	16.83	0.46	130.0	± 9.6 %
		Y	5.75	66.88	16.63		130.0	
		Z	5.67	67.23	16.57		130.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.81	67.14	16.55	0.46	130.0	± 9.6 %
		Y	5.64	66.53	16.16		130.0	
		Z	5.57	66.89	16.21		130.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.79	67.15	16.62	0.46	130.0	± 9.6 %
		Y	5.63	66.56	16.28		130.0	
		Z	5.56	66.96	16.31		130.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.66	66.48	16.03	0.46	130.0	± 9.6 %
		Y	5.52	65.92	15.67		130.0	
		Z	5.41	66.16	15.69		130.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	6.07	67.13	16.52	0.46	130.0	± 9.6 %
		Y	5.95	66.65	16.23		130.0	
		Z	5.87	66.97	16.23		130.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.23	67.50	16.88	0.46	130.0	± 9.6 %
		Y	6.11	67.04	16.40		130.0	
		Z	6.00	67.28	16.36		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.23	67.47	16.85	0.46	130.0	± 9.6 %
		Y	6.11	67.00	16.38		130.0	
		Z	6.01	67.20	16.34		130.0	

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EX3DV4– SN:3938 October 24, 2018

10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.23	67.49	16.70	0.46	130.0	± 9.6 %
		Y	6.09	66.87	16.39		130.0	
		Z	6.00	67.25	16.37		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.25	67.50	16.67	0.46	130.0	± 9.6 %
		Y	6.11	67.01	16.35		130.0	
		Z	5.99	67.21	16.25		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.25	67.31	16.57	0.46	100.0	± 9.6 %
		Y	6.13	66.86	16.30		130.0	
		Z	6.03	67.11	16.26		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.33	67.65	16.91	0.46	130.0	± 9.6 %
		Y	6.16	67.13	16.60		130.0	
		Z	6.10	67.47	16.62		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.15	67.31	16.65	0.46	130.0	± 9.6 %
		Y	6.02	66.62	16.34		130.0	
		Z	5.91	67.06	16.30		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.35	67.93	16.98	0.46	130.0	± 9.6 %
		Y	6.21	67.40	16.65		130.0	
		Z	6.05	67.49	16.53		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.71	68.51	17.21	0.46	130.0	± 9.6 %
		Y	6.68	68.36	17.09		150.0	
		Z	6.25	67.70	16.59		130.0	
10646-AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	86.17	140.32	45.40	9.30	60.0	± 9.6 %
		Y	39.04	122.44	40.63		60.0	
		Z	18.19	104.43	33.83		60.0	
10647-AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	80.45	139.77	45.43	9.30	60.0	± 9.6 %
		Y	36.72	121.84	40.66		60.0	
		Z	16.41	102.98	33.52		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.87	66.51	13.20	0.00	150.0	± 9.6 %
		Y	0.58	61.72	9.15		150.0	
		Z	0.69	64.69	11.24		150.0	
10652-AAD	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	4.31	69.00	17.79	2.23	80.0	± 9.6 %
		Y	3.89	67.39	16.71		80.0	
		Z	3.64	67.10	16.29		80.0	
10653-AAD	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.72	67.91	17.64	2.23	80.0	± 9.6 %
		Y	4.40	66.72	16.87		80.0	
		Z	4.16	66.48	16.48		80.0	
10654-AAD	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.84	67.52	17.60	2.23	80.0	± 9.6 %
		Y	4.35	66.39	16.88		80.0	
		Z	4.14	66.16	16.50		80.0	
10655-AAE	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.69	67.54	17.64	2.23	80.0	± 9.6 %
		Y	4.42	66.40	16.92		80.0	
		Z	4.19	66.14	16.53		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	100.00	116.59	30.15	10.00	50.0	± 9.6 %
		Y	27.27	97.34	24.81		50.0	
		Z	5.41	73.00	14.99		80.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	100.00	114.08	27.78	6.99	60.0	± 9.6 %
		Y	100.00	111.98	26.70		60.0	
		Z	5.08	74.98	14.50		80.0	

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10660-AAA	Pulse Waveform (200Hz, 40%)	X	100.00	113.57	26.20	3.98	80.0	± 9.6 %
		Y	100.00	108.48	23.71		80.0	
		Z	17.56	86.88	16.64		80.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	100.00	116.76	26.28	2.22	100.0	± 9.6 %
		Y	100.00	105.43	21.11		100.0	
		Z	100.00	100.82	18.62		100.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	100.00	127.89	28.96	0.97	120.0	± 9.6 %
		Y	3.43	74.94	10.68		120.0	
		Z	100.00	98.67	16.42		120.0	
10670-AAA	Bluetooth Low Energy	X	100.00	117.22	26.83	2.19	100.0	± 9.6 %
		Y	100.00	107.88	22.47		100.0	
		Z	100.00	104.58	20.49		100.0	

[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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8. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test (0.3-3G)

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	3.15%	N	1	1	0.64	0.43	2.02%	1.35%	M
Liquid Conductivity (mea.)	3.47%	N	1	1	0.6	0.49	2.08%	1.70%	M
Combined standard uncertainty		RSS					11.78%	11.61%	
Expant uncertainty (95% confidence							23.56%	23.23%	

Measurement Uncertainty evaluation template for DUT SAR test (3-6G)

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.55%	N	1	1	1	1	6.55%	6.55%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	3.08%	N	1	1	0.64	0.43	1.97%	1.32%	M
Liquid Conductivity (mea.)	3.15%	N	1	1	0.6	0.49	1.89%	1.54%	M
Combined standard uncertainty		RSS					12.03%	11.88%	
Expant uncertainty (95% confidence							24.06%	23.76%	

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

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Doc No 881 – QD 000 P40 C – F Page 1 (1)

10. System Validation from Original Equipment Supplier

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

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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 0108**

Client: **Auden**

Certificate No: **D835V2-4d120_Jun18**

CALIBRATION CERTIFICATE

Object	D835V2 - SN:4d120
Calibration procedure(s)	QA CAL-05.v10 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	June 20, 2018

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 NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: June 21, 2018

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

Certificate No: D835V2-4d120_Jun18 Page 1 of 8

Calibration Laboratory of
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Engineering AG
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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 0108**

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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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	V52.10.1
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	40.7 ± 6 %	0.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.37 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.06 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.68 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.36 W/kg ± 16.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.5 Ω - 3.1 jΩ
Return Loss	- 29.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 5.8 jΩ
Return Loss	- 24.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.398 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	June 29, 2010

DASY5 Validation Report for Head TSL

Date: 20.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

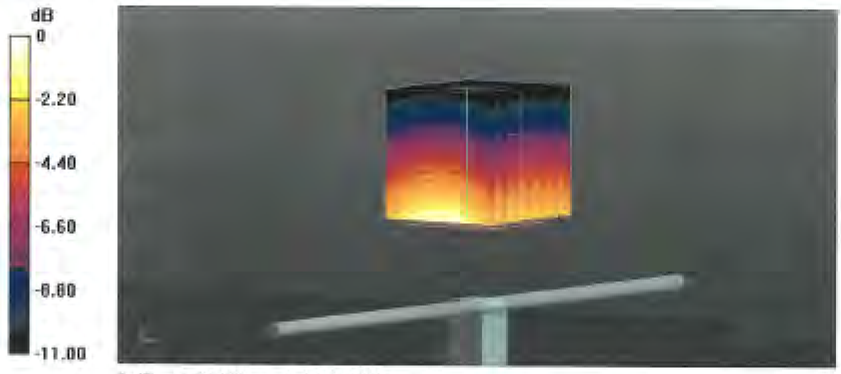
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d120

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.93 S/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

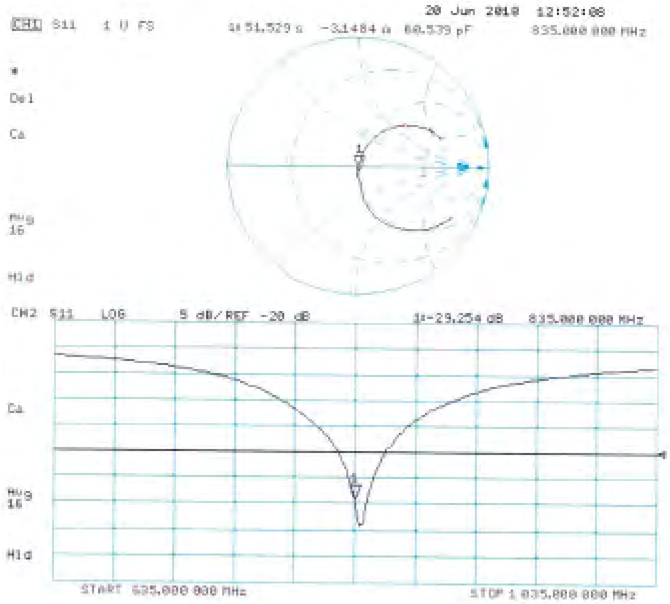
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.60 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.71 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.27 W/kg



0 dB = 3.27 W/kg = 5.15 dBW/kg

Certificate No: D835V2-4d120_Jun18   Page 5 of 8

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 20.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

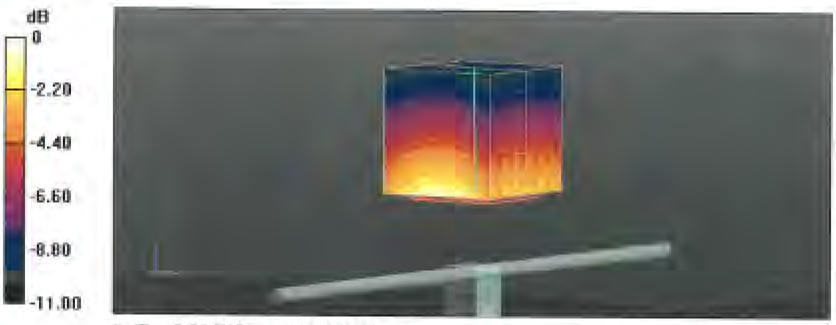
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d120

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 61.00 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (measured) = 3.28 W/kg



0 dB = 3.28 W/kg = 5.16 dBW/kg

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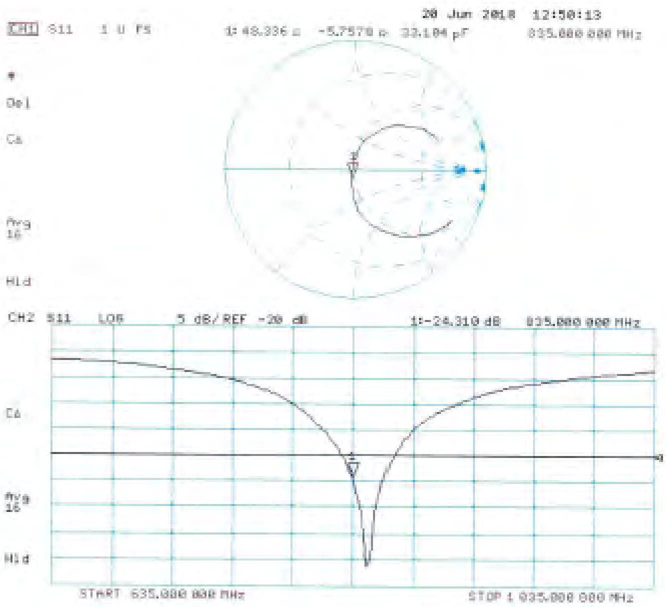
Impedance Measurement Plot for Body TSL



Certificate No: D835V2-4d120_Jun18 Page 8 of 8

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Accreditation No.: **SCS 0108**

Client **Auden**

Certificate No: **D1750V2-1023_Jun18**

CALIBRATION CERTIFICATE

Object	D1750V2 - SN:1023
Calibration procedure(s)	QA CAL-05.v10 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	June 11, 2018

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 NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: June 11, 2018

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Certificate No: D1750V2-1023_Jun18 Page 1 of 8

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Accreditation No.: **SCS 0108**

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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.82 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.3 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	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.6 ± 6 %	1.47 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.12 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.90 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.7 W/kg ± 16.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.0 Ω - 0.5 jΩ
Return Loss	- 39.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0 Ω + 0.3 jΩ
Return Loss	- 27.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.217 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	August 20, 2009

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DASY5 Validation Report for Head TSL

Date: 11.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

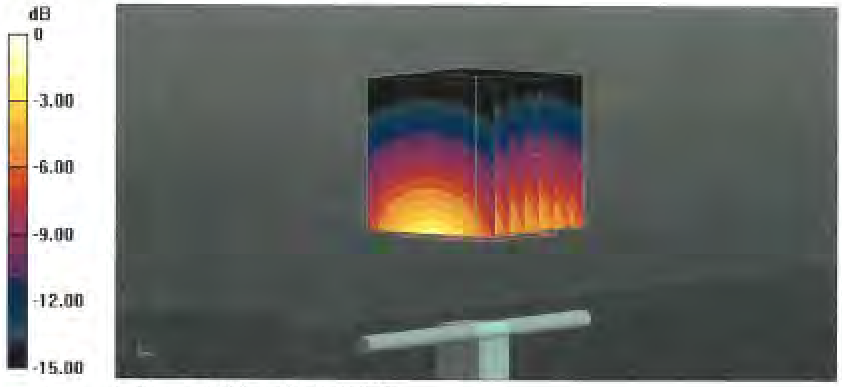
DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1023

Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

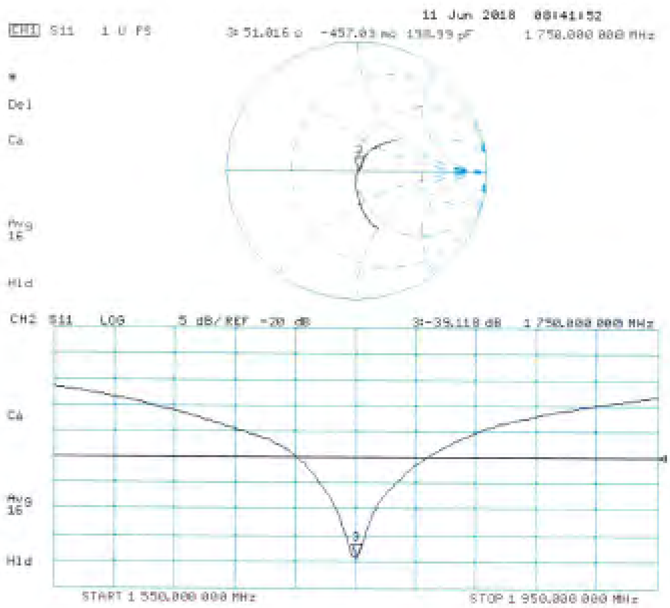
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.5 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 9.1 W/kg; SAR(10 g) = 4.82 W/kg
Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.46 dBW/kg

Certificate No: D1750V2-1023_Jun18 Page 5 of 8

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 11.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

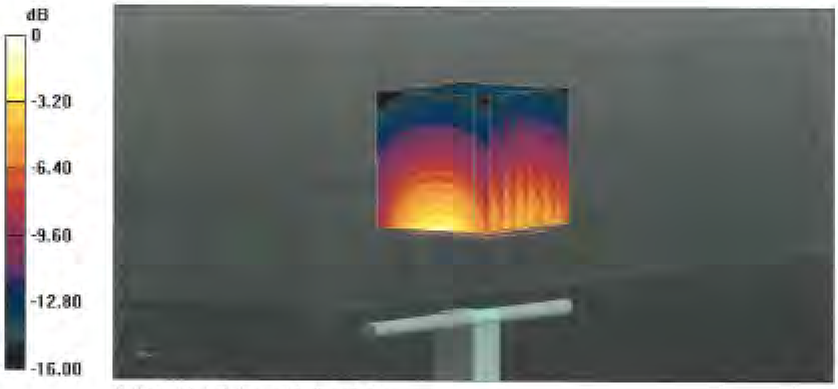
DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1023

Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.47 S/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

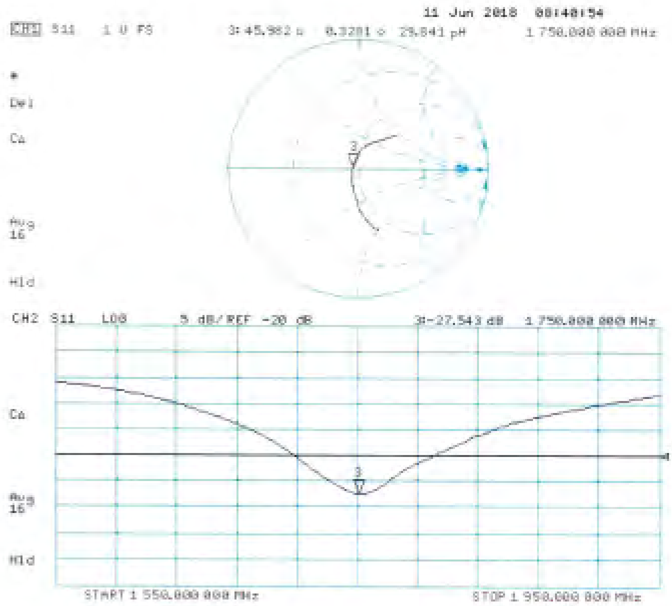
- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 102.3 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 9.12 W/kg; SAR(10 g) = 4.9 W/kg
Maximum value of SAR (measured) = 13.5 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

Impedance Measurement Plot for Body TSL



Certificate No: D1750V2-1023_Jun18 Page 8 of 8

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Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **D1900V2-5d173_Apr18**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN:5d173
Calibration procedure(s)	QA CAL-05.v10 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	April 25, 2018

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 NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: April 25, 2018

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Certificate No: D1900V2-5d173_Apr18 Page 1 of 8

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Accreditation No.: **SCS 0108**

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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY5	V52.10.0
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	41.1 ± 6 %	1.35 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.89 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.3 ± 6 %	1.47 mho/m ± 6 %
Body TSL temperature change during test	≤ 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.93 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**40.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.30 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.6 W/kg ± 16.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.4 Ω + 5.1 jΩ
Return Loss	- 25.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω + 7.2 jΩ
Return Loss	- 22.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.195 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	June 08, 2012

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DASY5 Validation Report for Head TSL

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

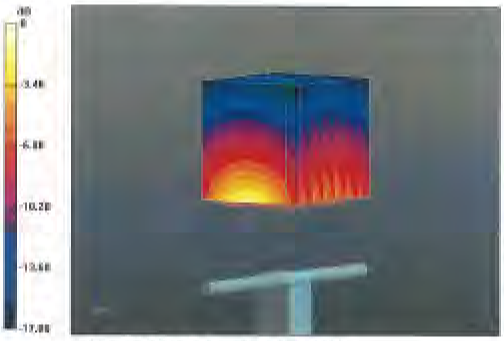
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.35 S/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 110.9 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 9.89 W/kg; SAR(10 g) = 5.21 W/kg
Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

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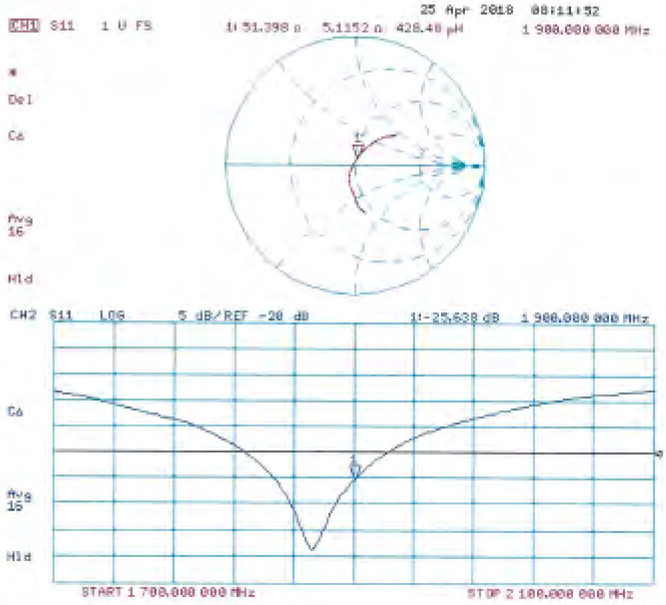
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

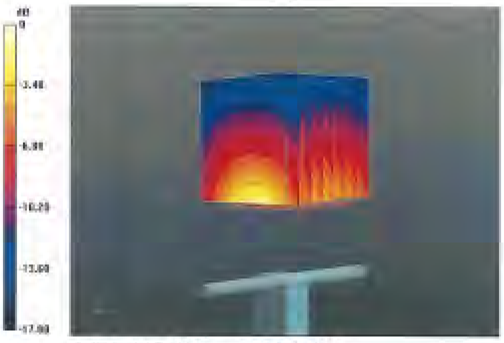
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.47 S/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.15, 8.15, 8.15); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 104.6 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 17.7 W/kg
SAR(1 g) = 9.93 W/kg; SAR(10 g) = 5.3 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



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

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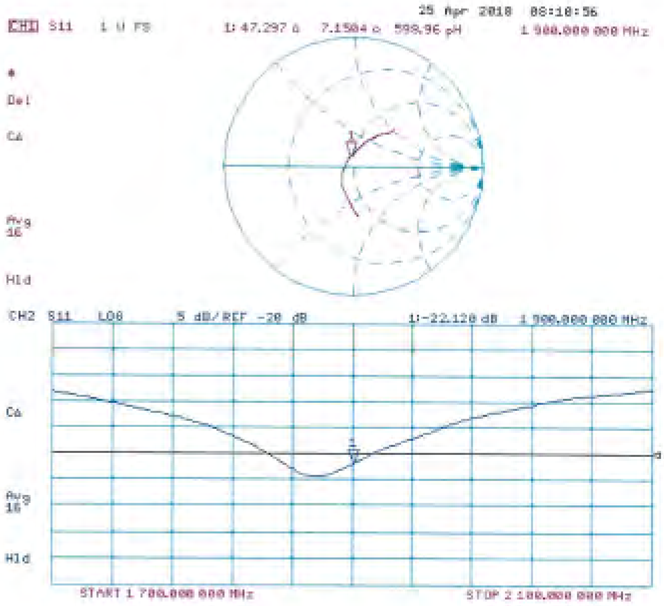
Impedance Measurement Plot for Body TSL



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **D2450V2-727_Apr18**

CALIBRATION CERTIFICATE

Object: D2450V2 - SN:727

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: April 24, 2018

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 NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: April 25, 2018

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

Certificate No: D2450V2-727_Apr18 Page 1 of 8

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Accreditation No.: SCS 0108

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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.3 ± 6 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.3 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	52.5 ± 6 %	2.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**50.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.00 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.8 W/kg ± 16.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.2 Ω + 2.7 jΩ
Return Loss	- 25.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.2 Ω + 5.8 jΩ
Return Loss	- 25.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.149 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 09, 2003

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DASY5 Validation Report for Head TSL

Date: 24.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

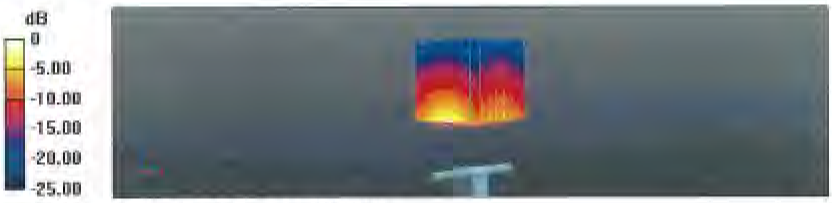
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 116.0 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 26.7 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.16 W/kg
Maximum value of SAR (measured) = 22.0 W/kg



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

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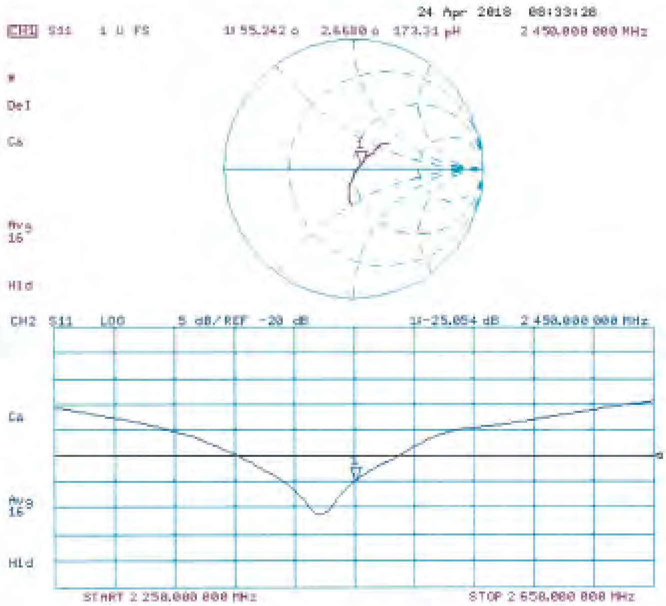
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 24.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

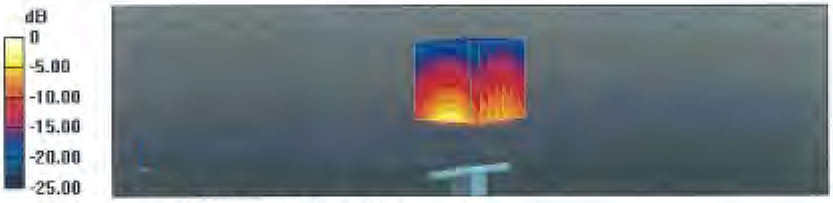
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.01 S/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.01, 8.01, 8.01); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 108.4 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 25.5 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6 W/kg
Maximum value of SAR (measured) = 21.1 W/kg



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

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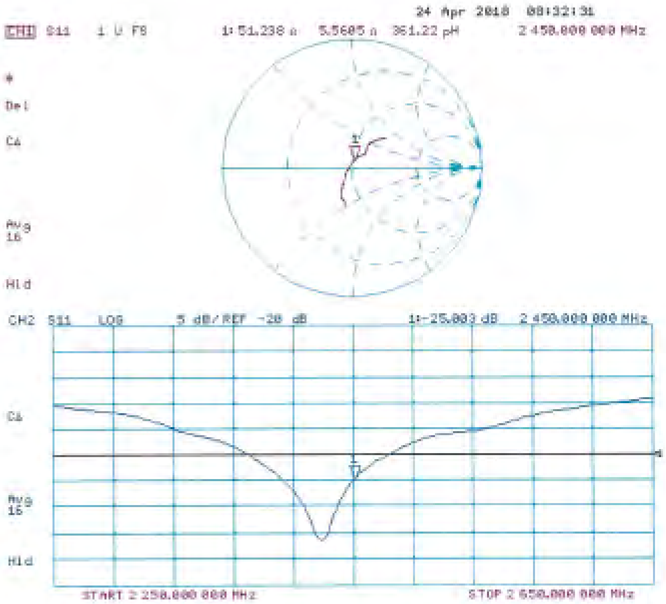
Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **D2600V2-1005_Jan18**

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 17, 2018

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 NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: January 17, 2018

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Certificate No: D2600V2-1005_Jan18 Page 1 of 8

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Accreditation No.: **SCS 0108**

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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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	V52.10.0
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	37.2 ± 6 %	2.04 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**56.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.49 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.5 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	51.1 ± 6 %	2.20 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**54.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.3 W/kg ± 16.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.4 Ω - 4.7 jΩ
Return Loss	- 26.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω - 3.0 jΩ
Return Loss	- 25.9 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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DASY5 Validation Report for Head TSL

Date: 17.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

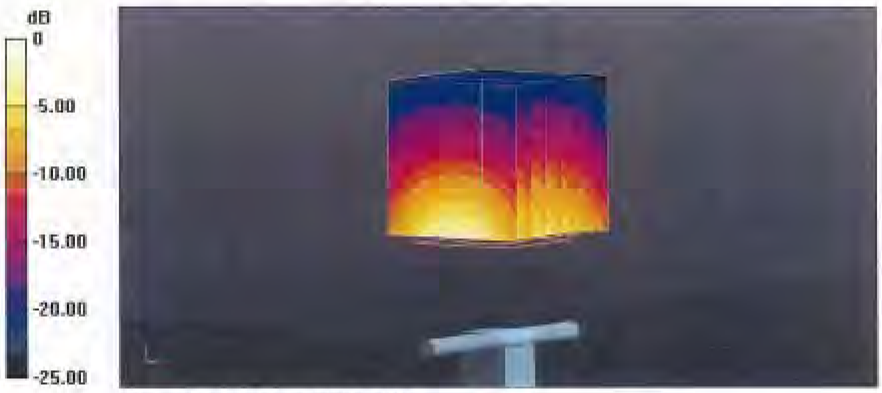
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1005

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.04 S/m; ε_r = 37.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.7, 7.7, 7.7); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 118.8 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.49 W/kg
Maximum value of SAR (measured) = 24.1 W/kg



0 dB = 24.1 W/kg = 13.82 dBW/kg

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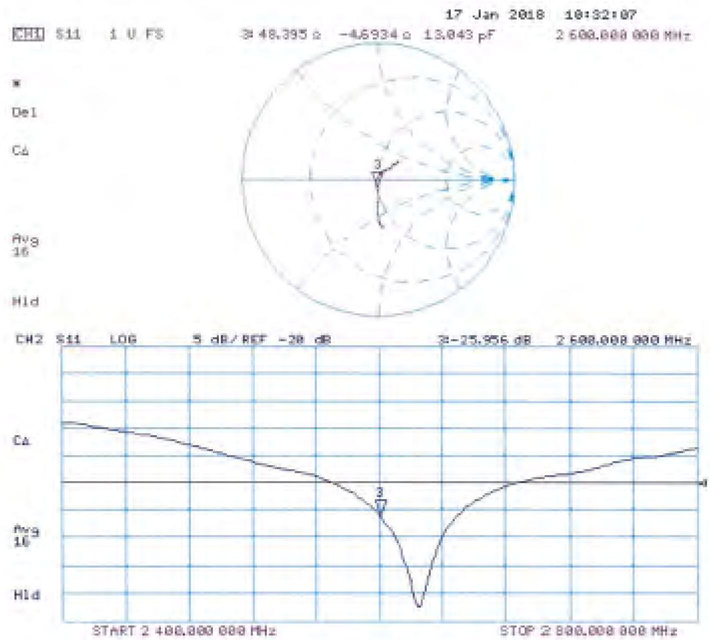
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 17.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

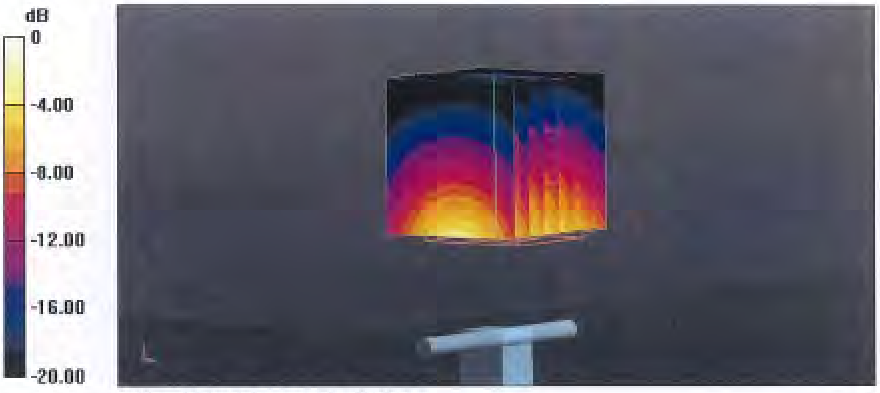
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1005

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.2 S/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.81, 7.81, 7.81); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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 = 108.0 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 28.6 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.13 W/kg
Maximum value of SAR (measured) = 22.6 W/kg



0 dB = 22.6 W/kg = 13.54 dBW/kg

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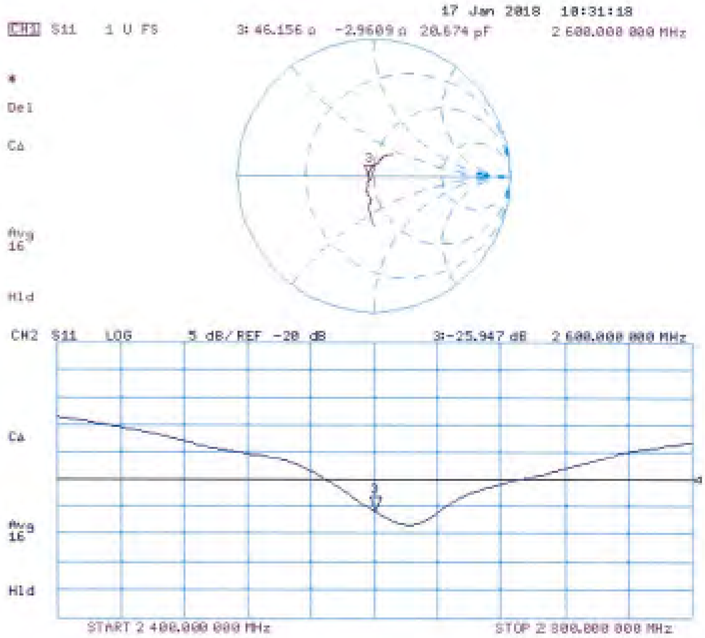
Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **D5GHzV2-1023_Jan18**

CALIBRATION CERTIFICATE

Object: D5GHzV2 - SN:1023

Calibration procedure(s): QA CAL-22.v2
Calibration procedure for dipole validation kits between 3-6 GHz

Calibration date: January 25, 2018

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 NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 3503	30-Dec-17 (No. EX3-3503_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: January 25, 2018

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Accreditation No.: **SCS 0108**

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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5300 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.3 ± 6 %	4.50 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.72 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**77.3 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.22 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.2 W/kg ± 19.5 % (k=2)**

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Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.2 ± 6 %	4.60 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.9 W / kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.32 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.2 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.8 ± 6 %	4.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**81.9 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.34 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.4 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.5 ± 6 %	5.11 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.90 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**79.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.25 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.5 W/kg ± 19.5 % (k=2)**

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Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.3 ± 6 %	5.41 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**70.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.00 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.8 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.1 ± 6 %	5.54 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.34 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**72.9 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.06 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.4 W/kg ± 19.5 % (k=2)**

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Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.6 ± 6 %	5.94 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.81 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**77.6 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.2 ± 6 %	6.22 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**74.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.07 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.5 W/kg ± 19.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	50.1 Ω - 8.1 jΩ
Return Loss	- 21.9 dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	50.5 Ω - 2.3 jΩ
Return Loss	- 32.7 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	53.9 Ω - 0.7 jΩ
Return Loss	- 28.4 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	55.3 Ω + 2.6 jΩ
Return Loss	- 25.1 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	49.8 Ω - 6.9 jΩ
Return Loss	- 23.2 dB

Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	50.9 Ω - 0.9 jΩ
Return Loss	- 37.9 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	56.0 Ω + 0.5 jΩ
Return Loss	- 24.9 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	56.6 Ω + 2.3 jΩ
Return Loss	- 23.7 dB

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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	February 05, 2004

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DASY5 Validation Report for Head TSL

Date: 25.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1023

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.5 S/m; ϵ_r = 36.3; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5300 MHz; σ = 4.6 S/m; ϵ_r = 36.2; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 4.9 S/m; ϵ_r = 35.8; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 5.11 S/m; ϵ_r = 35.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.75, 5.75, 5.75); Calibrated: 30.12.2017, ConvF(5.5, 5.5, 5.5); Calibrated: 30.12.2017, ConvF(5.05, 5.05, 5.05); Calibrated: 30.12.2017, ConvF(4.96, 4.96, 4.96); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.47 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 27.5 W/kg
SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 74.63 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 8.09 W/kg; SAR(10 g) = 2.32 W/kg
Maximum value of SAR (measured) = 18.6 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.79 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 8.19 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 19.6 W/kg

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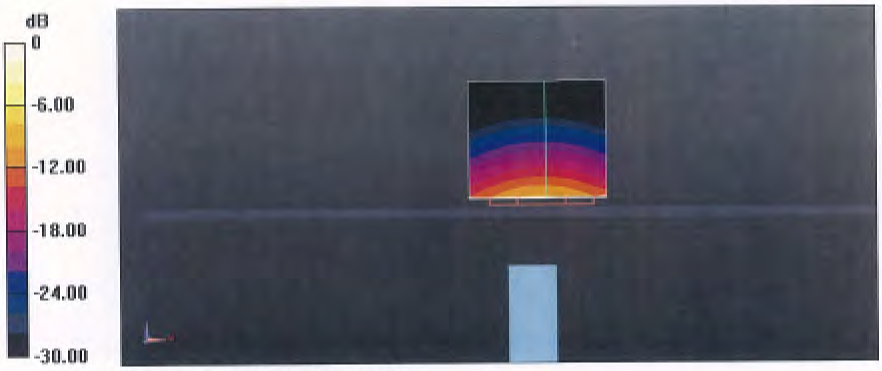
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.22 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 31.2 W/kg
SAR(1 g) = 7.9 W/kg; SAR(10 g) = 2.25 W/kg
Maximum value of SAR (measured) = 19.0 W/kg



0 dB = 17.7 W/kg = 12.48 dBW/kg

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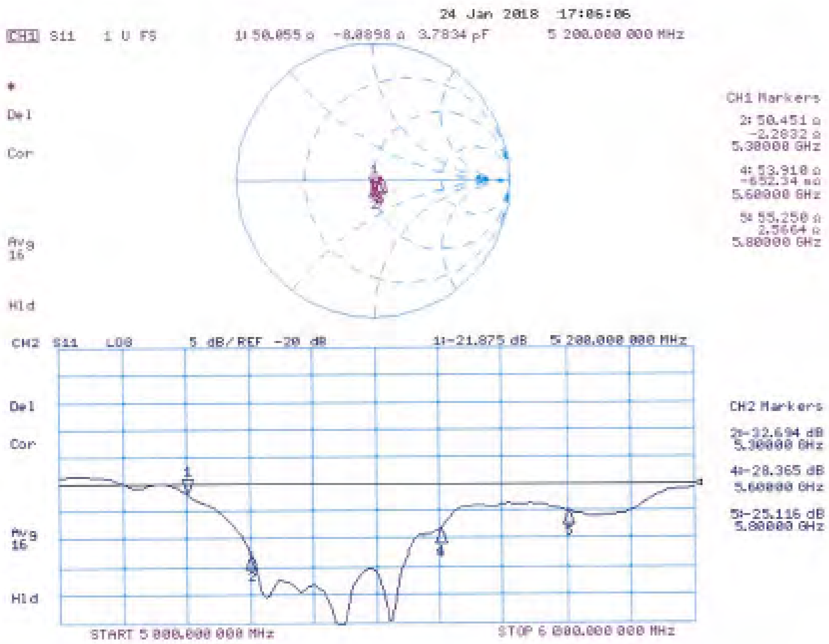
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 23.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1023

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 5.41 S/m; ε_r = 47.3; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5300 MHz; σ = 5.54 S/m; ε_r = 47.1; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 5.94 S/m; ε_r = 46.6; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 6.22 S/m; ε_r = 46.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

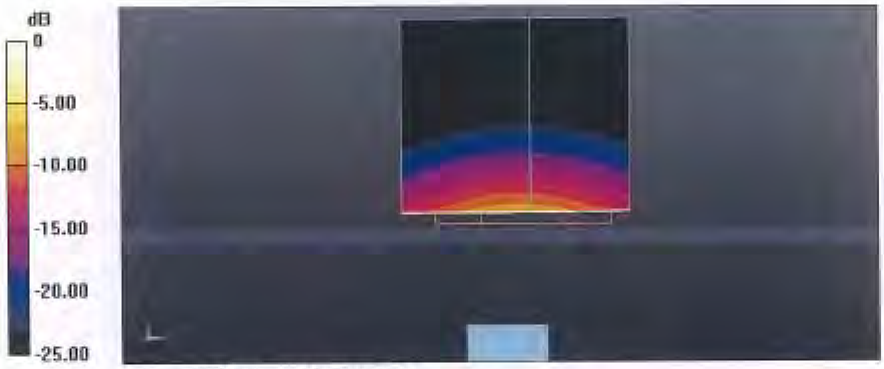
- Probe: EX3DV4 - SN3503; ConvF(5.35, 5.35, 5.35); Calibrated: 30.12.2017, ConvF(5.15, 5.15, 5.15); Calibrated: 30.12.2017, ConvF(4.65, 4.65, 4.65); Calibrated: 30.12.2017, ConvF(4.53, 4.53, 4.53); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.00 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 26.4 W/kg
SAR(1 g) = 7.14 W/kg; SAR(10 g) = 2 W/kg
Maximum value of SAR (measured) = 16.8 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.19 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 28.4 W/kg
SAR(1 g) = 7.34 W/kg; SAR(10 g) = 2.06 W/kg
Maximum value of SAR (measured) = 17.6 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.21 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 32.8 W/kg
SAR(1 g) = 7.81 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.05 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 7.46 W/kg; SAR(10 g) = 2.07 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 18.8 W/kg = 12.74 dBW/kg

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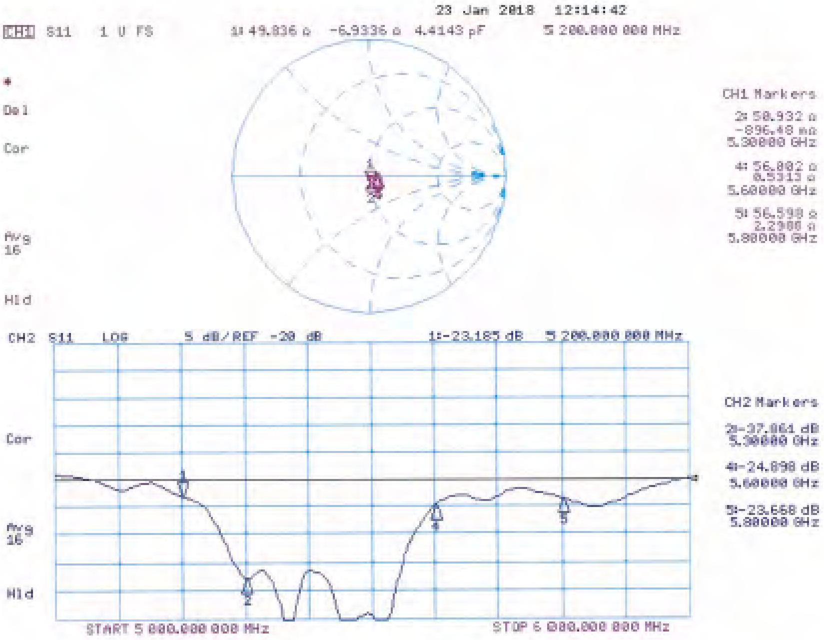
Impedance Measurement Plot for Body TSL



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- End of report -

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