SAR TEST REPORT

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

Equipment Under Test	Tablet Computer
Marketing Name	FZ-L1
Brand Name	Panasonic
Model No.	FZ-L1AA
Company Name	Panasonic Corporation of North America
Company Address	Two Riverfront Plaza, 9th Floor, Newark, NJ 07102-5490
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013, KDB616217D04v01r02,KDB865664D01v01r04, KDB865664D02v01r02,KDB941225D01v03r01, KDB941225D05v02r05,KDB447498D01v06, KDB248227D01v02r02
FCC ID	ACJFZL1B
Date of Receipt	Nov. 15, 2018
Date of Test(s)	Nov. 25, 2018 ~ Dec. 11, 2018
Date of Issue	Dec. 19, 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. 19, 2018

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Revision History

Report Number	Revision	Description	Issue Date
E5/2018/B0009	Rev.00	Initial creation of document	Dec. 13, 2018
E5/2018/B0009	Rev.01	Modify page 44	Dec. 19, 2018

Contents

1. General Information

1.1 Testing Laboratory

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1.2 Details of Applicant

Company Name	Panasonic Corporation of North America
Company Address	Two Riverfront Plaza, 9th Floor, Newark, NJ 07102-5490

1.3 Description of EUT

Equipment Under Test	Tablet Computer	
Marketing Name	FZ-L1	
Brand Name	Panasonic	
Model No.	FZ-L1AA	
FCC ID	ACJFZL1B	
Mode of Operation	☒WCDMA ☒HSDPA ☒HSUPA ☒HSPA+ ☒LTE FDD ☒WLAN802.11 a/b/g/n(20M/40M) ☒Bluetooth	
Duty Cycle	WCDMA	1
	LTE FDD	1
	WLAN802.11 a/b/g/n(20M/40M)	1
	Bluetooth	1
TX Frequency Range (MHz)	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 12	699 – 716
	LTE FDD Band 13	777 – 787
	WLAN802.11 b/g/n(20M)	2412 – 2462
	WLAN802.11 a/n(20M) 5.2G	5180 – 5240
	WLAN802.11 n(40M) 5.2G	5190 – 5230
	WLAN802.11 a/n(20M) 5.3G	5260 – 5320
	WLAN802.11 n(40M) 5.3G	5270 – 5310
	WLAN802.11 a/n (20M) 5.6G	5500 – 5720

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TX Frequency Range (MHz)	WLAN802.11 n (40M) 5.6G	5510	–	5710
	WLAN802.11 a/n(20M) 5.8G	5745	–	5825
	WLAN802.11 n(40M) 5.8G	5710	–	5795
	Bluetooth	2402	–	2480
Channel Number (ARFCN)	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 12	23017	–	23173
	LTE FDD Band 13	23205	–	23255
	WLAN802.11 b/g/n(20M)	1	–	11
	WLAN802.11 a/n(20M) 5.2G	36	–	48
	WLAN802.11 n(40M) 5.2G	38	–	46
	WLAN802.11 a/n(20M) 5.3G	52	–	64
	WLAN802.11 n(40M) 5.3G	54	–	62
	WLAN802.11 a/n (20M) 5.6G	100	–	144
	WLAN802.11 n (40M) 5.6G	102	–	142
	WLAN802.11 a/n(20M) 5.8G	149	–	165
	WLAN802.11 n(40M) 5.8G	142	–	159
	Bluetooth	0	–	78

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Max. SAR (1 g) (Unit: W/Kg)				
Band	Measured	Reported	Channel	Position
WCDMA Band II	0.98	1.15	9538	Back side
WCDMA Band V	0.96	1.26	4233	Back side
LTE FDD Band 2	0.99	1.11	18900	Back side
LTE FDD Band 4	1.01	1.19	20050	Back side
LTE FDD Band 5	1.13	1.13	20525	Back side
LTE FDD Band 12	1.26	1.27	23130	Back side
LTE FDD Band 13	1.18	1.20	23230	Back side

Max. SAR (1 g) (Unit: W/Kg)				
Band	Measured	Reported	Channel	Position
WLAN802.11 b	0.29	0.41	11	Bottom side
Bluetooth (GFSK)	0.04	0.06	0	Bottom side
WLAN802.11 n(40M) 5.2G	0.19	0.27	46	Left side
WLAN802.11 a 5.3G	0.64	0.96	60	Left side
WLAN802.11 a 5.6G	0.65	0.96	136	Left side
WLAN802.11 a 5.8G	0.75	1.12	165	Back side

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WCDMA Band II / Band V - HSDPA / HSUPA / HSPA+ conducted power table (Full power):

Unit: dBm

Band		WCDMA II		
TX Channel		9262	9400	9538
Frequency (MHz)		1852.4	1880	1907.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**23.20**		
3GPP Rel 99	RMC 12.2Kbps	22.34	22.24	22.28
3GPP Rel 5	HSDPA Subtest-1	21.92	22.01	22.23
	HSDPA Subtest-2	21.53	21.45	21.61
	HSDPA Subtest-3	21.53	21.47	21.65
	HSDPA Subtest-4	21.52	21.47	21.64
3GPP Rel 6	HSUPA Subtest-1	21.33	21.36	21.94
	HSUPA Subtest-2	20.44	20.48	20.76
	HSUPA Subtest-3	20.48	20.64	20.75
	HSUPA Subtest-4	20.79	20.93	21.15
	HSUPA Subtest-5	22.00	22.00	22.10
3GPP Rel 7	HSPA+ Subtest-1	21.33	21.25	21.29

Band		WCDMA V		
TX Channel		4132	4183	4233
Frequency (MHz)		826.4	836.6	846.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**23.00**		
3GPP Rel 99	RMC 12.2Kbps	21.87	21.79	21.80
3GPP Rel 5	HSDPA Subtest-1	20.80	20.78	20.73
	HSDPA Subtest-2	20.77	20.68	20.76
	HSDPA Subtest-3	20.36	20.29	20.26
	HSDPA Subtest-4	20.33	20.20	20.27
3GPP Rel 6	HSUPA Subtest-1	20.77	20.91	20.69
	HSUPA Subtest-2	20.34	20.23	20.25
	HSUPA Subtest-3	20.76	20.73	20.69
	HSUPA Subtest-4	20.81	20.74	20.72
	HSUPA Subtest-5	20.74	20.72	20.68
3GPP Rel 7	HSPA+ Subtest-1	20.88	20.77	20.81

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WCDMA Band II - HSDPA / HSUPA / HSPA+ conducted power table(Reduced power):

Unit: dBm

Band		WCDMA II		
TX Channel		9262	9400	9538
Frequency (MHz)		1852.4	1880	1907.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**18.50**		
3GPP Rel 99	RMC 12.2Kbps	17.67	17.68	17.79
3GPP Rel 5	HSDPA Subtest-1	17.46	17.15	17.57
	HSDPA Subtest-2	17.28	17.50	17.12
	HSDPA Subtest-3	17.66	17.46	17.62
	HSDPA Subtest-4	17.26	17.37	17.15
3GPP Rel 6	HSUPA Subtest-1	17.25	17.67	17.41
	HSUPA Subtest-2	17.52	17.13	17.06
	HSUPA Subtest-3	17.59	17.42	17.24
	HSUPA Subtest-4	17.35	17.22	17.56
	HSUPA Subtest-5	17.12	17.04	17.77
3GPP Rel 7	HSPA+ Subtest-1	17.55	17.58	17.61

Sub-Test for 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

Sub-Test for 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

LTE FDD Band 2 / Band 4 / Band 5 / Band 12 / Band 13 power table (Full power):

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	23.02	24	0
				1880	18900	23.06	24	0
				1900	19100	22.98	24	0
			50	1860	18700	23.05	24	0
				1880	18900	23.05	24	0
				1900	19100	23.31	24	0
			99	1860	18700	22.70	24	0
				1880	18900	22.94	24	0
				1900	19100	23.05	24	0
		50 RB	0	1860	18700	21.99	23	0-1
				1880	18900	22.08	23	0-1
				1900	19100	22.14	23	0-1
			25	1860	18700	21.86	23	0-1
				1880	18900	22.07	23	0-1
				1900	19100	22.12	23	0-1
			50	1860	18700	21.88	23	0-1
				1880	18900	22.11	23	0-1
				1900	19100	22.10	23	0-1
		100RB		1860	18700	22.05	23	0-1
				1880	18900	22.10	23	0-1
				1900	19100	22.18	23	0-1
	16-QAM	1 RB	0	1860	18700	22.11	23	0-1
				1880	18900	21.77	23	0-1
				1900	19100	22.15	23	0-1
			50	1860	18700	22.35	23	0-1
				1880	18900	21.77	23	0-1
				1900	19100	22.44	23	0-1
			99	1860	18700	22.26	23	0-1
				1880	18900	21.70	23	0-1
				1900	19100	22.01	23	0-1
		50 RB	0	1860	18700	20.89	22	0-2
				1880	18900	21.06	22	0-2
				1900	19100	21.13	22	0-2
			25	1860	18700	20.87	22	0-2
				1880	18900	21.03	22	0-2
				1900	19100	21.11	22	0-2
			50	1860	18700	20.79	22	0-2
				1880	18900	21.09	22	0-2
				1900	19100	21.06	22	0-2
		100RB		1860	18700	20.98	22	0-2
				1880	18900	20.99	22	0-2
				1900	19100	21.21	22	0-2

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	22.76	24	0
				1880	18900	22.82	24	0
				1902.5	19125	22.93	24	0
			36	1857.5	18675	22.68	24	0
				1880	18900	22.67	24	0
				1902.5	19125	22.69	24	0
			74	1857.5	18675	22.61	24	0
				1880	18900	22.71	24	0
				1902.5	19125	22.94	24	0
		36 RB	0	1857.5	18675	21.81	23	0-1
				1880	18900	21.80	23	0-1
				1902.5	19125	21.93	23	0-1
			18	1857.5	18675	21.76	23	0-1
				1880	18900	21.83	23	0-1
				1902.5	19125	21.90	23	0-1
			37	1857.5	18675	21.68	23	0-1
				1880	18900	21.90	23	0-1
				1902.5	19125	21.91	23	0-1
		75RB		1857.5	18675	21.79	23	0-1
				1880	18900	21.85	23	0-1
				1902.5	19125	22.01	23	0-1
	16-QAM	1 RB	0	1857.5	18675	21.88	23	0-1
				1880	18900	21.81	23	0-1
				1902.5	19125	22.19	23	0-1
			36	1857.5	18675	21.36	23	0-1
				1880	18900	21.78	23	0-1
				1902.5	19125	21.92	23	0-1
			74	1857.5	18675	21.59	23	0-1
				1880	18900	22.02	23	0-1
				1902.5	19125	22.18	23	0-1
		36 RB	0	1857.5	18675	20.78	22	0-2
				1880	18900	20.82	22	0-2
				1902.5	19125	20.84	22	0-2
			18	1857.5	18675	20.73	22	0-2
				1880	18900	20.76	22	0-2
				1902.5	19125	20.69	22	0-2
			37	1857.5	18675	20.63	22	0-2
				1880	18900	20.81	22	0-2
				1902.5	19125	20.74	22	0-2
		75RB		1857.5	18675	20.73	22	0-2
				1880	18900	20.75	22	0-2
				1902.5	19125	20.80	22	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	22.64	24	0
				1880	18900	22.85	24	0
				1905	19150	22.85	24	0
			25	1855	18650	22.61	24	0
				1880	18900	23.08	24	0
				1905	19150	23.28	24	0
			49	1855	18650	22.62	24	0
				1880	18900	22.91	24	0
				1905	19150	23.16	24	0
		25 RB	0	1855	18650	21.86	23	0-1
				1880	18900	21.90	23	0-1
				1905	19150	22.05	23	0-1
			12	1855	18650	21.84	23	0-1
				1880	18900	21.89	23	0-1
				1905	19150	22.08	23	0-1
			25	1855	18650	21.82	23	0-1
				1880	18900	21.86	23	0-1
				1905	19150	21.90	23	0-1
		50RB		1855	18650	21.81	23	0-1
				1880	18900	21.86	23	0-1
				1905	19150	22.09	23	0-1
	16-QAM	1 RB	0	1855	18650	21.87	23	0-1
				1880	18900	21.68	23	0-1
				1905	19150	21.82	23	0-1
			25	1855	18650	22.28	23	0-1
				1880	18900	21.94	23	0-1
				1905	19150	21.91	23	0-1
			49	1855	18650	21.85	23	0-1
				1880	18900	21.68	23	0-1
				1905	19150	21.82	23	0-1
		25 RB	0	1855	18650	21.09	22	0-2
				1880	18900	20.89	22	0-2
				1905	19150	21.14	22	0-2
			12	1855	18650	20.90	22	0-2
				1880	18900	20.80	22	0-2
				1905	19150	21.18	22	0-2
			25	1855	18650	20.75	22	0-2
				1880	18900	20.99	22	0-2
				1905	19150	20.95	22	0-2
		50RB		1855	18650	20.73	22	0-2
				1880	18900	20.76	22	0-2
				1905	19150	20.97	22	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	22.76	24	0
				1880	18900	22.79	24	0
				1907.5	19175	23.03	24	0
			12	1852.5	18625	22.93	24	0
				1880	18900	23.04	24	0
				1907.5	19175	23.17	24	0
			24	1852.5	18625	22.84	24	0
				1880	18900	22.85	24	0
				1907.5	19175	23.07	24	0
		12 RB	0	1852.5	18625	21.81	23	0-1
				1880	18900	21.81	23	0-1
				1907.5	19175	21.77	23	0-1
			6	1852.5	18625	21.79	23	0-1
				1880	18900	21.84	23	0-1
				1907.5	19175	21.95	23	0-1
			13	1852.5	18625	21.83	23	0-1
				1880	18900	21.82	23	0-1
				1907.5	19175	21.96	23	0-1
		25RB		1852.5	18625	21.82	23	0-1
				1880	18900	21.81	23	0-1
				1907.5	19175	21.89	23	0-1
	16-QAM	1 RB	0	1852.5	18625	21.74	23	0-1
				1880	18900	21.59	23	0-1
				1907.5	19175	22.25	23	0-1
			12	1852.5	18625	21.70	23	0-1
				1880	18900	21.71	23	0-1
				1907.5	19175	22.26	23	0-1
			24	1852.5	18625	21.69	23	0-1
				1880	18900	21.62	23	0-1
				1907.5	19175	21.73	23	0-1
		12 RB	0	1852.5	18625	20.76	22	0-2
				1880	18900	20.63	22	0-2
				1907.5	19175	20.69	22	0-2
			6	1852.5	18625	20.71	22	0-2
				1880	18900	20.78	22	0-2
				1907.5	19175	20.76	22	0-2
			13	1852.5	18625	20.76	22	0-2
				1880	18900	20.76	22	0-2
				1907.5	19175	20.87	22	0-2
		25RB		1852.5	18625	20.79	22	0-2
				1880	18900	20.88	22	0-2
				1907.5	19175	20.98	22	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	22.59	24	0
				1880	18900	22.70	24	0
				1908.5	19185	22.78	24	0
			7	1851.5	18615	22.50	24	0
				1880	18900	22.93	24	0
				1908.5	19185	23.01	24	0
			14	1851.5	18615	22.48	24	0
				1880	18900	22.77	24	0
				1908.5	19185	23.14	24	0
		8 RB	0	1851.5	18615	21.74	23	0-1
				1880	18900	21.82	23	0-1
				1908.5	19185	21.88	23	0-1
			4	1851.5	18615	21.74	23	0-1
				1880	18900	21.78	23	0-1
				1908.5	19185	21.96	23	0-1
			7	1851.5	18615	21.82	23	0-1
				1880	18900	21.81	23	0-1
				1908.5	19185	21.98	23	0-1
		15RB		1851.5	18615	21.71	23	0-1
				1880	18900	21.75	23	0-1
				1908.5	19185	21.93	23	0-1
	16-QAM	1 RB	0	1851.5	18615	21.80	23	0-1
				1880	18900	21.59	23	0-1
				1908.5	19185	21.73	23	0-1
			7	1851.5	18615	21.85	23	0-1
				1880	18900	21.69	23	0-1
				1908.5	19185	21.75	23	0-1
			14	1851.5	18615	21.86	23	0-1
				1880	18900	21.55	23	0-1
				1908.5	19185	21.80	23	0-1
		8 RB	0	1851.5	18615	20.58	22	0-2
				1880	18900	20.87	22	0-2
				1908.5	19185	20.62	22	0-2
			4	1851.5	18615	20.56	22	0-2
				1880	18900	20.82	22	0-2
				1908.5	19185	20.90	22	0-2
			7	1851.5	18615	20.58	22	0-2
				1880	18900	20.78	22	0-2
				1908.5	19185	20.96	22	0-2
		15RB		1851.5	18615	20.50	22	0-2
				1880	18900	20.65	22	0-2
				1908.5	19185	21.02	22	0-2

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	22.61	24	0
				1880	18900	22.76	24	0
				1909.3	19193	22.74	24	0
			2	1850.7	18607	22.74	24	0
				1880	18900	22.82	24	0
				1909.3	19193	22.89	24	0
			5	1850.7	18607	22.58	24	0
				1880	18900	22.79	24	0
				1909.3	19193	22.73	24	0
		3 RB	0	1850.7	18607	22.65	24	0
				1880	18900	22.84	24	0
				1909.3	19193	22.91	24	0
			2	1850.7	18607	22.68	24	0
				1880	18900	22.78	24	0
				1909.3	19193	22.95	24	0
			3	1850.7	18607	22.78	24	0
				1880	18900	22.74	24	0
				1909.3	19193	22.90	24	0
		6RB		1850.7	18607	21.72	23	0-1
				1880	18900	21.75	23	0-1
				1909.3	19193	21.91	23	0-1
	16-QAM	1 RB	0	1850.7	18607	21.88	23	0-1
				1880	18900	21.58	23	0-1
				1909.3	19193	21.94	23	0-1
			2	1850.7	18607	21.86	23	0-1
				1880	18900	21.71	23	0-1
				1909.3	19193	22.10	23	0-1
			5	1850.7	18607	21.59	23	0-1
				1880	18900	21.28	23	0-1
				1909.3	19193	22.14	23	0-1
		3 RB	0	1850.7	18607	21.74	23	0-1
				1880	18900	21.57	23	0-1
				1909.3	19193	21.96	23	0-1
			2	1850.7	18607	21.86	23	0-1
				1880	18900	21.66	23	0-1
				1909.3	19193	22.11	23	0-1
			3	1850.7	18607	21.82	23	0-1
				1880	18900	21.61	23	0-1
				1909.3	19193	22.18	23	0-1
		6RB		1850.7	18607	20.76	22	0-2
				1880	18900	20.36	22	0-2
				1909.3	19193	20.58	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)
20	QPSK	1 RB	0	1720	20050	23.41	24.5	0
				1732.5	20175	23.25	24.5	0
				1745	20300	23.37	24.5	0
			50	1720	20050	23.17	24.5	0
				1732.5	20175	23.55	24.5	0
				1745	20300	23.05	24.5	0
			99	1720	20050	23.04	24.5	0
				1732.5	20175	22.84	24.5	0
				1745	20300	23.21	24.5	0
		50 RB	0	1720	20050	22.23	23.5	0-1
				1732.5	20175	22.14	23.5	0-1
				1745	20300	22.25	23.5	0-1
			25	1720	20050	22.06	23.5	0-1
				1732.5	20175	22.14	23.5	0-1
				1745	20300	22.00	23.5	0-1
			50	1720	20050	21.96	23.5	0-1
				1732.5	20175	22.05	23.5	0-1
				1745	20300	22.05	23.5	0-1
		100RB		1720	20050	22.05	23.5	0-1
				1732.5	20175	22.14	23.5	0-1
				1745	20300	22.05	23.5	0-1
	16-QAM	1 RB	0	1720	20050	22.89	23.5	0-1
				1732.5	20175	22.28	23.5	0-1
				1745	20300	22.83	23.5	0-1
			50	1720	20050	22.25	23.5	0-1
				1732.5	20175	22.43	23.5	0-1
				1745	20300	22.69	23.5	0-1
			99	1720	20050	21.76	23.5	0-1
				1732.5	20175	22.18	23.5	0-1
				1745	20300	22.52	23.5	0-1
		50 RB	0	1720	20050	21.16	22.5	0-2
				1732.5	20175	21.31	22.5	0-2
				1745	20300	21.17	22.5	0-2
			25	1720	20050	21.02	22.5	0-2
				1732.5	20175	21.18	22.5	0-2
				1745	20300	21.05	22.5	0-2
			50	1720	20050	20.88	22.5	0-2
				1732.5	20175	21.20	22.5	0-2
				1745	20300	21.01	22.5	0-2
		100RB		1720	20050	21.02	22.5	0-2
				1732.5	20175	21.18	22.5	0-2
				1745	20300	20.98	22.5	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)
15	QPSK	1 RB	0	1717.5	20025	23.25	24.5	0
				1732.5	20175	23.27	24.5	0
				1747.5	20325	23.22	24.5	0
			36	1717.5	20025	22.95	24.5	0
				1732.5	20175	23.21	24.5	0
				1747.5	20325	22.94	24.5	0
			74	1717.5	20025	22.79	24.5	0
				1732.5	20175	22.90	24.5	0
				1747.5	20325	23.16	24.5	0
		36 RB	0	1717.5	20025	22.10	23.5	0-1
				1732.5	20175	22.08	23.5	0-1
				1747.5	20325	22.04	23.5	0-1
			18	1717.5	20025	21.95	23.5	0-1
				1732.5	20175	22.06	23.5	0-1
				1747.5	20325	21.91	23.5	0-1
			37	1717.5	20025	21.92	23.5	0-1
				1732.5	20175	21.98	23.5	0-1
				1747.5	20325	22.00	23.5	0-1
		75RB		1717.5	20025	22.02	23.5	0-1
				1732.5	20175	22.03	23.5	0-1
				1747.5	20325	21.90	23.5	0-1
	16-QAM	1 RB	0	1717.5	20025	22.28	23.5	0-1
				1732.5	20175	22.58	23.5	0-1
				1747.5	20325	22.64	23.5	0-1
			36	1717.5	20025	21.87	23.5	0-1
				1732.5	20175	22.64	23.5	0-1
				1747.5	20325	22.39	23.5	0-1
			74	1717.5	20025	21.73	23.5	0-1
				1732.5	20175	22.36	23.5	0-1
				1747.5	20325	22.61	23.5	0-1
		36 RB	0	1717.5	20025	20.95	22.5	0-2
				1732.5	20175	21.02	22.5	0-2
				1747.5	20325	20.99	22.5	0-2
			18	1717.5	20025	20.90	22.5	0-2
				1732.5	20175	20.99	22.5	0-2
				1747.5	20325	20.95	22.5	0-2
			37	1717.5	20025	20.91	22.5	0-2
				1732.5	20175	20.90	22.5	0-2
				1747.5	20325	20.96	22.5	0-2
		75RB		1717.5	20025	20.80	22.5	0-2
				1732.5	20175	20.97	22.5	0-2
				1747.5	20325	20.83	22.5	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	23.19	24.5	0
				1732.5	20175	23.07	24.5	0
				1750	20350	23.21	24.5	0
			25	1715	20000	23.07	24.5	0
				1732.5	20175	23.26	24.5	0
				1750	20350	23.43	24.5	0
			49	1715	20000	22.85	24.5	0
				1732.5	20175	22.99	24.5	0
				1750	20350	23.26	24.5	0
		25 RB	0	1715	20000	22.06	23.5	0-1
				1732.5	20175	21.98	23.5	0-1
				1750	20350	21.95	23.5	0-1
			12	1715	20000	22.01	23.5	0-1
				1732.5	20175	22.02	23.5	0-1
				1750	20350	22.02	23.5	0-1
			25	1715	20000	21.92	23.5	0-1
				1732.5	20175	21.97	23.5	0-1
				1750	20350	22.05	23.5	0-1
		50RB		1715	20000	22.06	23.5	0-1
				1732.5	20175	22.06	23.5	0-1
				1750	20350	22.06	23.5	0-1
	16-QAM	1 RB	0	1715	20000	22.42	23.5	0-1
				1732.5	20175	22.29	23.5	0-1
				1750	20350	22.31	23.5	0-1
			25	1715	20000	22.39	23.5	0-1
				1732.5	20175	22.48	23.5	0-1
				1750	20350	22.40	23.5	0-1
			49	1715	20000	22.18	23.5	0-1
				1732.5	20175	22.05	23.5	0-1
				1750	20350	22.29	23.5	0-1
		25 RB	0	1715	20000	20.97	22.5	0-2
				1732.5	20175	21.13	22.5	0-2
				1750	20350	21.08	22.5	0-2
			12	1715	20000	20.94	22.5	0-2
				1732.5	20175	20.80	22.5	0-2
				1750	20350	21.31	22.5	0-2
			25	1715	20000	20.84	22.5	0-2
				1732.5	20175	20.86	22.5	0-2
				1750	20350	21.32	22.5	0-2
		50RB		1715	20000	21.02	22.5	0-2
				1732.5	20175	20.99	22.5	0-2
				1750	20350	21.11	22.5	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	23.19	24.5	0
				1732.5	20175	23.23	24.5	0
				1752.5	20375	23.23	24.5	0
			12	1712.5	19975	23.17	24.5	0
				1732.5	20175	23.40	24.5	0
				1752.5	20375	23.50	24.5	0
			24	1712.5	19975	23.09	24.5	0
				1732.5	20175	23.17	24.5	0
				1752.5	20375	23.29	24.5	0
		12 RB	0	1712.5	19975	22.02	23.5	0-1
				1732.5	20175	22.00	23.5	0-1
				1752.5	20375	22.05	23.5	0-1
			6	1712.5	19975	21.87	23.5	0-1
				1732.5	20175	21.98	23.5	0-1
				1752.5	20375	22.03	23.5	0-1
			13	1712.5	19975	21.90	23.5	0-1
				1732.5	20175	21.97	23.5	0-1
				1752.5	20375	22.03	23.5	0-1
		25RB		1712.5	19975	21.92	23.5	0-1
				1732.5	20175	22.05	23.5	0-1
				1752.5	20375	22.09	23.5	0-1
	16-QAM	1 RB	0	1712.5	19975	22.28	23.5	0-1
				1732.5	20175	22.49	23.5	0-1
				1752.5	20375	22.21	23.5	0-1
			12	1712.5	19975	21.95	23.5	0-1
				1732.5	20175	22.24	23.5	0-1
				1752.5	20375	22.34	23.5	0-1
			24	1712.5	19975	22.27	23.5	0-1
				1732.5	20175	22.59	23.5	0-1
				1752.5	20375	22.00	23.5	0-1
		12 RB	0	1712.5	19975	20.98	22.5	0-2
				1732.5	20175	20.95	22.5	0-2
				1752.5	20375	21.01	22.5	0-2
			6	1712.5	19975	20.92	22.5	0-2
				1732.5	20175	20.93	22.5	0-2
				1752.5	20375	21.08	22.5	0-2
			13	1712.5	19975	20.86	22.5	0-2
				1732.5	20175	20.82	22.5	0-2
				1752.5	20375	21.09	22.5	0-2
		25RB		1712.5	19975	20.83	22.5	0-2
				1732.5	20175	21.04	22.5	0-2
				1752.5	20375	21.10	22.5	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)
3	QPSK	1 RB	0	1711.5	19965	23.18	24.5	0
				1732.5	20175	23.02	24.5	0
				1753.5	20385	23.08	24.5	0
			7	1711.5	19965	23.22	24.5	0
				1732.5	20175	23.25	24.5	0
				1753.5	20385	23.39	24.5	0
			14	1711.5	19965	22.97	24.5	0
				1732.5	20175	23.15	24.5	0
				1753.5	20385	23.23	24.5	0
		8 RB	0	1711.5	19965	22.04	23.5	0-1
				1732.5	20175	22.04	23.5	0-1
				1753.5	20385	22.10	23.5	0-1
			4	1711.5	19965	21.93	23.5	0-1
				1732.5	20175	21.93	23.5	0-1
				1753.5	20385	22.06	23.5	0-1
			7	1711.5	19965	21.87	23.5	0-1
				1732.5	20175	21.94	23.5	0-1
				1753.5	20385	22.03	23.5	0-1
		15RB		1711.5	19965	21.93	23.5	0-1
				1732.5	20175	21.95	23.5	0-1
				1753.5	20385	22.08	23.5	0-1
	16-QAM	1 RB	0	1711.5	19965	22.11	23.5	0-1
				1732.5	20175	22.43	23.5	0-1
				1753.5	20385	22.27	23.5	0-1
			7	1711.5	19965	21.90	23.5	0-1
				1732.5	20175	22.08	23.5	0-1
				1753.5	20385	22.34	23.5	0-1
			14	1711.5	19965	21.93	23.5	0-1
				1732.5	20175	22.25	23.5	0-1
				1753.5	20385	22.29	23.5	0-1
		8 RB	0	1711.5	19965	21.16	22.5	0-2
				1732.5	20175	21.05	22.5	0-2
				1753.5	20385	21.26	22.5	0-2
			4	1711.5	19965	20.86	22.5	0-2
				1732.5	20175	21.08	22.5	0-2
				1753.5	20385	21.20	22.5	0-2
			7	1711.5	19965	20.92	22.5	0-2
				1732.5	20175	21.08	22.5	0-2
				1753.5	20385	21.17	22.5	0-2
		15RB		1711.5	19965	20.87	22.5	0-2
				1732.5	20175	21.10	22.5	0-2
				1753.5	20385	21.13	22.5	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	23.02	24.5	0
				1732.5	20175	23.00	24.5	0
				1754.3	20393	23.03	24.5	0
			2	1710.7	19957	23.14	24.5	0
				1732.5	20175	23.00	24.5	0
				1754.3	20393	23.21	24.5	0
			5	1710.7	19957	23.00	24.5	0
				1732.5	20175	22.99	24.5	0
				1754.3	20393	23.06	24.5	0
		3 RB	0	1710.7	19957	23.08	24.5	0
				1732.5	20175	23.07	24.5	0
				1754.3	20393	23.12	24.5	0
			2	1710.7	19957	23.07	24.5	0
				1732.5	20175	23.08	24.5	0
				1754.3	20393	23.12	24.5	0
			3	1710.7	19957	23.05	24.5	0
				1732.5	20175	23.05	24.5	0
				1754.3	20393	23.12	24.5	0
		6RB		1710.7	19957	22.03	23.5	0-1
				1732.5	20175	22.05	23.5	0-1
				1754.3	20393	22.16	23.5	0-1
	16-QAM	1 RB	0	1710.7	19957	22.32	23.5	0-1
				1732.5	20175	22.16	23.5	0-1
				1754.3	20393	22.32	23.5	0-1
			2	1710.7	19957	21.94	23.5	0-1
				1732.5	20175	22.30	23.5	0-1
				1754.3	20393	21.98	23.5	0-1
			5	1710.7	19957	22.25	23.5	0-1
				1732.5	20175	22.61	23.5	0-1
				1754.3	20393	22.61	23.5	0-1
		3 RB	0	1710.7	19957	22.05	23.5	0-1
				1732.5	20175	22.07	23.5	0-1
				1754.3	20393	22.23	23.5	0-1
			2	1710.7	19957	22.04	23.5	0-1
				1732.5	20175	22.17	23.5	0-1
				1754.3	20393	22.13	23.5	0-1
			3	1710.7	19957	22.03	23.5	0-1
				1732.5	20175	22.22	23.5	0-1
				1754.3	20393	22.17	23.5	0-1
		6RB		1710.7	19957	21.07	22.5	0-2
				1732.5	20175	20.92	22.5	0-2
				1754.3	20393	20.98	22.5	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	23.16	23.5	0
				836.5	20525	23.33	23.5	0
				844	20600	23.28	23.5	0
			25	829	20450	23.40	23.5	0
				836.5	20525	23.49	23.5	0
				844	20600	23.29	23.5	0
			49	829	20450	23.33	23.5	0
				836.5	20525	23.09	23.5	0
				844	20600	23.17	23.5	0
		25 RB	0	829	20450	22.28	22.5	0-1
				836.5	20525	22.34	22.5	0-1
				844	20600	22.28	22.5	0-1
			12	829	20450	22.33	22.5	0-1
				836.5	20525	22.33	22.5	0-1
				844	20600	22.33	22.5	0-1
			25	829	20450	22.31	22.5	0-1
				836.5	20525	22.36	22.5	0-1
				844	20600	22.21	22.5	0-1
		50RB		829	20450	22.29	22.5	0-1
				836.5	20525	22.37	22.5	0-1
				844	20600	22.27	22.5	0-1
	16-QAM	1 RB	0	829	20450	22.32	22.5	0-1
				836.5	20525	22.37	22.5	0-1
				844	20600	22.42	22.5	0-1
			25	829	20450	22.43	22.5	0-1
				836.5	20525	22.47	22.5	0-1
				844	20600	22.48	22.5	0-1
			49	829	20450	22.34	22.5	0-1
				836.5	20525	22.22	22.5	0-1
				844	20600	22.19	22.5	0-1
		25 RB	0	829	20450	21.17	21.5	0-2
				836.5	20525	21.39	21.5	0-2
				844	20600	21.26	21.5	0-2
			12	829	20450	21.28	21.5	0-2
				836.5	20525	21.39	21.5	0-2
				844	20600	21.39	21.5	0-2
			25	829	20450	21.41	21.5	0-2
				836.5	20525	21.24	21.5	0-2
				844	20600	21.16	21.5	0-2
		500RB		829	20450	21.30	21.5	0-2
				836.5	20525	21.38	21.5	0-2
				844	20600	21.30	21.5	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	23.24	23.5	0
				836.5	20525	23.45	23.5	0
				846.5	20625	23.48	23.5	0
			12	826.5	20425	23.38	23.5	0
				836.5	20525	23.39	23.5	0
				846.5	20625	23.34	23.5	0
			24	826.5	20425	23.48	23.5	0
				836.5	20525	23.43	23.5	0
				846.5	20625	23.47	23.5	0
		12 RB	0	826.5	20425	22.22	22.5	0-1
				836.5	20525	22.34	22.5	0-1
				846.5	20625	22.23	22.5	0-1
			6	826.5	20425	22.27	22.5	0-1
				836.5	20525	22.33	22.5	0-1
				846.5	20625	22.20	22.5	0-1
			13	826.5	20425	22.20	22.5	0-1
				836.5	20525	22.28	22.5	0-1
				846.5	20625	22.16	22.5	0-1
		25RB		826.5	20425	22.25	22.5	0-1
				836.5	20525	22.36	22.5	0-1
				846.5	20625	22.23	22.5	0-1
	16-QAM	1 RB	0	826.5	20425	22.46	22.5	0-1
				836.5	20525	22.07	22.5	0-1
				846.5	20625	22.15	22.5	0-1
			12	826.5	20425	22.13	22.5	0-1
				836.5	20525	21.95	22.5	0-1
				846.5	20625	22.06	22.5	0-1
			24	826.5	20425	22.22	22.5	0-1
				836.5	20525	21.88	22.5	0-1
				846.5	20625	22.24	22.5	0-1
		12 RB	0	826.5	20425	21.30	21.5	0-2
				836.5	20525	21.38	21.5	0-2
				846.5	20625	21.37	21.5	0-2
			6	826.5	20425	21.35	21.5	0-2
				836.5	20525	21.38	21.5	0-2
				846.5	20625	21.24	21.5	0-2
			13	826.5	20425	21.26	21.5	0-2
				836.5	20525	21.35	21.5	0-2
				846.5	20625	21.21	21.5	0-2
		25RB		826.5	20425	21.45	21.5	0-2
				836.5	20525	21.43	21.5	0-2
				846.5	20625	21.41	21.5	0-2

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	23.29	23.5	0
				836.5	20525	23.48	23.5	0
				847.5	20635	23.24	23.5	0
			7	825.5	20415	23.43	23.5	0
				836.5	20525	23.44	23.5	0
				847.5	20635	23.38	23.5	0
			14	825.5	20415	23.31	23.5	0
				836.5	20525	23.46	23.5	0
				847.5	20635	23.28	23.5	0
		8 RB	0	825.5	20415	22.30	22.5	0-1
				836.5	20525	22.39	22.5	0-1
				847.5	20635	22.32	22.5	0-1
			4	825.5	20415	22.28	22.5	0-1
				836.5	20525	22.41	22.5	0-1
				847.5	20635	22.33	22.5	0-1
			7	825.5	20415	22.29	22.5	0-1
				836.5	20525	22.42	22.5	0-1
				847.5	20635	22.25	22.5	0-1
		15RB		825.5	20415	22.22	22.5	0-1
				836.5	20525	22.22	22.5	0-1
				847.5	20635	22.11	22.5	0-1
	16-QAM	1 RB	0	825.5	20415	22.06	22.5	0-1
				836.5	20525	22.42	22.5	0-1
				847.5	20635	21.95	22.5	0-1
			7	825.5	20415	22.07	22.5	0-1
				836.5	20525	22.39	22.5	0-1
				847.5	20635	22.13	22.5	0-1
			14	825.5	20415	22.03	22.5	0-1
				836.5	20525	22.44	22.5	0-1
				847.5	20635	21.91	22.5	0-1
		8 RB	0	825.5	20415	21.38	21.5	0-2
				836.5	20525	21.30	21.5	0-2
				847.5	20635	21.44	21.5	0-2
			4	825.5	20415	21.36	21.5	0-2
				836.5	20525	21.35	21.5	0-2
				847.5	20635	21.48	21.5	0-2
			7	825.5	20415	21.35	21.5	0-2
				836.5	20525	21.33	21.5	0-2
				847.5	20635	21.30	21.5	0-2
		15RB		825.5	20415	21.49	21.5	0-2
				836.5	20525	21.34	21.5	0-2
				847.5	20635	21.38	21.5	0-2

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	23.06	23.5	0
				836.5	20525	23.38	23.5	0
				848.3	20643	23.22	23.5	0
			2	824.7	20407	23.34	23.5	0
				836.5	20525	23.43	23.5	0
				848.3	20643	23.26	23.5	0
			5	824.7	20407	23.03	23.5	0
				836.5	20525	23.48	23.5	0
				848.3	20643	23.14	23.5	0
		3 RB	0	824.7	20407	23.16	23.5	0
				836.5	20525	23.50	23.5	0
				848.3	20643	23.38	23.5	0
			2	824.7	20407	23.31	23.5	0
				836.5	20525	23.44	23.5	0
				848.3	20643	23.29	23.5	0
			3	824.7	20407	23.07	23.5	0
				836.5	20525	23.50	23.5	0
				848.3	20643	23.36	23.5	0
		6RB		824.7	20407	22.20	22.5	0-1
				836.5	20525	22.41	22.5	0-1
				848.3	20643	22.24	22.5	0-1
	16-QAM	1 RB	0	824.7	20407	22.37	22.5	0-1
				836.5	20525	22.41	22.5	0-1
				848.3	20643	22.44	22.5	0-1
			2	824.7	20407	22.44	22.5	0-1
				836.5	20525	22.49	22.5	0-1
				848.3	20643	22.14	22.5	0-1
			5	824.7	20407	22.37	22.5	0-1
				836.5	20525	22.40	22.5	0-1
				848.3	20643	21.98	22.5	0-1
		3 RB	0	824.7	20407	22.44	22.5	0-1
				836.5	20525	22.45	22.5	0-1
				848.3	20643	22.32	22.5	0-1
			2	824.7	20407	22.41	22.5	0-1
				836.5	20525	22.46	22.5	0-1
				848.3	20643	22.26	22.5	0-1
			3	824.7	20407	22.41	22.5	0-1
				836.5	20525	22.41	22.5	0-1
				848.3	20643	22.26	22.5	0-1
		6RB		824.7	20407	21.26	21.5	0-2
				836.5	20525	21.24	21.5	0-2
				848.3	20643	21.19	21.5	0-2

FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	704	23060	23.39	23.5	0
				707.5	23095	23.16	23.5	0
				711	23130	23.37	23.5	0
			25	704	23060	23.46	23.5	0
				707.5	23095	23.40	23.5	0
				711	23130	23.47	23.5	0
			49	704	23060	23.26	23.5	0
				707.5	23095	23.21	23.5	0
				711	23130	23.44	23.5	0
		25 RB	0	704	23060	22.27	22.5	0-1
				707.5	23095	22.18	22.5	0-1
				711	23130	22.40	22.5	0-1
			12	704	23060	22.29	22.5	0-1
				707.5	23095	22.26	22.5	0-1
				711	23130	22.41	22.5	0-1
			25	704	23060	22.32	22.5	0-1
				707.5	23095	22.24	22.5	0-1
				711	23130	22.34	22.5	0-1
		50RB		704	23060	22.31	22.5	0-1
				707.5	23095	22.28	22.5	0-1
				711	23130	22.39	22.5	0-1
	16-QAM	1 RB	0	704	23060	22.46	22.5	0-1
				707.5	23095	22.32	22.5	0-1
				711	23130	22.41	22.5	0-1
			25	704	23060	22.45	22.5	0-1
				707.5	23095	22.40	22.5	0-1
				711	23130	22.45	22.5	0-1
			49	704	23060	22.30	22.5	0-1
				707.5	23095	22.34	22.5	0-1
				711	23130	22.39	22.5	0-1
		25 RB	0	704	23060	21.23	21.5	0-2
				707.5	23095	21.15	21.5	0-2
				711	23130	21.30	21.5	0-2
			12	704	23060	21.26	21.5	0-2
				707.5	23095	21.34	21.5	0-2
				711	23130	21.42	21.5	0-2
			25	704	23060	21.30	21.5	0-2
				707.5	23095	21.15	21.5	0-2
				711	23130	21.17	21.5	0-2
		50RB		704	23060	21.23	21.5	0-2
				707.5	23095	21.20	21.5	0-2
				711	23130	21.38	21.5	0-2

FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	701.5	23035	23.41	23.5	0
				707.5	23095	23.39	23.5	0
				713.5	23155	23.38	23.5	0
			12	701.5	23035	23.38	23.5	0
				707.5	23095	23.31	23.5	0
				713.5	23155	23.36	23.5	0
			24	701.5	23035	23.45	23.5	0
				707.5	23095	23.19	23.5	0
				713.5	23155	23.23	23.5	0
		12 RB	0	701.5	23035	22.25	22.5	0-1
				707.5	23095	22.25	22.5	0-1
				713.5	23155	22.29	22.5	0-1
			6	701.5	23035	22.34	22.5	0-1
				707.5	23095	22.25	22.5	0-1
				713.5	23155	22.30	22.5	0-1
			13	701.5	23035	22.41	22.5	0-1
				707.5	23095	22.30	22.5	0-1
				713.5	23155	22.27	22.5	0-1
		25RB		701.5	23035	22.32	22.5	0-1
				707.5	23095	22.29	22.5	0-1
				713.5	23155	22.24	22.5	0-1
	16-QAM	1 RB	0	701.5	23035	21.74	22.5	0-1
				707.5	23095	22.36	22.5	0-1
				713.5	23155	22.34	22.5	0-1
			12	701.5	23035	21.79	22.5	0-1
				707.5	23095	22.18	22.5	0-1
				713.5	23155	22.15	22.5	0-1
			24	701.5	23035	21.80	22.5	0-1
				707.5	23095	22.49	22.5	0-1
				713.5	23155	22.16	22.5	0-1
		12 RB	0	701.5	23035	21.18	21.5	0-2
				707.5	23095	21.49	21.5	0-2
				713.5	23155	21.25	21.5	0-2
			6	701.5	23035	21.42	21.5	0-2
				707.5	23095	21.40	21.5	0-2
				713.5	23155	21.18	21.5	0-2
			13	701.5	23035	21.40	21.5	0-2
				707.5	23095	21.42	21.5	0-2
				713.5	23155	21.24	21.5	0-2
		25RB		701.5	23035	21.35	21.5	0-2
				707.5	23095	21.20	21.5	0-2
				713.5	23155	21.27	21.5	0-2

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	700.5	23025	23.45	23.5	0
				707.5	23095	23.45	23.5	0
				714.5	23165	23.44	23.5	0
			7	700.5	23025	23.42	23.5	0
				707.5	23095	23.43	23.5	0
				714.5	23165	23.39	23.5	0
			14	700.5	23025	23.26	23.5	0
				707.5	23095	23.34	23.5	0
				714.5	23165	23.43	23.5	0
		8 RB	0	700.5	23025	22.29	22.5	0-1
				707.5	23095	22.18	22.5	0-1
				714.5	23165	22.33	22.5	0-1
			4	700.5	23025	22.43	22.5	0-1
				707.5	23095	22.20	22.5	0-1
				714.5	23165	22.23	22.5	0-1
			7	700.5	23025	22.50	22.5	0-1
				707.5	23095	22.26	22.5	0-1
				714.5	23165	22.32	22.5	0-1
		15RB		700.5	23025	22.42	22.5	0-1
				707.5	23095	22.30	22.5	0-1
				714.5	23165	22.33	22.5	0-1
	16-QAM	1 RB	0	700.5	23025	22.39	22.5	0-1
				707.5	23095	22.23	22.5	0-1
				714.5	23165	21.99	22.5	0-1
			7	700.5	23025	22.23	22.5	0-1
				707.5	23095	21.96	22.5	0-1
				714.5	23165	21.97	22.5	0-1
			14	700.5	23025	22.12	22.5	0-1
				707.5	23095	21.85	22.5	0-1
				714.5	23165	21.94	22.5	0-1
		8 RB	0	700.5	23025	21.45	21.5	0-2
				707.5	23095	21.32	21.5	0-2
				714.5	23165	21.27	21.5	0-2
			4	700.5	23025	21.18	21.5	0-2
				707.5	23095	21.34	21.5	0-2
				714.5	23165	21.26	21.5	0-2
			7	700.5	23025	21.25	21.5	0-2
				707.5	23095	21.41	21.5	0-2
				714.5	23165	21.33	21.5	0-2
		15RB		700.5	23025	21.23	21.5	0-2
				707.5	23095	21.45	21.5	0-2
				714.5	23165	21.23	21.5	0-2

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	699.7	23017	23.30	23.5	0
				707.5	23095	23.29	23.5	0
				715.3	23173	23.10	23.5	0
			2	699.7	23017	23.39	23.5	0
				707.5	23095	23.31	23.5	0
				715.3	23173	23.12	23.5	0
			5	699.7	23017	23.14	23.5	0
				707.5	23095	23.26	23.5	0
				715.3	23173	23.09	23.5	0
		3 RB	0	699.7	23017	23.32	23.5	0
				707.5	23095	23.35	23.5	0
				715.3	23173	23.28	23.5	0
			2	699.7	23017	23.44	23.5	0
				707.5	23095	23.39	23.5	0
				715.3	23173	23.33	23.5	0
			3	699.7	23017	23.42	23.5	0
				707.5	23095	23.44	23.5	0
				715.3	23173	23.28	23.5	0
		6RB		699.7	23017	22.40	22.5	0-1
				707.5	23095	22.33	22.5	0-1
				715.3	23173	22.47	22.5	0-1
	16-QAM	1 RB	0	699.7	23017	21.86	22.5	0-1
				707.5	23095	21.69	22.5	0-1
				715.3	23173	22.29	22.5	0-1
			2	699.7	23017	21.96	22.5	0-1
				707.5	23095	22.29	22.5	0-1
				715.3	23173	22.37	22.5	0-1
			5	699.7	23017	22.16	22.5	0-1
				707.5	23095	22.26	22.5	0-1
				715.3	23173	22.26	22.5	0-1
		3 RB	0	699.7	23017	22.45	22.5	0-1
				707.5	23095	22.42	22.5	0-1
				715.3	23173	22.42	22.5	0-1
			2	699.7	23017	22.45	22.5	0-1
				707.5	23095	22.46	22.5	0-1
				715.3	23173	22.47	22.5	0-1
			3	699.7	23017	22.40	22.5	0-1
				707.5	23095	22.47	22.5	0-1
				715.3	23173	22.27	22.5	0-1
		6RB		699.7	23017	21.20	21.5	0-2
				707.5	23095	21.11	21.5	0-2
				715.3	23173	21.18	21.5	0-2

FDD Band 13								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	782	23230	23.42	23.5	0
			25	782	23230	23.06	23.5	0
			49	782	23230	22.85	23.5	0
		25 RB	0	782	23230	22.10	22.5	0-1
			12	782	23230	22.08	22.5	0-1
			25	782	23230	21.96	22.5	0-1
		50RB		782	23230	21.99	22.5	0-1
	16-QAM	1 RB	0	782	23230	22.07	22.5	0-1
			25	782	23230	22.26	22.5	0-1
			49	782	23230	21.83	22.5	0-1
		25 RB	0	782	23230	21.09	21.5	0-2
			12	782	23230	21.06	21.5	0-2
			25	782	23230	21.06	21.5	0-2
		50RB		782	23230	21.13	21.5	0-2

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FDD Band 13								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	779.5	23205	23.11	23.5	0
				782	23230	23.20	23.5	0
				784.5	23255	22.93	23.5	0
			12	779.5	23205	23.40	23.5	0
				782	23230	23.29	23.5	0
				784.5	23255	23.05	23.5	0
			24	779.5	23205	23.12	23.5	0
				782	23230	23.00	23.5	0
				784.5	23255	22.98	23.5	0
		12 RB	0	779.5	23205	22.14	22.5	0-1
				782	23230	22.17	22.5	0-1
				784.5	23255	21.99	22.5	0-1
			6	779.5	23205	22.17	22.5	0-1
				782	23230	22.09	22.5	0-1
				784.5	23255	21.98	22.5	0-1
			13	779.5	23205	22.14	22.5	0-1
				782	23230	21.93	22.5	0-1
				784.5	23255	21.98	22.5	0-1
		25RB		779.5	23205	22.07	22.5	0-1
				782	23230	22.03	22.5	0-1
				784.5	23255	21.97	22.5	0-1
	16-QAM	1 RB	0	779.5	23205	21.76	22.5	0-1
				782	23230	21.80	22.5	0-1
				784.5	23255	21.71	22.5	0-1
			12	779.5	23205	21.75	22.5	0-1
				782	23230	21.91	22.5	0-1
				784.5	23255	21.54	22.5	0-1
			24	779.5	23205	22.00	22.5	0-1
				782	23230	21.78	22.5	0-1
				784.5	23255	21.66	22.5	0-1
		12 RB	0	779.5	23205	21.04	21.5	0-2
				782	23230	21.18	21.5	0-2
				784.5	23255	20.99	21.5	0-2
			6	779.5	23205	21.10	21.5	0-2
				782	23230	21.01	21.5	0-2
				784.5	23255	20.99	21.5	0-2
			13	779.5	23205	21.16	21.5	0-2
				782	23230	20.94	21.5	0-2
				784.5	23255	21.00	21.5	0-2
		25RB		779.5	23205	21.38	21.5	0-2
				782	23230	21.25	21.5	0-2
				784.5	23255	21.27	21.5	0-2

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LTE FDD Band 2 / Band 4 power table (Reduced power):

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	17.41	18	0
				1880	18900	17.31	18	0
				1900	19100	17.34	18	0
			50	1860	18700	17.41	18	0
				1880	18900	17.46	18	0
				1900	19100	17.37	18	0
			99	1860	18700	17.10	18	0
				1880	18900	17.49	18	0
				1900	19100	17.30	18	0
		50 RB	0	1860	18700	17.48	18	0
				1880	18900	17.42	18	0
				1900	19100	17.46	18	0
			25	1860	18700	17.47	18	0
				1880	18900	17.41	18	0
				1900	19100	17.48	18	0
			50	1860	18700	17.46	18	0
				1880	18900	17.40	18	0
				1900	19100	17.42	18	0
		100RB		1860	18700	17.39	18	0
				1880	18900	17.47	18	0
				1900	19100	17.44	18	0
	16-QAM	1 RB	0	1860	18700	17.45	18	0
				1880	18900	17.36	18	0
				1900	19100	17.42	18	0
			50	1860	18700	17.43	18	0
				1880	18900	17.45	18	0
				1900	19100	17.45	18	0
			99	1860	18700	17.30	18	0
				1880	18900	17.48	18	0
				1900	19100	17.48	18	0
		50 RB	0	1860	18700	17.44	18	0
				1880	18900	17.44	18	0
				1900	19100	17.47	18	0
			25	1860	18700	17.45	18	0
				1880	18900	17.42	18	0
				1900	19100	17.46	18	0
			50	1860	18700	17.42	18	0
				1880	18900	17.42	18	0
				1900	19100	17.47	18	0
		100RB		1860	18700	17.43	18	0
				1880	18900	17.41	18	0
				1900	19100	17.42	18	0

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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	17.42	18	0
				1880	18900	17.39	18	0
				1902.5	19125	17.45	18	0
			36	1857.5	18675	17.30	18	0
				1880	18900	17.28	18	0
				1902.5	19125	17.11	18	0
			74	1857.5	18675	17.42	18	0
				1880	18900	17.45	18	0
				1902.5	19125	17.27	18	0
		36 RB	0	1857.5	18675	17.46	18	0
				1880	18900	17.32	18	0
				1902.5	19125	17.40	18	0
			18	1857.5	18675	17.48	18	0
				1880	18900	17.34	18	0
				1902.5	19125	17.43	18	0
			37	1857.5	18675	17.32	18	0
				1880	18900	17.45	18	0
				1902.5	19125	17.45	18	0
		75RB		1857.5	18675	17.48	18	0
				1880	18900	17.40	18	0
				1902.5	19125	17.42	18	0
	16-QAM	1 RB	0	1857.5	18675	17.40	18	0
				1880	18900	17.42	18	0
				1902.5	19125	17.27	18	0
			36	1857.5	18675	17.45	18	0
				1880	18900	17.31	18	0
				1902.5	19125	17.21	18	0
			74	1857.5	18675	17.47	18	0
				1880	18900	17.41	18	0
				1902.5	19125	17.28	18	0
		36 RB	0	1857.5	18675	17.42	18	0
				1880	18900	17.34	18	0
				1902.5	19125	17.38	18	0
			18	1857.5	18675	17.44	18	0
				1880	18900	17.17	18	0
				1902.5	19125	17.40	18	0
			37	1857.5	18675	17.48	18	0
				1880	18900	17.28	18	0
				1902.5	19125	17.42	18	0
		75RB		1857.5	18675	17.45	18	0
				1880	18900	17.34	18	0
				1902.5	19125	17.48	18	0

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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	17.30	18	0
				1880	18900	17.26	18	0
				1905	19150	17.41	18	0
			25	1855	18650	17.48	18	0
				1880	18900	17.33	18	0
				1905	19150	17.45	18	0
			49	1855	18650	17.21	18	0
				1880	18900	17.40	18	0
				1905	19150	17.46	18	0
		25 RB	0	1855	18650	17.42	18	0
				1880	18900	17.42	18	0
				1905	19150	17.47	18	0
			12	1855	18650	17.47	18	0
				1880	18900	17.38	18	0
				1905	19150	17.44	18	0
			25	1855	18650	17.34	18	0
				1880	18900	17.30	18	0
				1905	19150	17.41	18	0
		50RB		1855	18650	17.48	18	0
				1880	18900	17.31	18	0
				1905	19150	17.45	18	0
	16-QAM	1 RB	0	1855	18650	17.41	18	0
				1880	18900	17.48	18	0
				1905	19150	17.48	18	0
			25	1855	18650	17.46	18	0
				1880	18900	17.48	18	0
				1905	19150	17.40	18	0
			49	1855	18650	17.48	18	0
				1880	18900	17.46	18	0
				1905	19150	17.36	18	0
		25 RB	0	1855	18650	17.39	18	0
				1880	18900	17.40	18	0
				1905	19150	17.43	18	0
			12	1855	18650	17.43	18	0
				1880	18900	17.47	18	0
				1905	19150	17.48	18	0
			25	1855	18650	17.31	18	0
				1880	18900	17.48	18	0
				1905	19150	17.45	18	0
		50RB		1855	18650	17.48	18	0
				1880	18900	17.34	18	0
				1905	19150	17.42	18	0

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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	17.43	18	0
				1880	18900	17.45	18	0
				1907.5	19175	17.39	18	0
			12	1852.5	18625	17.41	18	0
				1880	18900	17.41	18	0
				1907.5	19175	17.48	18	0
			24	1852.5	18625	17.48	18	0
				1880	18900	17.47	18	0
				1907.5	19175	17.45	18	0
		12 RB	0	1852.5	18625	17.39	18	0
				1880	18900	17.32	18	0
				1907.5	19175	17.31	18	0
			6	1852.5	18625	17.31	18	0
				1880	18900	17.23	18	0
				1907.5	19175	17.39	18	0
			13	1852.5	18625	17.46	18	0
				1880	18900	17.34	18	0
				1907.5	19175	17.36	18	0
		25RB		1852.5	18625	17.37	18	0
				1880	18900	17.31	18	0
				1907.5	19175	17.30	18	0
	16-QAM	1 RB	0	1852.5	18625	17.47	18	0
				1880	18900	17.47	18	0
				1907.5	19175	17.41	18	0
			12	1852.5	18625	17.36	18	0
				1880	18900	17.39	18	0
				1907.5	19175	17.45	18	0
			24	1852.5	18625	17.21	18	0
				1880	18900	17.46	18	0
				1907.5	19175	17.34	18	0
		12 RB	0	1852.5	18625	17.39	18	0
				1880	18900	17.30	18	0
				1907.5	19175	17.24	18	0
			6	1852.5	18625	17.41	18	0
				1880	18900	17.31	18	0
				1907.5	19175	17.41	18	0
			13	1852.5	18625	17.45	18	0
				1880	18900	17.40	18	0
				1907.5	19175	17.47	18	0
		25RB		1852.5	18625	17.47	18	0
				1880	18900	17.37	18	0
				1907.5	19175	17.44	18	0

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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	17.36	18	0
				1880	18900	17.39	18	0
				1908.5	19185	17.39	18	0
			7	1851.5	18615	17.42	18	0
				1880	18900	17.38	18	0
				1908.5	19185	17.48	18	0
			14	1851.5	18615	17.37	18	0
				1880	18900	17.40	18	0
				1908.5	19185	17.47	18	0
		8 RB	0	1851.5	18615	17.36	18	0
				1880	18900	17.38	18	0
				1908.5	19185	17.43	18	0
			4	1851.5	18615	17.35	18	0
				1880	18900	17.42	18	0
				1908.5	19185	17.38	18	0
			7	1851.5	18615	17.46	18	0
				1880	18900	17.41	18	0
				1908.5	19185	17.40	18	0
		15RB		1851.5	18615	17.47	18	0
				1880	18900	17.44	18	0
				1908.5	19185	17.38	18	0
	16-QAM	1 RB	0	1851.5	18615	17.44	18	0
				1880	18900	17.42	18	0
				1908.5	19185	17.40	18	0
			7	1851.5	18615	17.46	18	0
				1880	18900	17.48	18	0
				1908.5	19185	17.47	18	0
			14	1851.5	18615	17.44	18	0
				1880	18900	17.42	18	0
				1908.5	19185	17.46	18	0
		8 RB	0	1851.5	18615	17.23	18	0
				1880	18900	17.16	18	0
				1908.5	19185	17.17	18	0
			4	1851.5	18615	17.23	18	0
				1880	18900	17.04	18	0
				1908.5	19185	17.16	18	0
			7	1851.5	18615	17.21	18	0
				1880	18900	17.11	18	0
				1908.5	19185	17.19	18	0
		15RB		1851.5	18615	17.21	18	0
				1880	18900	17.06	18	0
				1908.5	19185	17.24	18	0

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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	17.45	18	0
				1880	18900	17.33	18	0
				1909.3	19193	17.44	18	0
			2	1850.7	18607	17.46	18	0
				1880	18900	17.39	18	0
				1909.3	19193	17.47	18	0
			5	1850.7	18607	17.44	18	0
				1880	18900	17.32	18	0
				1909.3	19193	17.44	18	0
		3 RB	0	1850.7	18607	17.41	18	0
				1880	18900	17.43	18	0
				1909.3	19193	17.46	18	0
			2	1850.7	18607	17.45	18	0
				1880	18900	17.39	18	0
				1909.3	19193	17.48	18	0
			3	1850.7	18607	17.42	18	0
				1880	18900	17.48	18	0
				1909.3	19193	17.45	18	0
		6RB		1850.7	18607	17.43	18	0
				1880	18900	17.46	18	0
				1909.3	19193	17.45	18	0
	16-QAM	1 RB	0	1850.7	18607	17.47	18	0
				1880	18900	17.43	18	0
				1909.3	19193	17.38	18	0
			2	1850.7	18607	17.43	18	0
				1880	18900	17.44	18	0
				1909.3	19193	17.35	18	0
			5	1850.7	18607	17.48	18	0
				1880	18900	17.45	18	0
				1909.3	19193	17.28	18	0
		3 RB	0	1850.7	18607	17.43	18	0
				1880	18900	17.41	18	0
				1909.3	19193	17.29	18	0
			2	1850.7	18607	17.46	18	0
				1880	18900	17.36	18	0
				1909.3	19193	17.46	18	0
			3	1850.7	18607	17.42	18	0
				1880	18900	17.33	18	0
				1909.3	19193	17.47	18	0
		6RB		1850.7	18607	17.27	18	0
				1880	18900	17.17	18	0
				1909.3	19193	17.08	18	0

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	17.78	18.5	0
				1732.5	20175	17.51	18.5	0
				1745	20300	17.42	18.5	0
			50	1720	20050	17.44	18.5	0
				1732.5	20175	17.56	18.5	0
				1745	20300	17.36	18.5	0
			99	1720	20050	17.14	18.5	0
				1732.5	20175	17.17	18.5	0
				1745	20300	17.22	18.5	0
		50 RB	0	1720	20050	17.45	18.5	0
				1732.5	20175	17.53	18.5	0
				1745	20300	17.49	18.5	0
			25	1720	20050	17.40	18.5	0
				1732.5	20175	17.54	18.5	0
				1745	20300	17.45	18.5	0
			50	1720	20050	17.39	18.5	0
				1732.5	20175	17.49	18.5	0
				1745	20300	17.36	18.5	0
		100RB		1720	20050	17.48	18.5	0
				1732.5	20175	17.59	18.5	0
				1745	20300	17.44	18.5	0
	16-QAM	1 RB	0	1720	20050	17.41	18.5	0
				1732.5	20175	17.59	18.5	0
				1745	20300	17.38	18.5	0
			50	1720	20050	17.60	18.5	0
				1732.5	20175	17.51	18.5	0
				1745	20300	17.53	18.5	0
			99	1720	20050	17.29	18.5	0
				1732.5	20175	17.62	18.5	0
				1745	20300	17.28	18.5	0
		50 RB	0	1720	20050	17.50	18.5	0
				1732.5	20175	17.49	18.5	0
				1745	20300	17.45	18.5	0
			25	1720	20050	17.37	18.5	0
				1732.5	20175	17.41	18.5	0
				1745	20300	17.41	18.5	0
			50	1720	20050	17.42	18.5	0
				1732.5	20175	17.37	18.5	0
				1745	20300	17.25	18.5	0
		100RB		1720	20050	17.46	18.5	0
				1732.5	20175	17.49	18.5	0
				1745	20300	17.53	18.5	0

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	17.52	18.5	0
				1732.5	20175	17.51	18.5	0
				1747.5	20325	17.58	18.5	0
			36	1717.5	20025	17.30	18.5	0
				1732.5	20175	17.30	18.5	0
				1747.5	20325	17.26	18.5	0
			74	1717.5	20025	17.25	18.5	0
				1732.5	20175	17.32	18.5	0
				1747.5	20325	17.45	18.5	0
		36 RB	0	1717.5	20025	17.58	18.5	0
				1732.5	20175	17.53	18.5	0
				1747.5	20325	17.48	18.5	0
			18	1717.5	20025	17.33	18.5	0
				1732.5	20175	17.57	18.5	0
				1747.5	20325	17.45	18.5	0
			37	1717.5	20025	17.32	18.5	0
				1732.5	20175	17.56	18.5	0
				1747.5	20325	17.41	18.5	0
		75RB		1717.5	20025	17.37	18.5	0
				1732.5	20175	17.50	18.5	0
				1747.5	20325	17.50	18.5	0
	16-QAM	1 RB	0	1717.5	20025	17.57	18.5	0
				1732.5	20175	17.32	18.5	0
				1747.5	20325	17.57	18.5	0
			36	1717.5	20025	17.56	18.5	0
				1732.5	20175	17.62	18.5	0
				1747.5	20325	17.33	18.5	0
			74	1717.5	20025	17.45	18.5	0
				1732.5	20175	17.64	18.5	0
				1747.5	20325	17.47	18.5	0
		36 RB	0	1717.5	20025	17.45	18.5	0
				1732.5	20175	17.50	18.5	0
				1747.5	20325	17.53	18.5	0
			18	1717.5	20025	17.24	18.5	0
				1732.5	20175	17.55	18.5	0
				1747.5	20325	17.51	18.5	0
			37	1717.5	20025	17.31	18.5	0
				1732.5	20175	17.44	18.5	0
				1747.5	20325	17.46	18.5	0
		75RB		1717.5	20025	17.39	18.5	0
				1732.5	20175	17.52	18.5	0
				1747.5	20325	17.43	18.5	0

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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	17.47	18.5	0
				1732.5	20175	17.36	18.5	0
				1750	20350	17.54	18.5	0
			25	1715	20000	17.77	18.5	0
				1732.5	20175	17.50	18.5	0
				1750	20350	17.67	18.5	0
			49	1715	20000	17.37	18.5	0
				1732.5	20175	17.19	18.5	0
				1750	20350	17.57	18.5	0
		25 RB	0	1715	20000	17.52	18.5	0
				1732.5	20175	17.58	18.5	0
				1750	20350	17.47	18.5	0
			12	1715	20000	17.52	18.5	0
				1732.5	20175	17.57	18.5	0
				1750	20350	17.59	18.5	0
			25	1715	20000	17.37	18.5	0
				1732.5	20175	17.50	18.5	0
				1750	20350	17.61	18.5	0
		50RB		1715	20000	17.51	18.5	0
				1732.5	20175	17.55	18.5	0
				1750	20350	17.50	18.5	0
	16-QAM	1 RB	0	1715	20000	17.49	18.5	0
				1732.5	20175	17.57	18.5	0
				1750	20350	17.66	18.5	0
			25	1715	20000	17.47	18.5	0
				1732.5	20175	17.66	18.5	0
				1750	20350	17.49	18.5	0
			49	1715	20000	17.62	18.5	0
				1732.5	20175	17.59	18.5	0
				1750	20350	17.62	18.5	0
		25 RB	0	1715	20000	17.66	18.5	0
				1732.5	20175	17.62	18.5	0
				1750	20350	17.54	18.5	0
			12	1715	20000	17.68	18.5	0
				1732.5	20175	17.63	18.5	0
				1750	20350	17.54	18.5	0
			25	1715	20000	17.44	18.5	0
				1732.5	20175	17.55	18.5	0
				1750	20350	17.67	18.5	0
		50RB		1715	20000	17.56	18.5	0
				1732.5	20175	17.50	18.5	0
				1750	20350	17.55	18.5	0

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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	17.31	18.5	0
				1732.5	20175	17.51	18.5	0
				1752.5	20375	17.30	18.5	0
			12	1712.5	19975	17.29	18.5	0
				1732.5	20175	17.44	18.5	0
				1752.5	20375	17.53	18.5	0
			24	1712.5	19975	17.33	18.5	0
				1732.5	20175	17.45	18.5	0
				1752.5	20375	17.40	18.5	0
		12 RB	0	1712.5	19975	17.39	18.5	0
				1732.5	20175	17.39	18.5	0
				1752.5	20375	17.48	18.5	0
			6	1712.5	19975	17.36	18.5	0
				1732.5	20175	17.45	18.5	0
				1752.5	20375	17.56	18.5	0
			13	1712.5	19975	17.39	18.5	0
				1732.5	20175	17.46	18.5	0
				1752.5	20375	17.57	18.5	0
		25RB		1712.5	19975	17.42	18.5	0
				1732.5	20175	17.40	18.5	0
				1752.5	20375	17.61	18.5	0
	16-QAM	1 RB	0	1712.5	19975	17.62	18.5	0
				1732.5	20175	17.52	18.5	0
				1752.5	20375	17.68	18.5	0
			12	1712.5	19975	17.51	18.5	0
				1732.5	20175	17.61	18.5	0
				1752.5	20375	17.49	18.5	0
			24	1712.5	19975	17.54	18.5	0
				1732.5	20175	17.65	18.5	0
				1752.5	20375	17.74	18.5	0
		12 RB	0	1712.5	19975	17.25	18.5	0
				1732.5	20175	17.25	18.5	0
				1752.5	20375	17.44	18.5	0
			6	1712.5	19975	17.23	18.5	0
				1732.5	20175	17.34	18.5	0
				1752.5	20375	17.41	18.5	0
			13	1712.5	19975	17.28	18.5	0
				1732.5	20175	17.43	18.5	0
				1752.5	20375	17.42	18.5	0
		25RB		1712.5	19975	17.37	18.5	0
				1732.5	20175	17.45	18.5	0
				1752.5	20375	17.45	18.5	0

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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	17.46	18.5	0
				1732.5	20175	17.57	18.5	0
				1753.5	20385	17.63	18.5	0
			7	1711.5	19965	17.75	18.5	0
				1732.5	20175	17.71	18.5	0
				1753.5	20385	17.69	18.5	0
			14	1711.5	19965	17.57	18.5	0
				1732.5	20175	17.62	18.5	0
				1753.5	20385	17.62	18.5	0
		8 RB	0	1711.5	19965	17.45	18.5	0
				1732.5	20175	17.50	18.5	0
				1753.5	20385	17.47	18.5	0
			4	1711.5	19965	17.48	18.5	0
				1732.5	20175	17.45	18.5	0
				1753.5	20385	17.57	18.5	0
			7	1711.5	19965	17.44	18.5	0
				1732.5	20175	17.46	18.5	0
				1753.5	20385	17.53	18.5	0
		15RB		1711.5	19965	17.45	18.5	0
				1732.5	20175	17.43	18.5	0
				1753.5	20385	17.61	18.5	0
	16-QAM	1 RB	0	1711.5	19965	17.59	18.5	0
				1732.5	20175	17.60	18.5	0
				1753.5	20385	17.66	18.5	0
			7	1711.5	19965	17.48	18.5	0
				1732.5	20175	17.53	18.5	0
				1753.5	20385	17.59	18.5	0
			14	1711.5	19965	17.62	18.5	0
				1732.5	20175	17.57	18.5	0
				1753.5	20385	17.55	18.5	0
		8 RB	0	1711.5	19965	17.16	18.5	0
				1732.5	20175	17.53	18.5	0
				1753.5	20385	17.48	18.5	0
			4	1711.5	19965	17.38	18.5	0
				1732.5	20175	17.46	18.5	0
				1753.5	20385	17.62	18.5	0
			7	1711.5	19965	17.48	18.5	0
				1732.5	20175	17.39	18.5	0
				1753.5	20385	17.67	18.5	0
		15RB		1711.5	19965	17.41	18.5	0
				1732.5	20175	17.49	18.5	0
				1753.5	20385	17.72	18.5	0

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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	17.47	18.5	0
				1732.5	20175	17.37	18.5	0
				1754.3	20393	17.41	18.5	0
			2	1710.7	19957	17.36	18.5	0
				1732.5	20175	17.38	18.5	0
				1754.3	20393	17.59	18.5	0
			5	1710.7	19957	17.31	18.5	0
				1732.5	20175	17.33	18.5	0
				1754.3	20393	17.51	18.5	0
		3 RB	0	1710.7	19957	17.33	18.5	0
				1732.5	20175	17.39	18.5	0
				1754.3	20393	17.46	18.5	0
			2	1710.7	19957	17.43	18.5	0
				1732.5	20175	17.36	18.5	0
				1754.3	20393	17.58	18.5	0
			3	1710.7	19957	17.45	18.5	0
				1732.5	20175	17.43	18.5	0
				1754.3	20393	17.53	18.5	0
		6RB		1710.7	19957	17.41	18.5	0
				1732.5	20175	17.37	18.5	0
				1754.3	20393	17.55	18.5	0
	16-QAM	1 RB	0	1710.7	19957	17.51	18.5	0
				1732.5	20175	17.63	18.5	0
				1754.3	20393	17.74	18.5	0
			2	1710.7	19957	17.72	18.5	0
				1732.5	20175	17.42	18.5	0
				1754.3	20393	17.52	18.5	0
			5	1710.7	19957	17.57	18.5	0
				1732.5	20175	17.37	18.5	0
				1754.3	20393	17.51	18.5	0
		3 RB	0	1710.7	19957	17.39	18.5	0
				1732.5	20175	17.46	18.5	0
				1754.3	20393	17.44	18.5	0
			2	1710.7	19957	17.36	18.5	0
				1732.5	20175	17.28	18.5	0
				1754.3	20393	17.51	18.5	0
			3	1710.7	19957	17.26	18.5	0
				1732.5	20175	17.43	18.5	0
				1754.3	20393	17.34	18.5	0
		6RB		1710.7	19957	17.24	18.5	0
				1732.5	20175	17.41	18.5	0
				1754.3	20393	17.25	18.5	0

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

Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2450 MHz	802.11b	1	2412	1Mbps	19.50	17.75
		6	2437		19.50	17.88
		11	2462		19.50	17.96
	802.11g	1	2412	6Mbps	14.50	12.76
		2	2417		17.50	15.87
		6	2437		17.50	15.71
		10	2457		17.50	15.78
		11	2462		14.50	12.92
	802.11n-HT20	1	2412	MCS0	14.50	12.80
		2	2417		17.50	15.92
		6	2437		17.50	15.77
		10	2457		17.50	15.78
		11	2462		14.50	12.96

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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	14.50	12.54
		40	5200		14.50	12.53
		44	5220		14.50	12.67
		48	5240		14.50	12.62
	802.11n-HT20	36	5180	MCS0	14.50	12.56
		40	5200		14.50	12.55
		44	5220		14.50	12.60
		48	5240		14.50	12.75
	802.11n-HT40	38	5190	MCS0	14.50	12.55
		46	5230		14.50	12.83

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	17.50	15.67
		56	5280		17.50	15.65
		60	5300		17.50	15.75
		64	5320		14.50	12.55
	802.11n-HT20	52	5260	MCS0	16.50	14.77
		56	5280		16.50	14.73
		60	5300		16.50	14.74
		64	5320		14.50	12.73
	802.11n-HT40	54	5270	MCS0	14.50	12.93
		62	5310		14.50	12.86

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5600 MHz	802.11a	100	5500	6Mbps	14.50	12.87
		104	5520		17.50	15.76
		116	5580		17.50	15.81
		120	5600		17.50	15.61
		124	5620		17.50	15.59
		128	5640		17.50	15.54
		136	5680		17.50	15.79
		140	5700		14.50	12.88
	802.11n-HT20	100	5500	MCS0	14.50	12.79
		104	5520		16.50	14.83
		116	5580		16.50	14.84
		120	5600		16.50	14.75
		124	5620		16.50	14.79
		128	5640		16.50	14.68
		136	5680		16.50	14.81
		140	5700		14.50	12.98
	802.11n-HT40	102	5510	MCS0	14.50	12.52
		110	5550		14.50	12.53
		118	5590		14.50	12.50
		126	5630		14.50	12.50
		134	5670		14.50	12.51
		142	5710		14.50	12.52

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Mode	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5800 MHz	802.11a	149	5745	6Mbps	17.50	15.76
		157	5785		17.50	15.56
		165	5825		17.50	15.77
	802.11n-HT20	149	5745	MCS0	16.50	14.80
		157	5785		16.50	14.59
		165	5825		16.50	14.86
	802.11n-HT40	151	5755	MCS0	14.50	12.59
		159	5795		14.50	12.64

Bluetooth conducted power table:

Mode	Channel	Frequency (MHz)	1Mbps	2Mbps	3Mbps	Max. Rated Avg. Power + Max. Tolerance (dBm)
			Average power (dBm)	Average power (dBm)	Average power (dBm)	
BR/EDR	CH 00	2402	9.66	7.49	7.49	11.6
	CH 39	2441	8.95	7.40	7.41	
	CH 78	2480	8.15	6.22	6.24	

Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg.Power + Max. Tolerance (dBm)	Average Output Power (dBm)
LE	CH 00	2402	2.7	0.81
	CH 20	2442		0.38
	CH 39	2480		-1.08

1.4 Test Environment

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

1.5 Operation Description

For WWAN, the EUT is controlled by using a Radio Communication Tester, and the communication between the EUT and the tester is established by air link.
For WLAN, using chipset specific software to control the EUT, and makes it transmit in maximum power. The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.

Based on KDB inquiry, proceed full test the Standard model without scanner, then worst cases test Landscape scanner and Portrait scanner.

WWAN

WCDMA BII / LTE B2/4 (p-sensor)

Back/top_0mm with power reduction

Back_11mm / top_11mm / bottom/right/Left sides_0mm with full power

WCDMA BV / LTE B5/12/13

Back/top/bottom/right/Left sides_0mm with full power

WLAN

Back/top/bottom/right/left sides_0mm with full power

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Note:

1. 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.

2. 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).

3. 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 in a secondary mode (HSPA) is ≤ ¼ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA).

4. 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

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- 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.

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802.11b DSSS SAR Test Requirements:

5. 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.
6. 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:

7. 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.

Initial Test Configuration:

8. An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band.
9. SAR is measured using the highest measured maximum output power channel. When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
10. Since the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified

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maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for subsequent test configuration.

11. According to KDB447498D01v06, SAR test exclusion evaluation for surfaces/edges of tablet is not required since SAR measurements for all the surfaces/edges were performed.
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 ≤ 100 MHz.
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)

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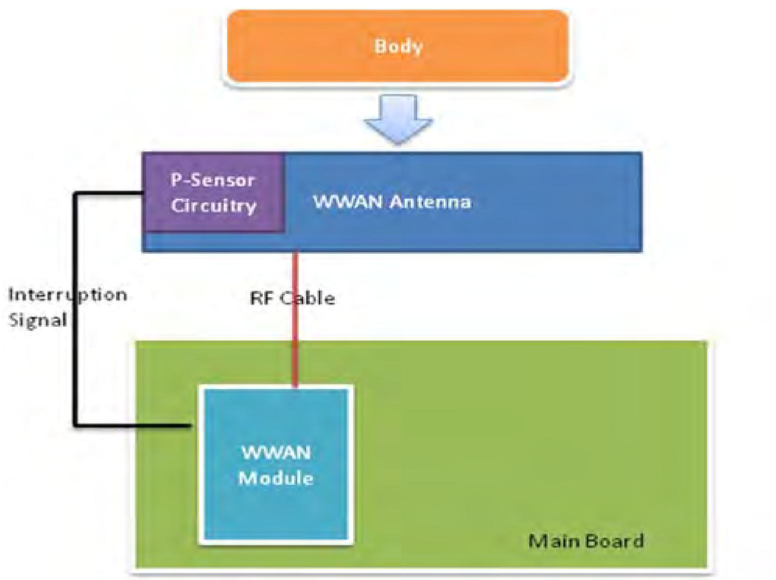
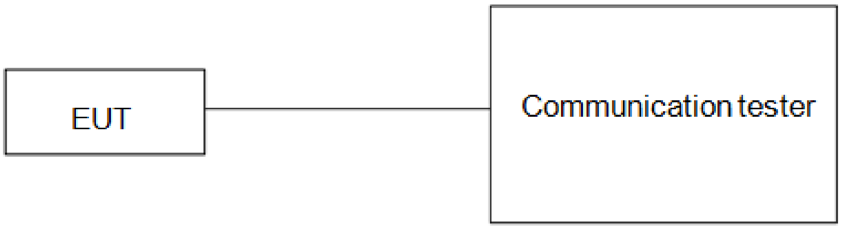
1.6 Proximity sensor operation description

The P-sensor being used to reduce output power is capacitive in which when the object such as human body, metal or plastic is being approached, the sensing capacitance would be increased with the antenna pad. Once the capacitance is accumulated, and reached over the threshold as set in MCU of the microchip, the interruption signal is pulled low (High state without trigger) and further inform modem module of the transmitter to make power reduction.



1.6.1 Proximity sensor measurement procedure

1. The proximity sensor is collocated with WWAN antenna.
2. Output power is measured, and monitored by using the communication tester. A RF cables with sufficient length was being attached from the antenna port of the module, and used for the measurement. The appropriate loss attenuated from cable is compensated in the communication tester.



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1.6.2 Trigger distances for back/top side

Test procedure:

1. The entire back surface or edge of the tablet is positioned below a flat phantom filled with the required tissue equivalent medium and positioned at least 20 mm further than the distance that triggers power reduction.

2. The back surface or edge is moved toward the phantom in 3 mm steps until the sensor triggers.

3. The back surface or edge is again moved toward the phantom, but in 1 mm steps, until it is at least 5 mm past the triggering point or touching the phantom

4. If the tablet is not touching the phantom, it is moved in 3 mm steps until it touches the phantom to confirm that the sensor remains triggered and the maximum power stays reduced.

5. The back surface or edge is then moved back (further away) from the phantom until maximum output power is returned to the normal maximum level.

6. The process is then reversed by moving the tablet away from the phantom to determine triggering release, until it is at least 10 mm beyond the point that triggers the return of normal maximum power.

7. The measured output power within ± 5 mm of the triggering points, or until the tablet is touching the phantom, for movements to and from the phantom should be tabulated.

8. To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for movements to and from the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.

9. For back side, the worst trigger distance of proximity sensor is 12mm.

10. For top side, the worst trigger distance of proximity sensor is 14mm, and we perform the 1.6.3 tilt angle testing in next step.

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1.6.3 Tilt angle testing

Test procedure:

1. The influence of table tilt angles to proximity sensor triggering is determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at the smallest sensor triggering test distance determined in sections 1.6.2 by rotating the tablet around the edge next to the phantom in ≤ 10 deg increments until the tablet is +/- 45deg or more from the vertical position at 0 deg.

2. If sensor triggering is released and normal maximum output power is restored within the +/- 45deg range, the procedures in step 1) should be repeated by reducing the tablet to phantom separation distance by 1 mm until the proximity sensor no longer releases triggering, and maximum output power remains in the reduced mode.

3. The smallest separation distance determined in steps 1) and 2), minus 1 mm, is the sensor triggering distance for tablet tilt coverage. The smallest separation distance determined in sections 1.6.2, 1.6.3 minus 1 mm should be used in the SAR measurements.

4. The influence of tablet tilt angles to proximity sensor triggering is determined by positioning top and right sides, please refer to table 1.6.5 and 1.6.6.

5. After the tilt angle testing for top side, the sensor is released during +/- 45deg until 12mm, so 12-1=11mm should be used in the SAR measurements.

1.6.4 Proximity sensor coverage

The following procedures do not apply and are not required for configurations where the antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

Test procedure:

1. The back surface or edges of the tablet is positioned at a test separation distance less than or equal to the distance required for back surface or edge triggering, with both the antenna and sensor pad located at least 20 mm laterally outside the edge (boundary) of the phantom, along the direction of maximum antenna and sensor offset.

2. The similar sequence of steps applied to determine sensor triggering distance in section 1.6.2 are used to verify back surface and edge sensor coverage by moving the tablet (sensor and antenna) horizontally toward the phantom while maintaining the same vertical separation between the back surface or edge and the phantom.

3. After the exact location where triggering of power reduction is determined, with respect to the sensor and antenna, the tablet movement should be continued, in 3 mm increments, until both the sensor and antenna(s) are fully under the phantom and at least 20 mm inside the phantom edge.

4. The process is then repeated from the other direction, at the opposite end of maximum antenna and sensor offset, by rotating the tablet 180 degrees.

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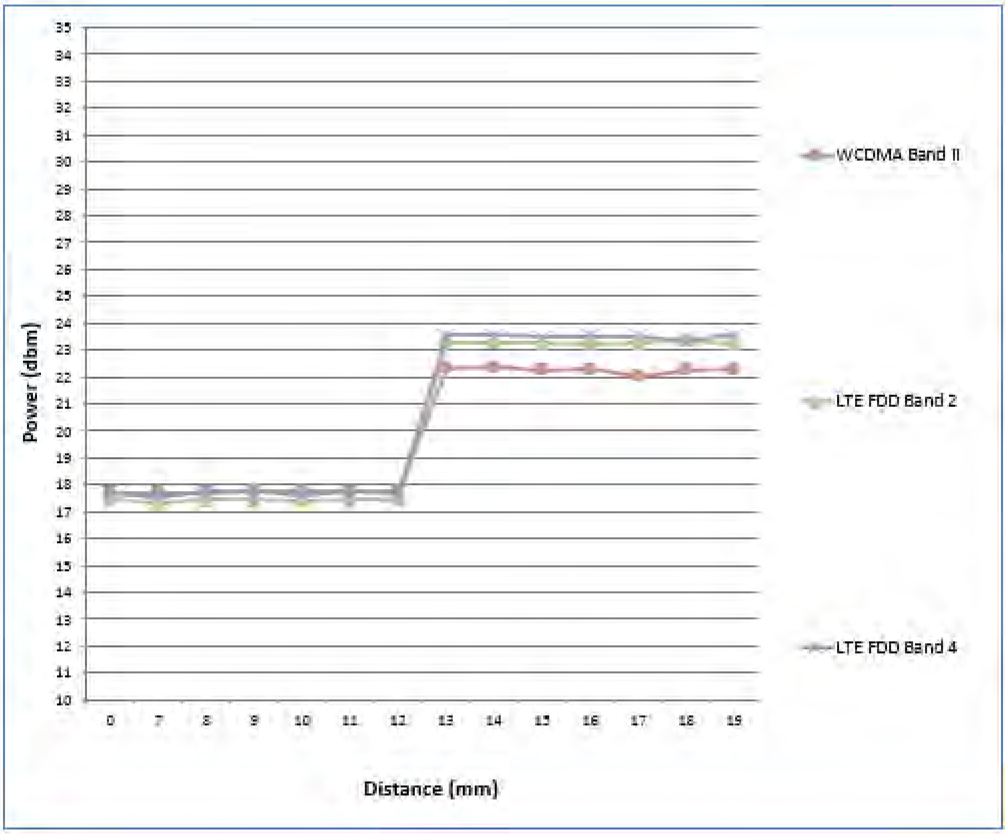
1.6.5 Results

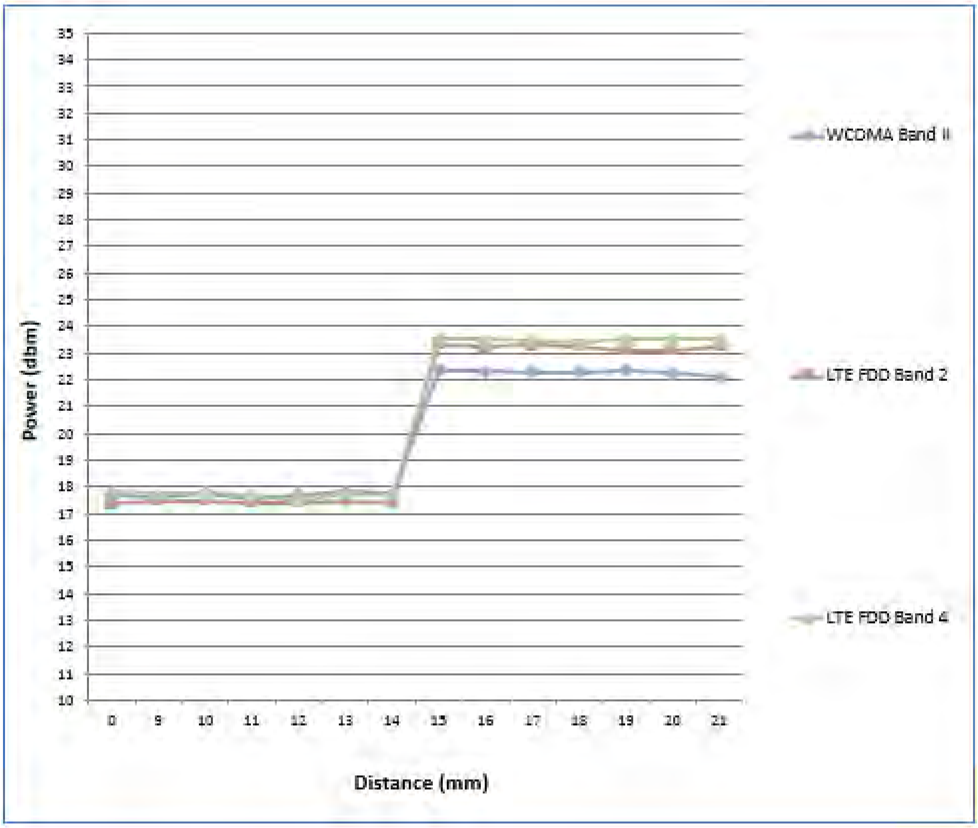
The measured output power within ± 5 mm of the triggering points, or until the tablet is touching the phantom, for movements to and from the phantom is tabulated in the following.

Back side

Moving device toward the phantom



Moving device away from the phantom



For back side, the worst trigger distance of proximity sensor is 12mm, and we tested backside SAR in 11mm with full power and 0mm with reduced power.

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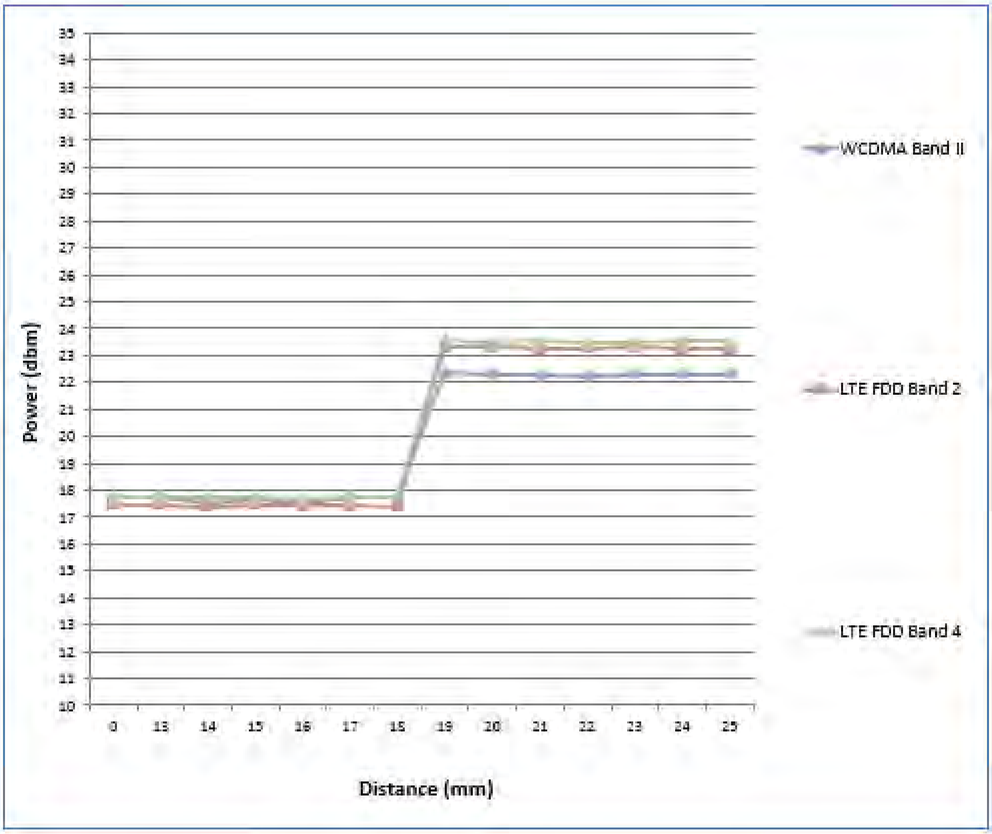
Top side

Moving device toward the phantom



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Moving device away from the phantom

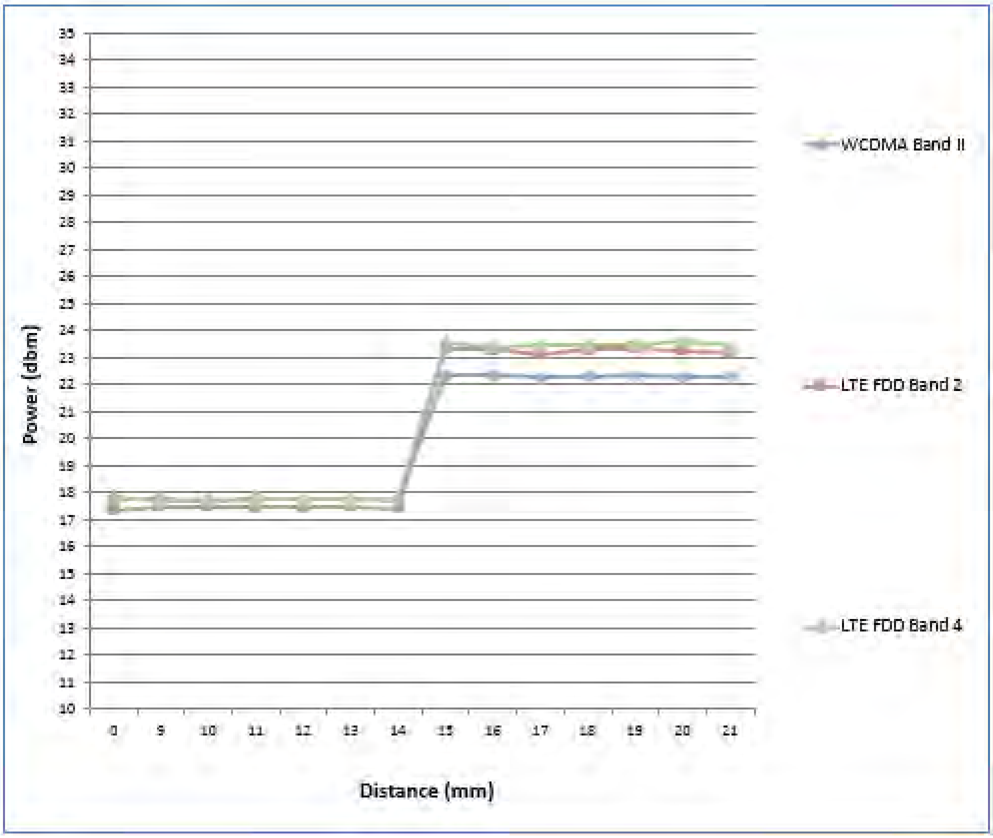

Table 1.6.5 Tilt angle test results for top side

P-sensor ON/OFF	-50 deg	-45 deg	-40 deg	-30 deg	-20 deg	-10 deg	0 deg	10 deg	20 deg	30 deg	40 deg	45 deg	50 deg
12mm	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
13mm	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF
14mm	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF

During the tilt angle testing for top side, the sensor is released during +/- 45deg until 12mm, so 12-1=11mm should be used in the SAR measurements.

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Note:

1. The triggering variations and hysteresis effect has been evaluated separately according to the tissue-equivalent medium required for each frequency band, and sensor triggering does not change with different tissue-equivalent media.
2. The default power level for sensor failure and malfunctioning, including all compliance concerns, has been addressed in the client's operation description (1.6.6) for the proximity sensor implementation to be acceptable.
3. Conducted power is monitored qualitatively to identify the general triggering characteristics and recorded quantitatively, versus spacing.

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1.6.6 Operation description for P-sensor

Power Reduction Design Specification (for P-sensor)

The mechanism of power reduction is used only for WWAN, not for Wi-Fi and Bluetooth. The reduced power for each technology/band is defined in Table1-1. With P-sensor mechanism, the WCDMA/LTE default power when P-sensor failure or malfunction are show in Table1-2 as below.

Table1-1：The power reduction scenario table

Band	Power Reduction
WCDMA B2	YES
WCDMA B5	NO
LTE B2/4	YES
LTE B5/12/13	NO
WLAN	NO
BT	NO

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Table1-2：The default maximum power when p-sensor failure or malfunction

Technology / Band	Mode	Default Maximum Power (dBm)
UMTS B2	All	18.5
UMTS B5	All	23.0
LTE B2	All	18
LTE B4	All	18.5
LTE B5	All	23.5
LTE B12	All	23.5
LTE B13	All	23.5

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1.7 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). The model EX3DV4 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ ($|Ei|^2$)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

The 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 intissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

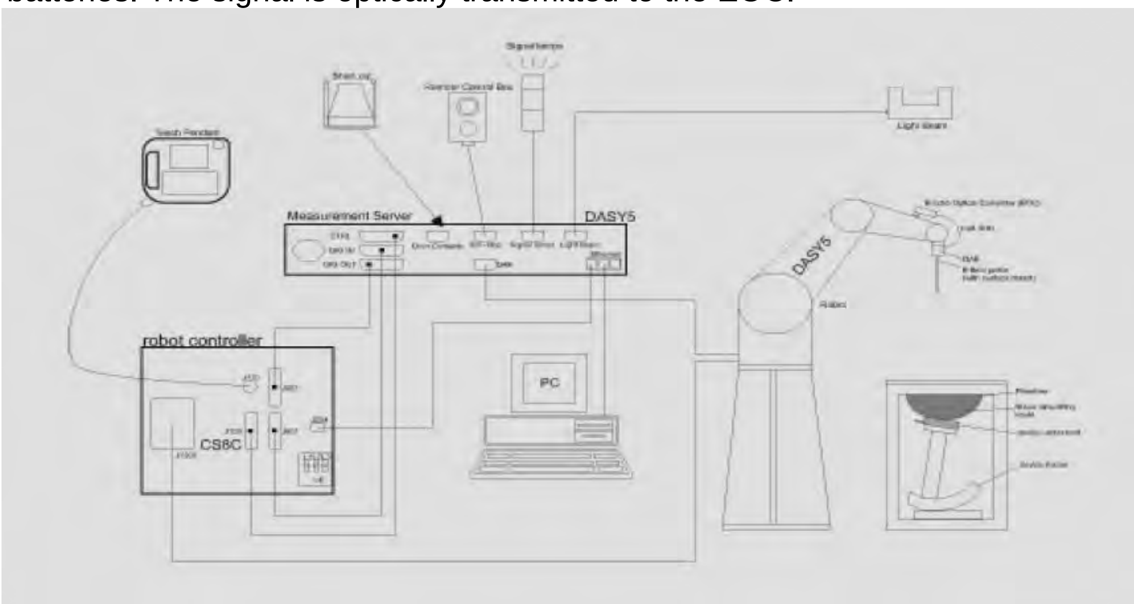

Fig. a The block diagram of SAR system

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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 Windows 7.
8. DASY 5 software.
9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
10. The device holder for handheld mobile phones.
11. 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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1.8 System Components

EX3DV4 E-Field Probe

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

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PHANTOM

Model	ELI	
Construction	The ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Shell Thickness	2 ± 0.2 mm	
Filling Volume	Approx. 30 liters	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	

DEVICE HOLDER

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

1.9 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% from the target SAR values. These tests were done at 750/835/1750/1900/2450/5200/ 5300/5600/5800MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1 (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was 21.7°C, the relative humidity was 62% and the liquid depth above the ear reference points was ≥ 15 cm ± 5 mm (frequency ≤ 3 GHz) or ≥ 10 cm ± 5 mm (frequency > 3 G Hz) 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.

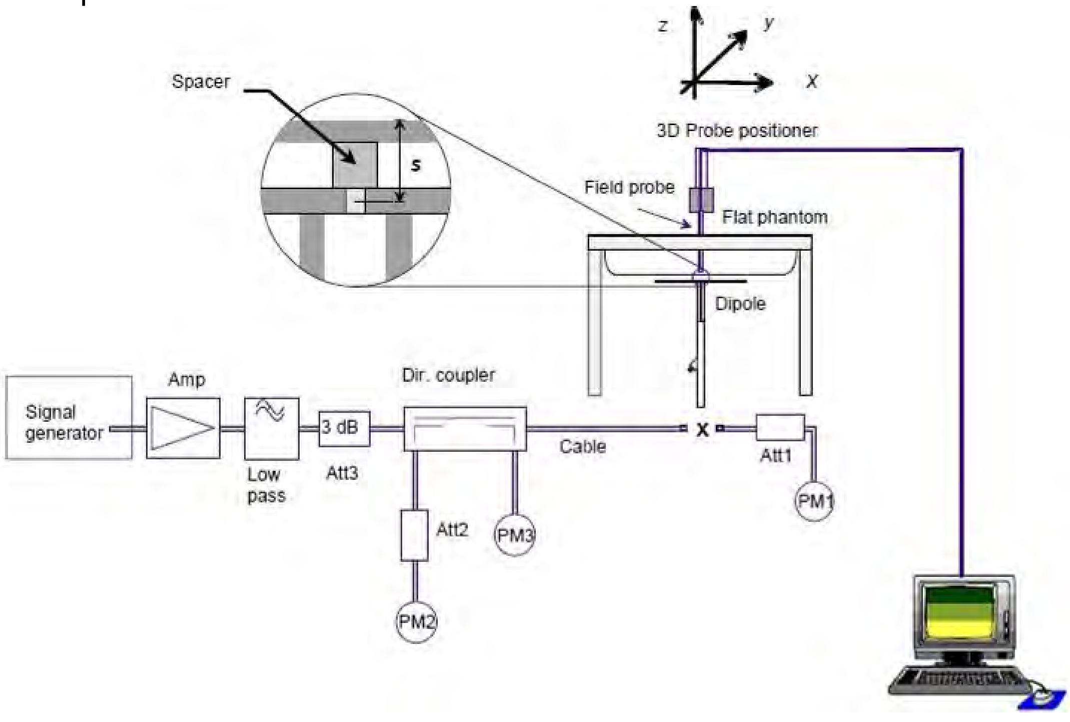

Fig. b The block diagram of system verification

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
D750V3	1078	750	Body	8.63	2.19	8.76	1.51%	Nov. 25, 2018
				8.63	2.17	8.68	0.58%	Dec. 09, 2018
D835V2	4d120	835	Body	9.68	2.48	9.92	2.48%	Nov. 26, 2018
				9.68	2.46	9.84	1.65%	Dec. 09, 2018
D1750V2	1023	1750	Body	36.8	9.03	36.12	-1.85%	Nov. 27, 2018
				36.8	9.01	36.04	-2.07%	Dec. 10, 2018
D1900V2	5d173	1900	Body	40.9	9.92	39.68	-2.98%	Nov. 28, 2018
				40.9	9.94	39.76	-2.79%	Dec. 10, 2018
D2450V2	727	2450	Body	50.8	12.6	50.40	-0.79%	Nov. 29, 2018
				50.8	12.5	50.00	-1.57%	Dec. 11, 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	Body	70.9	7.11	71.10	0.28%	Nov. 30, 2018
				70.9	7.09	70.90	0.00%	Dec. 11, 2018
		5300	Body	72.9	7.38	73.80	1.23%	Dec. 01, 2018
				72.9	7.41	74.10	1.65%	Dec. 11, 2018
		5600	Body	77.6	7.81	78.10	0.64%	Dec. 02, 2018
				77.6	7.85	78.50	1.16%	Dec. 11, 2018
		5800	Body	74.1	7.42	74.20	0.13%	Dec. 03, 2018
				74.1	7.39	73.90	-0.27%	Dec. 11, 2018

Table 1. Results of system verification

1.10 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 measured conductivity and permittivity are all within ± 5% of the target values.

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, 25. 2018	704	55.710	0.960	56.365	0.937	-1.18%	2.37%
		707.5	55.697	0.960	56.334	0.938	-1.14%	2.30%
		711	55.683	0.960	56.315	0.939	-1.13%	2.22%
		750	55.531	0.963	56.255	0.941	-1.30%	2.32%
		782	55.406	0.966	56.515	0.942	-2.00%	2.47%
	Nov, 26. 2018	826.4	55.234	0.969	55.167	1.006	0.12%	-3.78%
		829	55.223	0.970	55.144	1.008	0.14%	-3.97%
		835	55.200	0.970	55.123	1.009	0.14%	-4.02%
		836.5	55.195	0.972	55.022	1.011	0.31%	-4.03%
		836.6	55.195	0.972	55.001	1.013	0.35%	-4.22%
		844	55.172	0.981	54.995	1.014	0.32%	-3.36%
		846.6	55.164	0.984	54.895	1.019	0.49%	-3.53%
	Nov, 27. 2018	1720	53.511	1.469	53.076	1.422	0.81%	3.23%
		1732.5	53.478	1.477	53.086	1.423	0.73%	3.68%
		1745	53.445	1.485	53.094	1.434	0.66%	3.45%
		1750	53.432	1.488	52.765	1.452	1.25%	2.45%
	Nov, 28. 2018	1852.4	53.300	1.520	52.633	1.453	1.25%	4.41%
		1860	53.300	1.520	52.628	1.454	1.26%	4.34%
		1880	53.300	1.520	52.615	1.499	1.29%	1.38%
		1900	53.300	1.520	52.605	1.501	1.30%	1.25%
		1907.6	53.300	1.520	52.510	1.512	1.48%	0.53%
	Nov, 29. 2018	2402	52.764	1.904	52.885	1.939	-0.23%	-1.83%
		2412	52.751	1.914	52.874	1.941	-0.23%	-1.43%
		2437	52.717	1.938	52.863	1.943	-0.28%	-0.28%
		2441	52.712	1.941	52.855	1.944	-0.27%	-0.13%
		2450	52.700	1.950	52.668	2.019	0.06%	-3.54%
		2462	52.685	1.967	52.648	2.021	0.07%	-2.74%
		2480	52.662	1.993	52.631	2.022	0.06%	-1.48%

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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
Body	Nov, 30. 2018	5190	49.028	5.288	47.334	5.155	3.45%	2.51%
		5200	49.014	5.299	47.323	5.159	3.45%	2.65%
		5230	48.974	5.334	47.317	5.162	3.38%	3.23%
	Dec, 01. 2018	5260	48.933	5.369	47.303	5.164	3.33%	3.82%
		5280	48.906	5.393	47.298	5.223	3.29%	3.15%
		5300	48.879	5.416	47.153	5.372	3.53%	0.81%
	Dec, 02. 2018	5520	48.580	5.673	47.911	5.911	1.38%	-4.20%
		5580	48.499	5.743	47.905	5.932	1.22%	-3.29%
		5600	48.471	5.766	47.893	5.933	1.19%	-2.89%
		5680	48.363	5.860	47.883	5.934	0.99%	-1.27%
	Dec, 03. 2018	5745	48.275	5.936	47.077	5.911	2.48%	0.42%
		5785	48.220	5.982	47.068	5.928	2.39%	0.91%
		5800	48.200	6.000	47.055	5.933	2.38%	1.12%
		5825	48.166	6.029	47.034	5.954	2.35%	1.25%
		5785	48.220	5.982	47.023	5.969	2.48%	0.23%
		5800	48.200	6.000	47.011	5.971	2.47%	0.48%
		5825	48.166	6.029	46.997	5.976	2.43%	0.88%

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	Dec, 09. 2018	704	55.710	0.960	56.204	0.942	-0.89%	1.85%
		707.5	55.697	0.960	56.285	0.944	-1.06%	1.67%
		711	55.683	0.960	56.187	0.945	-0.90%	1.60%
		750	55.531	0.963	56.001	0.946	-0.85%	1.80%
		782	55.406	0.966	56.497	0.945	-1.97%	2.16%
		826.4	55.234	0.969	54.945	1.009	0.52%	-4.09%
		829	55.223	0.970	54.954	1.010	0.49%	-4.17%
		835	55.200	0.970	54.824	1.011	0.68%	-4.23%
		836.5	55.195	0.972	54.860	1.013	0.61%	-4.23%
		836.6	55.195	0.972	54.937	1.017	0.47%	-4.63%
		844	55.172	0.981	54.892	1.023	0.51%	-4.27%
		846.6	55.164	0.984	54.639	1.026	0.95%	-4.24%
	Dec, 10. 2018	1720	53.511	1.469	52.972	1.422	1.01%	3.23%
		1732.5	53.478	1.477	53.081	1.428	0.74%	3.34%
		1745	53.445	1.485	53.066	1.434	0.71%	3.45%
		1750	53.432	1.488	52.497	1.462	1.75%	1.78%
		1852.4	53.300	1.520	52.582	1.460	1.35%	3.95%
		1860	53.300	1.520	52.486	1.462	1.53%	3.82%
		1880	53.300	1.520	52.334	1.507	1.81%	0.86%
		1900	53.300	1.520	52.568	1.511	1.37%	0.59%
		1907.6	53.300	1.520	52.305	1.517	1.87%	0.20%

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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
Body	Dec, 11. 2018	2402	52.764	1.904	52.836	1.943	-0.14%	-2.04%
		2412	52.751	1.914	52.781	1.944	-0.06%	-1.58%
		2437	52.717	1.938	52.859	1.944	-0.27%	-0.33%
		2441	52.712	1.941	52.565	1.946	0.28%	-0.24%
		2450	52.700	1.950	52.540	2.026	0.30%	-3.90%
		2462	52.685	1.967	52.378	2.028	0.58%	-3.10%
		2480	52.662	1.993	52.377	2.027	0.54%	-1.73%
		5190	49.028	5.288	47.169	5.160	3.79%	2.41%
		5200	49.014	5.299	47.205	5.167	3.69%	2.50%
		5230	48.974	5.334	47.236	5.167	3.55%	3.14%
		5260	48.933	5.369	47.179	5.167	3.58%	3.77%
		5280	48.906	5.393	47.196	5.225	3.50%	3.11%
		5300	48.879	5.416	46.977	5.379	3.89%	0.68%
		5520	48.580	5.673	47.855	5.914	1.49%	-4.25%
		5580	48.499	5.743	47.870	5.933	1.30%	-3.31%
		5600	48.471	5.766	47.722	5.933	1.55%	-2.89%
		5680	48.363	5.860	47.871	5.943	1.02%	-1.42%
		5745	48.275	5.936	47.006	5.919	2.63%	0.28%
		5785	48.220	5.982	46.811	5.934	2.92%	0.81%
		5800	48.200	6.000	47.047	5.940	2.39%	1.00%
		5825	48.166	6.029	46.855	5.958	2.72%	1.18%
		5785	48.220	5.982	46.904	5.978	2.73%	0.07%
		5800	48.200	6.000	46.720	5.972	3.07%	0.47%
		5825	48.166	6.029	46.938	5.981	2.55%	0.80%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the body tissue simulating liquid:

Frequency (MHz)	Mode	Ingredient						Total amount
		DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	
750	Body	–	631.68 g	11.72 g	1.2 g	–	600 g	1.0L(Kg)
850	Body	–	631.68 g	11.72 g	1.2 g	–	600 g	1.0L(Kg)
1750	Body	300.67 g	716.56 g	4.0 g	–	–	–	1.0L(Kg)
1900	Body	300.67 g	716.56 g	4.0 g	–	–	–	1.0L(Kg)
2450	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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1.11 Evaluation Procedures

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

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

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

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

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans. The routines are verified and optimized for the grid dimensions used in

these cube measurements.
The measured volume of 30x30x30mm contains about 30g of tissue.
The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

1.12 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:

1.12.1 Transfer Calibration with Temperature Probes

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

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

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

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

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 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].

1.12.2 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.

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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.

1.13 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 an 10 grams of tissue (defined as a tissue volume in the shape of a cube).
2. Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.
3. Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape

of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section. (Table 4.)

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

WCDMA Band II (full power)

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	
WCDMA Band II	Back side	11	9262	1852.4	23.20	22.34	21.90%	0.502	0.612	-
	Back side	11	9400	1880	23.20	22.24	24.74%	0.598	0.746	-
	Back side	11	9538	1907.6	23.20	22.28	23.59%	0.610	0.754	-
	Back side**	11	9538	1907.6	23.20	22.28	23.59%	0.584	0.722	-
	Back side***	11	9538	1907.6	23.20	22.28	23.59%	0.566	0.700	-
	Top side	11	9262	1852.4	23.20	22.34	21.90%	0.092	0.112	-
	Bottom side	0	9262	1852.4	23.20	22.34	21.90%	0.173	0.211	-
	Right side	0	9262	1852.4	23.20	22.34	21.90%	0.022	0.027	-
	Left side	0	9262	1852.4	23.20	22.34	21.90%	0.319	0.389	-

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

WCDMA Band II (reduced power)

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	
WCDMA Band II	Back side	0	9262	1852.4	18.50	17.67	21.06%	0.933	1.129	-
	Back side	0	9400	1880	18.50	17.68	20.78%	0.945	1.141	-
	Back side	0	9538	1907.6	18.50	17.79	17.76%	0.977	1.151	113
	Back side*	0	9538	1907.6	18.50	17.79	17.76%	0.971	1.143	-
	Back side**	0	9538	1907.6	18.50	17.79	17.76%	0.951	1.120	-
	Back side***	0	9538	1907.6	18.50	17.79	17.76%	0.933	1.099	-
	Back side****	0	9538	1907.6	18.50	17.79	17.76%	0.042	0.049	-
	Back side*****	0	9538	1907.6	18.50	17.79	17.76%	0.041	0.048	-
	Back side******	0	9538	1907.6	18.50	17.79	17.76%	0.044	0.052	-
	Top side	0	9538	1907.6	18.50	17.79	17.76%	0.178	0.210	-

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

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

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WCDMA Band V (full power)

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	
WCDMA Band V	Back side	0	4132	826.4	23	21.87	29.72%	0.923	1.197	-
	Back side	0	4183	836.6	23	21.79	32.13%	0.911	1.204	-
	Back side	0	4233	846.6	23	21.8	31.83%	0.959	1.264	114
	Back side*	0	4233	846.6	23	21.8	31.83%	0.944	1.244	-
	Back side**	0	4233	846.6	23	21.8	31.83%	0.934	1.231	-
	Back side***	0	4233	846.6	23	21.8	31.83%	0.922	1.215	-
	Back side****	0	4233	846.6	23	21.8	31.83%	0.099	0.131	-
	Back side*****	0	4233	846.6	23	21.8	31.83%	0.091	0.120	-
	Back side******	0	4233	846.6	23	21.8	31.83%	0.097	0.128	-
	Top side	0	4233	846.6	23	21.8	31.83%	0.148	0.195	-
	Bottom side	0	4233	846.6	23	21.8	31.83%	0.048	0.063	-
	Right side	0	4233	846.6	23	21.8	31.83%	0.006	0.008	-
	Left side	0	4233	846.6	23	21.8	31.83%	0.307	0.405	-

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

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

LTE FDD Band 2 (full power)

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	
LTE Band 2	20MHz	QPSK	1 RB	0	Back side	11	18900	1880	24	23.06	24.17%	0.582	0.723	-
				50	Back side	11	18700	1860	24	23.05	24.45%	0.571	0.711	-
					Back side	11	19100	1900	24	23.31	17.22%	0.652	0.764	-
					Back side**	11	19100	1900	24	23.31	17.22%	0.553	0.648	-
					Back side***	11	19100	1900	24	23.31	17.22%	0.532	0.624	-
					Top side	11	19100	1900	24	23.31	17.22%	0.121	0.142	-
					Bottom side	0	19100	1900	24	23.31	17.22%	0.094	0.110	-
					Right side	0	19100	1900	24	23.31	17.22%	0.006	0.007	-
					Left side	0	19100	1900	24	23.31	17.22%	0.262	0.307	-
			50 RB	25	Back side	11	19100	1900	23	22.12	22.46%	0.481	0.589	-
					Top side	11	19100	1900	23	22.12	22.46%	0.095	0.116	-
					Bottom side	0	19100	1900	23	22.12	22.46%	0.079	0.097	-
					Right side	0	19100	1900	23	22.12	22.46%	0.005	0.006	-
					Left side	0	19100	1900	23	22.12	22.46%	0.224	0.274	-
			100 RB		Back side	11	19100	1900	23	22.18	20.78%	0.471	0.569	-
					Top side	11	19100	1900	23	22.18	20.78%	0.088	0.106	-
					Bottom side	0	19100	1900	23	22.18	20.78%	0.075	0.091	-
					Right side	0	19100	1900	23	22.18	20.78%	0.005	0.006	-
					Left side	0	19100	1900	23	22.18	20.78%	0.213	0.257	-

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

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LTE FDD Band 2 (reduced power)

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	
LTE Band 2	20MHz	QPSK	1 RB	0	Back side	0	18700	1860	18	17.42	14.29%	0.951	1.087	-
				50	Back side	0	19100	1900	18	17.37	15.61%	0.956	1.105	-
				99	Back side	0	18900	1880	18	17.49	12.46%	0.987	1.110	115
					Back side*	0	18900	1880	18	17.49	12.46%	0.985	1.108	-
					Back side**	0	18900	1880	18	17.49	12.46%	0.974	1.095	-
					Back side***	0	18900	1880	18	17.49	12.46%	0.966	1.086	-
					Back side****	0	18900	1880	18	17.49	12.46%	0.036	0.040	-
					Back side*****	0	18900	1880	18	17.49	12.46%	0.031	0.035	-
					Back side******	0	18900	1880	18	17.49	12.46%	0.028	0.031	-
					Top side	0	18900	1880	18	17.49	12.46%	0.182	0.205	-
			50 RB	0	Back side	0	18700	1860	18	17.48	12.72%	0.963	1.085	-
					Back side	0	18900	1880	18	17.42	14.29%	0.965	1.103	-
				25	Back side	0	19100	1900	18	17.48	12.72%	0.971	1.095	-
					Top side	0	19100	1900	18	17.48	12.72%	0.178	0.201	-
			100 RB		Back side	0	18700	1860	18	17.39	15.08%	0.918	1.056	-
					Back side	0	18900	1880	18	17.47	12.98%	0.923	1.043	-
					Back side	0	19100	1900	18	17.44	13.76%	0.921	1.048	-
					Top side	0	18900	1880	18	17.47	12.98%	0.174	0.197	-

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

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

LTE FDD Band 4 (full power)

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	
LTE Band 4	20MHz	QPSK	1 RB	0	Back side	11	20050	1720	24.5	23.41	28.53%	0.669	0.860	-
					Back side	11	20300	1745	24.5	23.37	29.72%	0.682	0.885	-
					Back side**	11	20300	1745	24.5	23.37	29.72%	0.661	0.857	-
					Back side***	11	20300	1745	24.5	23.37	29.72%	0.643	0.834	-
				50	Back side	11	20175	1732.5	24.5	23.55	24.45%	0.660	0.821	-
					Top side	11	20175	1732.5	24.5	23.55	24.45%	0.119	0.148	-
					Bottom side	0	20175	1732.5	24.5	23.55	24.45%	0.101	0.126	-
					Right side	0	20175	1732.5	24.5	23.55	24.45%	0.007	0.009	-
					Left side	0	20175	1732.5	24.5	23.55	24.45%	0.288	0.358	-
			50 RB	0	Back side	11	20300	1745	23.5	22.25	33.35%	0.501	0.668	-
					Top side	11	20300	1745	23.5	22.25	33.35%	0.088	0.117	-
					Bottom side	0	20300	1745	23.5	22.25	33.35%	0.077	0.103	-
					Right side	0	20300	1745	23.5	22.25	33.35%	0.004	0.006	-
					Left side	0	20300	1745	23.5	22.25	33.35%	0.212	0.283	-
			100 RB		Back side	11	20175	1732.5	23.5	22.14	36.77%	0.492	0.673	-
					Top side	11	20175	1732.5	23.5	22.14	36.77%	0.087	0.119	-
					Bottom side	0	20175	1732.5	23.5	22.14	36.77%	0.071	0.097	-
					Right side	0	20175	1732.5	23.5	22.14	36.77%	0.004	0.005	-
					Left side	0	20175	1732.5	23.5	22.14	36.77%	0.209	0.286	-

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

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LTE FDD Band 4 (reduced power)

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	
LTE Band 4	20MHz	QPSK	1 RB	0	Back side	0	20050	1720	18.5	17.78	18.03%	1.010	1.192	116
					Back side*	0	20050	1720	18.5	17.78	18.03%	0.994	1.173	-
					Back side**	0	20050	1720	18.5	17.78	18.03%	0.984	1.161	-
					Back side***	0	20050	1720	18.5	17.78	18.03%	0.953	1.125	-
					Back side****	0	20050	1720	18.5	17.78	18.03%	0.037	0.044	-
					Back side*****	0	20050	1720	18.5	17.78	18.03%	0.034	0.040	-
					Back side******	0	20050	1720	18.5	17.78	18.03%	0.035	0.041	-
					Back side	0	20175	1732.5	18.5	17.51	25.60%	0.941	1.182	-
					Top side	0	20050	1720	18.5	17.78	18.03%	0.587	0.693	-
			50 RB	0	Back side	0	20050	1720	18.5	17.45	27.35%	0.912	1.161	-
					Back side	0	20300	1745	18.5	17.49	26.18%	0.918	1.158	-
				25	Back side	0	20175	1732.5	18.5	17.54	24.74%	0.924	1.153	-
					Top side	0	20175	1732.5	18.5	17.54	24.74%	0.546	0.681	-
			100 RB		Back side	0	20050	1720	18.5	17.48	26.47%	0.933	1.180	-
					Back side	0	20175	1732.5	18.5	17.59	23.31%	0.942	1.162	-
					Back side	0	20300	1745	18.5	17.44	27.64%	0.921	1.176	-
					Top side	0	20175	1732.5	18.5	17.59	23.31%	0.538	0.663	-

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

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

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LTE FDD Band 5 (full power)

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	
LTE Band 5	10MHz	QPSK	1 RB	25	Back side	0	20450	829	23.5	23.40	2.33%	1.010	1.034	-
					Back side	0	20525	836.5	23.5	23.49	0.23%	1.130	1.133	117
					Back side*	0	20525	836.5	23.5	23.49	0.23%	1.050	1.052	-
					Back side**	0	20525	836.5	23.5	23.49	0.23%	0.995	0.997	-
					Back side***	0	20525	836.5	23.5	23.49	0.23%	0.981	0.983	-
					Back side****	0	20525	836.5	23.5	23.49	0.23%	0.095	0.095	-
					Back side*****	0	20525	836.5	23.5	23.49	0.23%	0.091	0.091	-
					Back side******	0	20525	836.5	23.5	23.49	0.23%	0.088	0.088	-
					Back side	0	20600	844	23.5	23.29	4.95%	1.020	1.071	-
					Top side	0	20525	836.5	23.5	23.49	0.23%	0.174	0.174	-
					Bottom side	0	20525	836.5	23.5	23.49	0.23%	0.057	0.057	-
					Right side	0	20525	836.5	23.5	23.49	0.23%	0.007	0.007	-
					Left side	0	20525	836.5	23.5	23.49	0.23%	0.361	0.362	-
			25 RB	12	Back side	0	20450	829	22.5	22.33	3.99%	0.833	0.866	-
					Back side	0	20600	844	22.5	22.33	3.99%	0.832	0.865	-
				25	Back side	0	20525	836.5	22.5	22.36	3.28%	0.848	0.876	-
					Top side	0	20525	836.5	22.5	22.36	3.28%	0.131	0.135	-
					Bottom side	0	20525	836.5	22.5	22.36	3.28%	0.043	0.044	-
					Right side	0	20525	836.5	22.5	22.36	3.28%	0.006	0.006	-
					Left side	0	20525	836.5	22.5	22.36	3.28%	0.272	0.281	-
			50 RB		Back side	0	20525	836.5	22.5	22.37	3.04%	0.825	0.850	-
					Top side	0	20525	836.5	22.5	22.37	3.04%	0.127	0.131	-
					Bottom side	0	20525	836.5	22.5	22.37	3.04%	0.041	0.042	-
					Right side	0	20525	836.5	22.5	22.37	3.04%	0.005	0.006	-
					Left side	0	20525	836.5	22.5	22.37	3.04%	0.264	0.272	-

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

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

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LTE FDD Band 12 (full power)

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	
LTE Band 12	10MHz	QPSK	1 RB	25	Back side	0	23060	704	23.5	23.46	0.93%	1.020	1.029	-
					Back side	0	23095	707.5	23.5	23.40	2.33%	1.160	1.187	-
					Back side	0	23130	711	23.5	23.47	0.69%	1.260	1.269	118
					Back side*	0	23130	711	23.5	23.47	0.69%	1.210	1.218	-
					Back side**	0	23130	711	23.5	23.47	0.69%	1.130	1.138	-
					Back side***	0	23130	711	23.5	23.47	0.69%	1.060	1.067	-
					Back side****	0	23130	711	23.5	23.47	0.69%	0.119	0.120	-
					Back side*****	0	23130	711	23.5	23.47	0.69%	0.112	0.113	-
					Back side******	0	23130	711	23.5	23.47	0.69%	0.117	0.118	-
					Top side	0	23130	711	23.5	23.47	0.69%	0.191	0.192	-
					Bottom side	0	23130	711	23.5	23.47	0.69%	0.062	0.062	-
					Right side	0	23130	711	23.5	23.47	0.69%	0.008	0.008	-
					Left side	0	23130	711	23.5	23.47	0.69%	0.401	0.404	-
			25 RB	12	Back side	0	23095	707.5	22.5	22.26	5.68%	0.911	0.963	-
					Back side	0	23130	711	22.5	22.41	2.09%	0.932	0.952	-
					Top side	0	23130	711	22.5	22.41	2.09%	0.142	0.145	-
					Bottom side	0	23130	711	22.5	22.41	2.09%	0.045	0.046	-
					Right side	0	23130	711	22.5	22.41	2.09%	0.006	0.006	-
					Left side	0	23130	711	22.5	22.41	2.09%	0.298	0.304	-
				25	Back side	0	23060	704	22.5	22.32	4.23%	0.903	0.941	-
			50 RB		Back side	0	23060	704	22.5	22.31	4.47%	0.861	0.900	-
					Back side	0	23095	707.5	22.5	22.28	5.20%	0.882	0.928	-
					Back side	0	23130	711	22.5	22.39	2.57%	0.894	0.917	-
					Top side	0	23130	711	22.5	22.39	2.57%	0.137	0.141	-
					Bottom side	0	23130	711	22.5	22.39	2.57%	0.043	0.044	-
					Right side	0	23130	711	22.5	22.39	2.57%	0.005	0.005	
					Left side	0	23130	711	22.5	22.39	2.57%	0.287	0.294	-

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

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

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LTE FDD Band 13 (full power)

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) Measured	Averaged SAR over 1g (W/kg) Reported	Plot page
LTE Band 13	10MHz	QPSK	1 RB	0	Back side	0	23230	782	23.5	23.42	1.86%	1.180	1.202	119
					Back side*	0	23230	782	23.5	23.42	1.86%	1.110	1.131	-
					Back side**	0	23230	782	23.5	23.42	1.86%	1.040	1.059	-
					Back side***	0	23230	782	23.5	23.42	1.86%	0.995	1.013	-
					Back side****	0	23230	782	23.5	23.42	1.86%	0.126	0.128	-
					Back side*****	0	23230	782	23.5	23.42	1.86%	0.118	0.120	-
					Back side******	0	23230	782	23.5	23.42	1.86%	0.114	0.116	-
					Top side	0	23230	782	23.5	23.42	1.86%	0.183	0.186	-
					Bottom side	0	23230	782	23.5	23.42	1.86%	0.061	0.062	-
					Right side	0	23230	782	23.5	23.42	1.86%	0.008	0.008	-
					Left side	0	23230	782	23.5	23.42	1.86%	0.382	0.389	-
				25	Back side	0	23230	782	23.5	23.06	10.66%	1.080	1.195	-
				49	Back side	0	23230	782	23.5	22.85	16.14%	1.010	1.173	-
			25 RB	0	Back side	0	23230	782	22.5	22.10	9.65%	0.862	0.945	-
					Top side	0	23230	782	22.5	22.10	9.65%	0.136	0.149	-
					Bottom side	0	23230	782	22.5	22.10	9.65%	0.047	0.052	-
					Right side	0	23230	782	22.5	22.10	9.65%	0.006	0.007	-
					Left side	0	23230	782	22.5	22.10	9.65%	0.281	0.308	-
				12	Back side	0	23230	782	22.5	22.08	10.15%	0.855	0.942	-
				25	Back side	0	23230	782	22.5	21.96	13.24%	0.841	0.952	-
			50 RB		Back side	0	23230	782	22.5	21.99	12.46%	0.851	0.957	-
					Top side	0	23230	782	22.5	21.99	12.46%	0.133	0.150	-
					Bottom side	0	23230	782	22.5	21.99	12.46%	0.043	0.048	-
					Right side	0	23230	782	22.5	21.99	12.46%	0.006	0.007	
					Left side	0	23230	782	22.5	21.99	12.46%	0.277	0.312	-

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

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WLAN/BT

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	
WLAN 802.11b	Back side	0	11	2462	19.5	17.96	142.56%	0.215	0.307	-
	Top side	0	11	2462	19.5	17.96	142.56%	0.001	0.002	-
	Bottom side	0	11	2462	19.5	17.96	142.56%	0.285	0.406	120
	Bottom side**	0	11	2462	19.5	17.96	142.56%	0.271	0.386	-
	Bottom side***	0	11	2462	19.5	17.96	142.56%	0.233	0.332	-
	Bottom side****	0	11	2462	19.5	17.96	142.56%	0.211	0.301	-
	Bottom side*****	0	11	2462	19.5	17.96	142.56%	0.245	0.349	-
	Bottom side******	0	11	2462	19.5	17.96	142.56%	0.246	0.351	-
	Right side	0	11	2462	19.5	17.96	142.56%	0.009	0.012	-
	Left side	0	11	2462	19.5	17.96	142.56%	0.045	0.064	-
Bluetooth (GFSK)	Back side	0	0	2402	11.6	9.66	156.31%	0.036	0.056	-
	Top side	0	0	2402	11.6	9.66	156.31%	0.000	0.000	-
	Bottom side	0	0	2402	11.6	9.66	156.31%	0.038	0.059	121
	Bottom side**	0	0	2402	11.6	9.66	156.31%	0.024	0.038	-
	Bottom side***	0	0	2402	11.6	9.66	156.31%	0.021	0.033	-
	Bottom side****	0	0	2402	11.6	9.66	156.31%	0.033	0.052	-
	Bottom side*****	0	0	2402	11.6	9.66	156.31%	0.031	0.048	-
	Bottom side******	0	0	2402	11.6	9.66	156.31%	0.029	0.045	-
	Right side	0	0	2402	11.6	9.66	156.31%	0.001	0.002	-
	Left side	0	0	2402	11.6	9.66	156.31%	0.006	0.010	-
WLAN 802.11n(40M) 5.2G	Back side	0	46	5230	14.5	12.83	146.89%	0.156	0.229	-
	Top side	0	46	5230	14.5	12.83	146.89%	0.000	0.001	-
	Bottom side	0	46	5230	14.5	12.83	146.89%	0.095	0.140	-
	Right side	0	46	5230	14.5	12.83	146.89%	0.000	0.001	-
	Left side	0	46	5230	14.5	12.83	146.89%	0.186	0.273	122
	Left side**	0	46	5230	14.5	12.83	146.89%	0.163	0.239	-
	Left side***	0	46	5230	14.5	12.83	146.89%	0.164	0.241	-
	Left side****	0	46	5230	14.5	12.83	146.89%	0.171	0.251	-
	Left side*****	0	46	5230	14.5	12.83	146.89%	0.162	0.238	-
	Left side******	0	46	5230	14.5	12.83	146.89%	0.166	0.244	-

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

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	
WLAN 802.11a 5.3G	Back side	0	60	5300	17.5	15.75	149.62%	0.465	0.696	-
	Top side	0	60	5300	17.5	15.75	149.62%	0.001	0.002	-
	Bottom side	0	60	5300	17.5	15.75	149.62%	0.327	0.489	-
	Right side	0	60	5300	17.5	15.75	149.62%	0.002	0.002	-
	Left side	0	52	5260	17.5	15.67	152.41%	0.539	0.821	-
	Left side	0	60	5300	17.5	15.75	149.62%	0.639	0.956	123
	Left side**	0	60	5300	17.5	15.75	149.62%	0.615	0.920	-
	Left side***	0	60	5300	17.5	15.75	149.62%	0.594	0.889	-
	Left side****	0	60	5300	17.5	15.75	149.62%	0.601	0.899	-
	Left side*****	0	60	5300	17.5	15.75	149.62%	0.598	0.895	-
	Left side******	0	60	5300	17.5	15.75	149.62%	0.606	0.907	-
WLAN 802.11a 5.6G	Back side	0	116	5580	17.5	15.81	147.57%	0.413	0.609	-
	Top side	0	116	5580	17.5	15.81	147.57%	0.001	0.002	-
	Bottom side	0	116	5580	17.5	15.81	147.57%	0.286	0.422	-
	Right side	0	116	5580	17.5	15.81	147.57%	0.001	0.002	-
	Left side	0	116	5580	17.5	15.81	147.57%	0.559	0.825	-
	Left side	0	136	5680	17.5	15.79	148.25%	0.648	0.961	124
	Left side**	0	136	5680	17.5	15.79	148.25%	0.622	0.922	-
	Left side***	0	136	5680	17.5	15.79	148.25%	0.606	0.898	-
	Left side****	0	136	5680	17.5	15.79	148.25%	0.423	0.627	-
	Left side*****	0	136	5680	17.5	15.79	148.25%	0.484	0.718	-
	Left side******	0	136	5680	17.5	15.79	148.25%	0.543	0.805	-
WLAN 802.11a 5.8G	Back side	0	149	5745	17.5	15.76	149.28%	0.618	0.923	-
	Back side	0	157	5785	17.5	15.56	156.31%	0.664	1.038	-
	Back side	0	165	5825	17.5	15.77	148.94%	0.750	1.117	125
	Back side**	0	165	5825	17.5	15.77	148.94%	0.703	1.047	-
	Back side***	0	165	5825	17.5	15.77	148.94%	0.651	0.970	-
	Back side****	0	165	5825	17.5	15.77	148.94%	0.014	0.021	-
	Back side*****	0	165	5825	17.5	15.77	148.94%	0.017	0.025	-
	Back side******	0	165	5825	17.5	15.77	148.94%	0.017	0.025	-
	Top side	0	165	5825	17.5	15.77	148.94%	0.002	0.002	-
	Bottom side	0	165	5825	17.5	15.77	148.94%	0.384	0.572	-
	Right side	0	165	5825	17.5	15.77	148.94%	0.002	0.003	-
	Left side	0	149	5745	17.5	15.76	149.28%	0.667	0.996	-
	Left side	0	165	5825	17.5	15.77	148.94%	0.558	0.831	-

** - Landscape scanner spotcheck

*** - Portrait scanner spotcheck

**** - Hand Strap 11U

***** - Hand Strap 12U

****** - Hand Strap 13U

3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

NO.	Simultaneous Transmit Configurations	Body
1	UMTS + 2.4GHz	YES
2	UMTS + 5GHz	YES
3	UMTS + BT	YES
5	LTE + 2.4GHz	YES
6	LTE + 5GHz	YES
7	LTE + BT	YES

Note :
1) WWAN and WLAN may transmit simultaneously.
2) Bluetooth and WLAN share the same antenna path.
3) Bluetooth can't transmit with WLAN simultaneously.

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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:

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

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.

Back side WWAN + 2.4GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
1	Back side	WCDMA Band II	0	1.151	0.307	1.458	ΣSAR<1.6, Not required
		WCDMA Band V	0	1.264	0.307	1.571	ΣSAR<1.6, Not required
		LTE Band 2	0	1.110	0.307	1.417	ΣSAR<1.6, Not required
		LTE Band 4	0	1.192	0.307	1.499	ΣSAR<1.6, Not required
		LTE Band 5	0	1.133	0.307	1.440	ΣSAR<1.6, Not required
		LTE Band 12	0	1.269	0.307	1.576	ΣSAR<1.6, Not required
		LTE Band 13	0	1.202	0.307	1.509	ΣSAR<1.6, Not required

Top side WWAN + 2.4GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
2	Top side	WCDMA Band II	0	0.210	0.002	0.212	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.195	0.002	0.197	ΣSAR<1.6, Not required
		LTE Band 2	0	0.205	0.002	0.207	ΣSAR<1.6, Not required
		LTE Band 4	0	0.693	0.002	0.695	ΣSAR<1.6, Not required
		LTE Band 5	0	0.174	0.002	0.176	ΣSAR<1.6, Not required
		LTE Band 12	0	0.192	0.002	0.194	ΣSAR<1.6, Not required
		LTE Band 13	0	0.186	0.002	0.188	ΣSAR<1.6, Not required

Bottom side WWAN + 2.4GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
3	Bottom side	WCDMA Band II	0	0.211	0.406	0.617	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.063	0.406	0.469	ΣSAR<1.6, Not required
		LTE Band 2	0	0.110	0.406	0.516	ΣSAR<1.6, Not required
		LTE Band 4	0	0.126	0.406	0.532	ΣSAR<1.6, Not required
		LTE Band 5	0	0.057	0.406	0.463	ΣSAR<1.6, Not required
		LTE Band 12	0	0.062	0.406	0.468	ΣSAR<1.6, Not required
		LTE Band 13	0	0.062	0.406	0.468	ΣSAR<1.6, Not required

Right side WWAN + 2.4GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
4	Right side	WCDMA Band II	0	0.027	0.012	0.039	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.008	0.012	0.020	ΣSAR<1.6, Not required
		LTE Band 2	0	0.007	0.012	0.019	ΣSAR<1.6, Not required
		LTE Band 4	0	0.009	0.012	0.021	ΣSAR<1.6, Not required
		LTE Band 5	0	0.007	0.012	0.019	ΣSAR<1.6, Not required
		LTE Band 12	0	0.008	0.012	0.020	ΣSAR<1.6, Not required
		LTE Band 13	0	0.008	0.012	0.020	ΣSAR<1.6, Not required

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Left side WWAN + 2.4GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
5	Left side	WCDMA Band II	0	0.389	0.064	0.453	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.405	0.064	0.469	ΣSAR<1.6, Not required
		LTE Band 2	0	0.307	0.064	0.371	ΣSAR<1.6, Not required
		LTE Band 4	0	0.358	0.064	0.422	ΣSAR<1.6, Not required
		LTE Band 5	0	0.362	0.064	0.426	ΣSAR<1.6, Not required
		LTE Band 12	0	0.404	0.064	0.468	ΣSAR<1.6, Not required
		LTE Band 13	0	0.389	0.064	0.453	ΣSAR<1.6, Not required

Back side WWAN + 5GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
6	Back side	WCDMA Band II	0	1.151	1.117	**2.268**	Analyzed as below
		WCDMA Band V	0	1.264	1.117	**2.381**	Analyzed as below
		LTE Band 2	0	1.110	1.117	**2.227**	Analyzed as below
		LTE Band 4	0	1.192	1.117	**2.309**	Analyzed as below
		LTE Band 5	0	1.133	1.117	**2.250**	Analyzed as below
		LTE Band 12	0	1.269	1.117	**2.386**	Analyzed as below
		LTE Band 13	0	1.202	1.117	**2.319**	Analyzed as below

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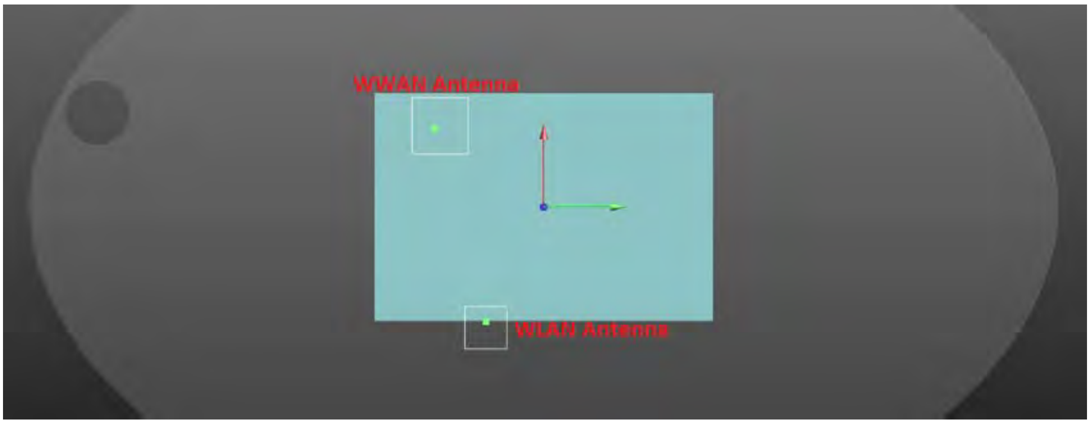
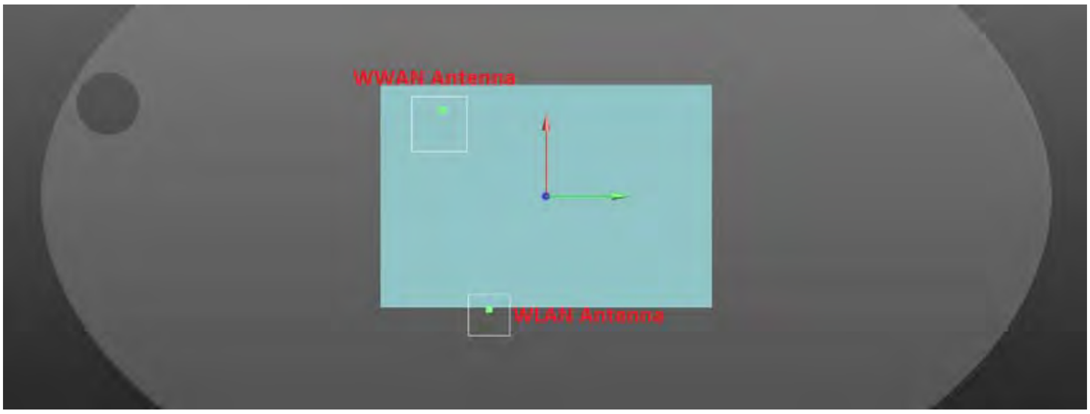
Back side WCDMA Band II + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.268	114.49	0.030	SPLSR<0.04, Not required
WCDMA Band II		1.151	4.49	-6.22	-0.384				



Back side WCDMA Band V + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.381	119	0.031	SPLSR<0.04, Not required
WCDMA Band V		1.264	5.00	-6.04	-0.44				



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Back side LTE Band 2 + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.227	115.27	0.029	SPLSR<0.04, Not required
LTE Band 2		1.110	4.65	5.90	-0.385				

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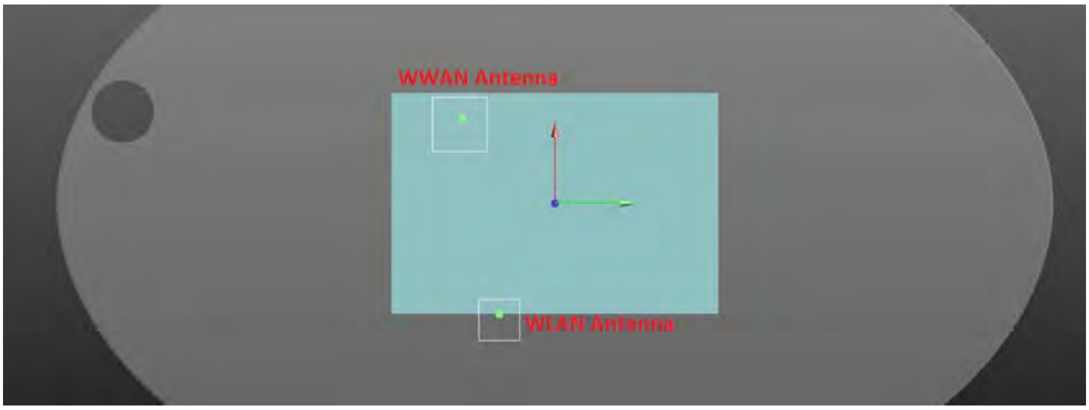
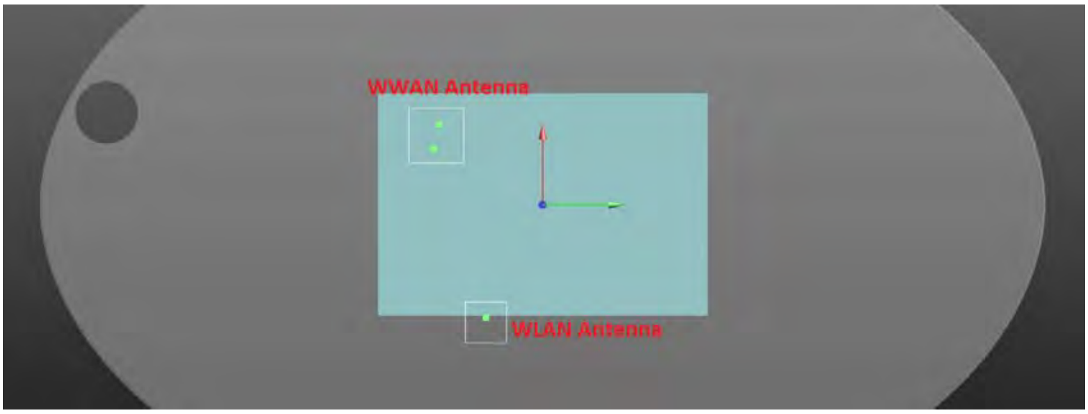
Back side LTE Band 4 + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.309	117.47	0.030	SPLSR<0.04, Not required
LTE Band 4		1.192	4.97	-5.44	-0.29				



Back side LTE Band 5 + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.25	115.98	0.029	SPLSR<0.04, Not required
LTE Band 5		1.133	4.69	-6.04	-0.416				



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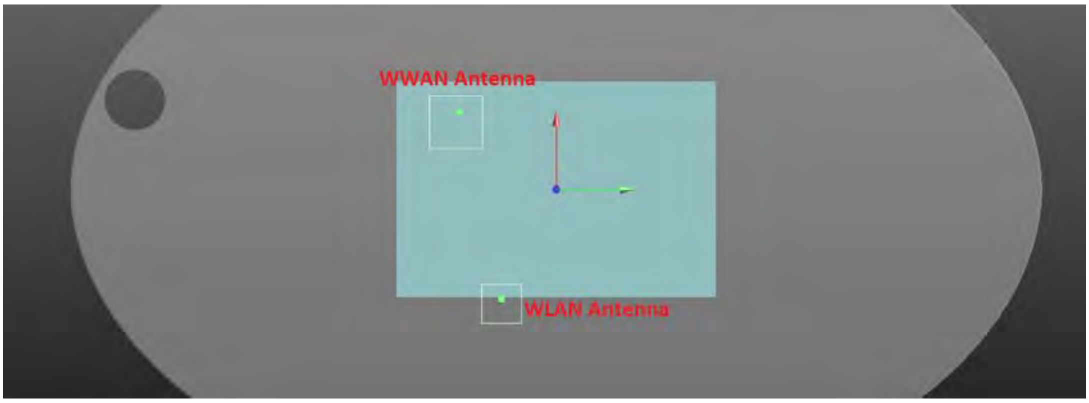
Back side LTE Band 12 + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.386	115.64	0.032	SPLSR<0.04, Not required
LTE Band 12		1.269	4.69	-5.89	-0.417				



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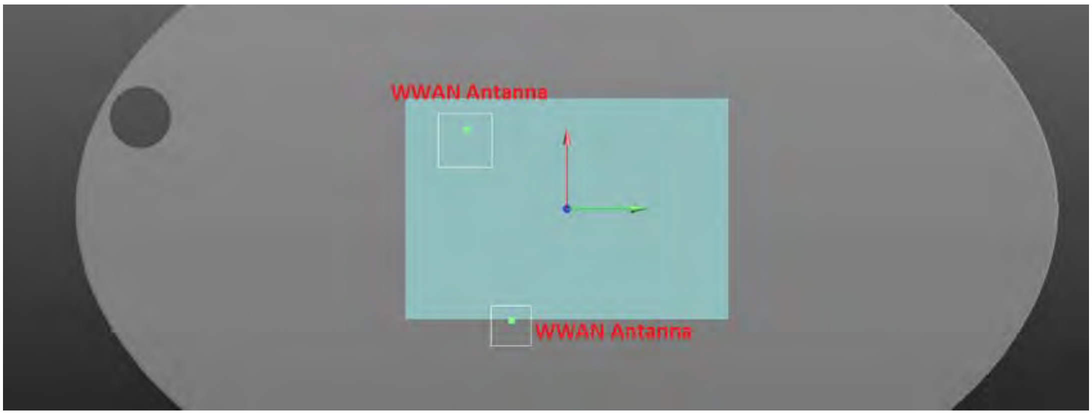
Back side LTE Band 13 + 5GHz WLAN

Conditions	Position	SAR Value (W/kg)	Coordinates (cm)			ΣSAR (W/kg)	Peak Location Separation Distance (mm)	SPLSR	Simultaneous Transmission SAR Test
			x	y	z				
WLAN	Back side	1.117	-6.58	-3.30	-0.351	2.319	115.64	0.031	SPLSR<0.04, Not required
LTE Band 13		1.202	4.69	-5.89	-0.418				



Top side WWAN + 5GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
7	Top side	WCDMA Band II	0	0.210	0.002	0.212	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.195	0.002	0.197	ΣSAR<1.6, Not required
		LTE Band 2	0	0.205	0.002	0.207	ΣSAR<1.6, Not required
		LTE Band 4	0	0.693	0.002	0.695	ΣSAR<1.6, Not required
		LTE Band 5	0	0.174	0.002	0.176	ΣSAR<1.6, Not required
		LTE Band 12	0	0.192	0.002	0.194	ΣSAR<1.6, Not required
		LTE Band 13	0	0.186	0.002	0.188	ΣSAR<1.6, Not required

Bottom side WWAN + 5GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
8	Bottom side	WCDMA Band II	0	0.211	0.572	0.783	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.063	0.572	0.635	ΣSAR<1.6, Not required
		LTE Band 2	0	0.110	0.572	0.682	ΣSAR<1.6, Not required
		LTE Band 4	0	0.126	0.572	0.698	ΣSAR<1.6, Not required
		LTE Band 5	0	0.057	0.572	0.629	ΣSAR<1.6, Not required
		LTE Band 12	0	0.062	0.572	0.634	ΣSAR<1.6, Not required
		LTE Band 13	0	0.062	0.572	0.634	ΣSAR<1.6, Not required

Right side WWAN + 5GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
9	Right side	WCDMA Band II	0	0.027	0.003	0.030	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.008	0.003	0.011	ΣSAR<1.6, Not required
		LTE Band 2	0	0.007	0.003	0.010	ΣSAR<1.6, Not required
		LTE Band 4	0	0.009	0.003	0.012	ΣSAR<1.6, Not required
		LTE Band 5	0	0.007	0.003	0.010	ΣSAR<1.6, Not required
		LTE Band 12	0	0.008	0.003	0.011	ΣSAR<1.6, Not required
		LTE Band 13	0	0.008	0.003	0.011	ΣSAR<1.6, Not required

Left side WWAN + 5GHz WLAN

No.	Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN	SAR Sum	SPLSR
10	Left side	WCDMA Band II	0	0.389	0.996	1.385	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.405	0.996	1.401	ΣSAR<1.6, Not required
		LTE Band 2	0	0.307	0.996	1.303	ΣSAR<1.6, Not required
		LTE Band 4	0	0.358	0.996	1.354	ΣSAR<1.6, Not required
		LTE Band 5	0	0.362	0.996	1.358	ΣSAR<1.6, Not required
		LTE Band 12	0	0.404	0.996	1.400	ΣSAR<1.6, Not required
		LTE Band 13	0	0.389	0.996	1.385	ΣSAR<1.6, Not required

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Back side WWAN + Bluetooth

No.	Position	Conditions	Distance (mm)	Max. WWAN	BT	SAR Sum	SPLSR
11	Back side	WCDMA Band II	0	1.151	0.056	1.207	ΣSAR<1.6, Not required
		WCDMA Band V	0	1.264	0.056	1.320	ΣSAR<1.6, Not required
		LTE Band 2	0	1.110	0.056	1.166	ΣSAR<1.6, Not required
		LTE Band 4	0	1.192	0.056	1.248	ΣSAR<1.6, Not required
		LTE Band 5	0	1.133	0.056	1.189	ΣSAR<1.6, Not required
		LTE Band 12	0	1.269	0.056	1.325	ΣSAR<1.6, Not required
		LTE Band 13	0	1.202	0.056	1.258	ΣSAR<1.6, Not required

Top side WWAN + Bluetooth

No.	Position	Conditions	Distance (mm)	Max. WWAN	BT	SAR Sum	SPLSR
12	Top side	WCDMA Band II	0	0.210	0.000	0.210	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.195	0.000	0.195	ΣSAR<1.6, Not required
		LTE Band 2	0	0.205	0.000	0.205	ΣSAR<1.6, Not required
		LTE Band 4	0	0.693	0.000	0.693	ΣSAR<1.6, Not required
		LTE Band 5	0	0.174	0.000	0.174	ΣSAR<1.6, Not required
		LTE Band 12	0	0.192	0.000	0.192	ΣSAR<1.6, Not required
		LTE Band 13	0	0.186	0.000	0.186	ΣSAR<1.6, Not required

Bottom side WWAN + Bluetooth

No.	Position	Conditions	Distance (mm)	Max. WWAN	BT	SAR Sum	SPLSR
13	Bottom side	WCDMA Band II	0	0.211	0.059	0.270	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.063	0.059	0.122	ΣSAR<1.6, Not required
		LTE Band 2	0	0.110	0.059	0.169	ΣSAR<1.6, Not required
		LTE Band 4	0	0.126	0.059	0.185	ΣSAR<1.6, Not required
		LTE Band 5	0	0.057	0.059	0.116	ΣSAR<1.6, Not required
		LTE Band 12	0	0.062	0.059	0.121	ΣSAR<1.6, Not required
		LTE Band 13	0	0.062	0.059	0.121	ΣSAR<1.6, Not required

Right side WWAN + Bluetooth

No.	Position	Conditions	Distance (mm)	Max. WWAN	BT	SAR Sum	SPLSR
14	Right side	WCDMA Band II	0	0.027	0.002	0.029	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.008	0.002	0.010	ΣSAR<1.6, Not required
		LTE Band 2	0	0.007	0.002	0.009	ΣSAR<1.6, Not required
		LTE Band 4	0	0.009	0.002	0.011	ΣSAR<1.6, Not required
		LTE Band 5	0	0.007	0.002	0.009	ΣSAR<1.6, Not required
		LTE Band 12	0	0.008	0.002	0.010	ΣSAR<1.6, Not required
		LTE Band 13	0	0.008	0.002	0.010	ΣSAR<1.6, Not required

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Left side WWAN + Bluetooth

No.	Position	Conditions	Distance (mm)	Max. WWAN	BT	SAR Sum	SPLSR
15	Left side	WCDMA Band II	0	0.389	0.010	0.399	ΣSAR<1.6, Not required
		WCDMA Band V	0	0.405	0.010	0.415	ΣSAR<1.6, Not required
		LTE Band 2	0	0.307	0.010	0.317	ΣSAR<1.6, Not required
		LTE Band 4	0	0.358	0.010	0.368	ΣSAR<1.6, Not required
		LTE Band 5	0	0.362	0.010	0.372	ΣSAR<1.6, Not required
		LTE Band 12	0	0.404	0.010	0.414	ΣSAR<1.6, Not required
		LTE Band 13	0	0.389	0.010	0.399	ΣSAR<1.6, Not required

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is ≦ 0.04 for all circumstances that require SPLSR calculation.

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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	D750V3	1078	Jun.20,2018	Jun.19,2019
		D835V2	4d120	Jun.20,2018	Jun.19,2019
		D1750V2	1023	Jun.11,2018	Jun.10,2019
		D1900V2	5d173	Apr.25,2018	Apr.24,2019
		D2450V2	727	Apr.24,2018	Apr.23,2019
		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	ELI	N/A	Calibration not required	Calibration not required
Agilent	Network Analyzer	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.15,2018	Mar.14,2019
Agilent	Power Meter	E4417A	MY52240003	Feb.01,2018	Jan.31,2019

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
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	6201061014	Mar.14,2018	Mar.13,2019
R&S	Radio Communication Test	CMW 500	143913	Apr.29.2018	Apr.28.2019

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5. Measurements

Date: 2018/11/28

WCDMA Band II_Body_Back side_CH 9538_0mm

Communication System: WCDMA; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1908 MHz; σ = 1.512 S/m; ε_r = 52.51; 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(7.52, 7.52, 7.52); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.53 W/kg

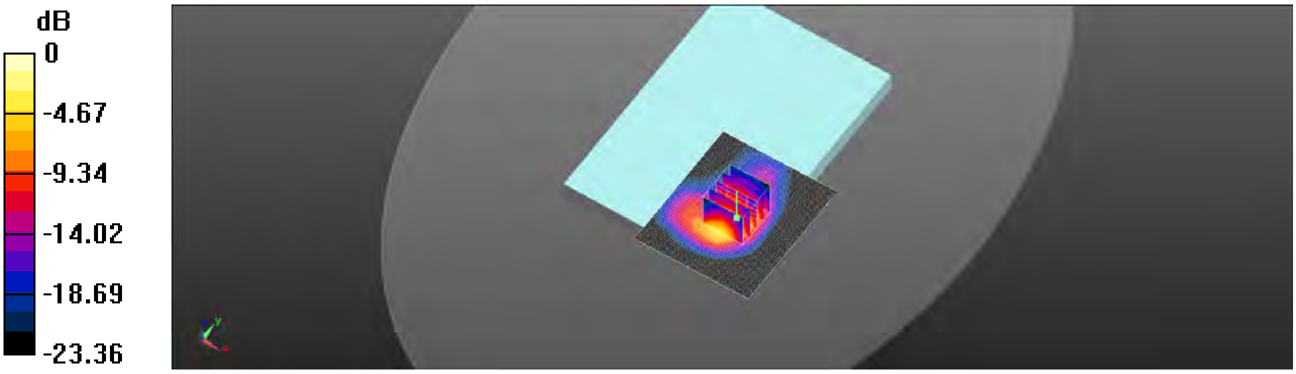
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.443 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.87 W/kg

SAR(1 g) = 0.977 W/kg; SAR(10 g) = 0.446 W/kg

Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.42 W/kg = 1.51 dBW/kg

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Date: 2018/11/26

WCDMA Band V_Body_Back side_CH 4233_0mm

Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used: f = 847 MHz; σ = 1.019 S/m; ε_r = 54.895; 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(9.56, 9.56, 9.56); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.39 W/kg

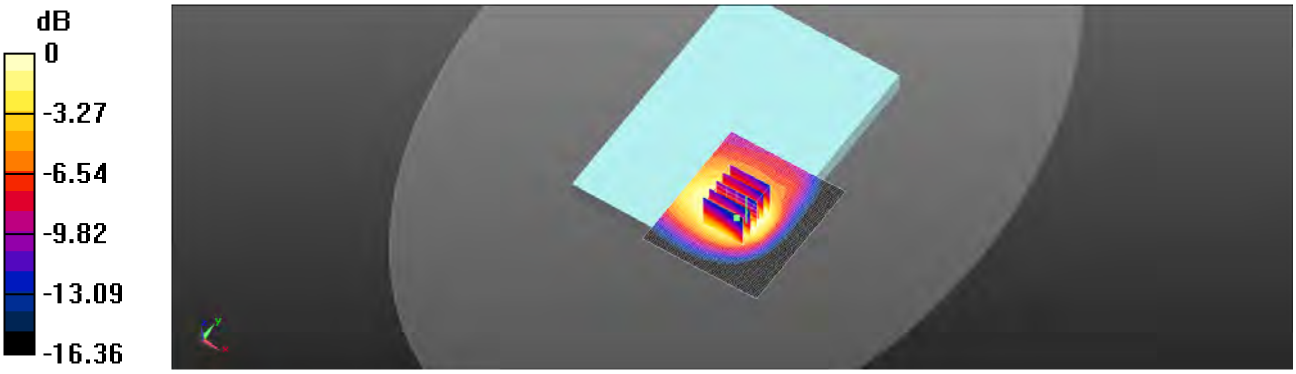
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.49 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.75 W/kg

SAR(1 g) = 0.959 W/kg; SAR(10 g) = 0.606 W/kg

Maximum value of SAR (measured) = 1.33 W/kg



0 dB = 1.33 W/kg = 1.25 dBW/kg

Date: 2018/11/28

LTE Band 2 (20MHz)_Body_Back side_CH 18900_QPSK_1-99_0mm

Communication System: LTE; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.499 S/m; ε_r = 52.615; 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(7.52, 7.52, 7.52); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.59 W/kg

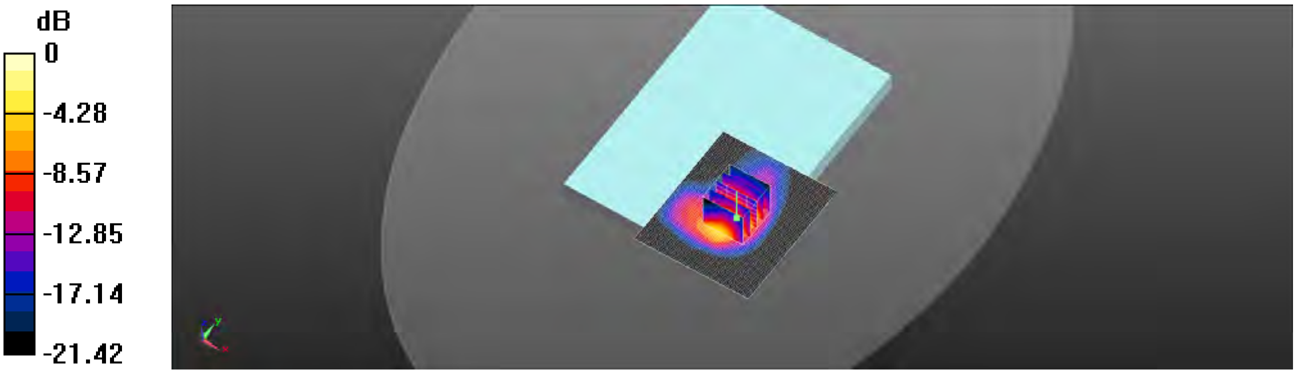
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.713 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 0.987 W/kg; SAR(10 g) = 0.451 W/kg

Maximum value of SAR (measured) = 1.45 W/kg



0 dB = 1.45 W/kg = 1.62 dBW/kg

Date: 2018/11/27

LTE Band 4 (20MHz)_Body_Back side_CH 20050_QPSK_1-0_0mm

Communication System: LTE; Frequency: 1720 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1720 MHz; σ = 1.422 S/m; ε_r = 53.076; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.6°C; Liquid temperature: 21.8°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: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.72 W/kg

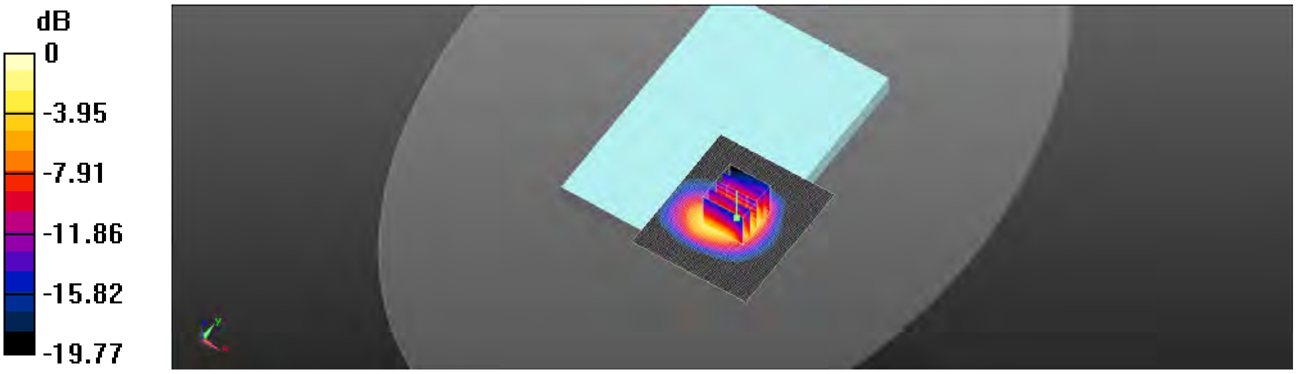
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.317 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.79 W/kg

SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.506 W/kg

Maximum value of SAR (measured) = 1.38 W/kg



0 dB = 1.38 W/kg = 1.41 dBW/kg

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Date: 2018/11/26

LTE Band 5 (10MHz)_Body_Back side_CH 20525_QPSK_1-25_0mm

Communication System: LTE; Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium parameters used: f = 836.5 MHz; σ = 1.011 S/m; ε_r = 55.022; 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(9.56, 9.56, 9.56); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.82 W/kg

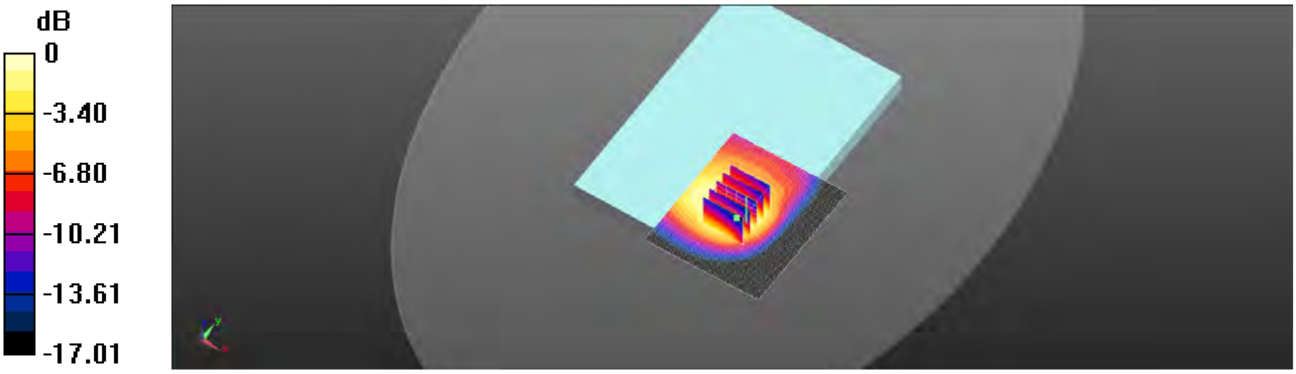
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.90 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 2.18 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.701 W/kg

Maximum value of SAR (measured) = 1.57 W/kg



0 dB = 1.57 W/kg = 1.97 dBW/kg

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Date: 2018/11/25

LTE Band 12 (10MHz)_Body_Back side_CH 23130_QPSK_1-25_0mm

Communication System: LTE; Frequency: 711 MHz; Duty Cycle: 1:1

Medium parameters used: f = 711 MHz; σ = 0.939 S/m; ε_r = 56.315; 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(9.72, 9.72, 9.72); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.95 W/kg

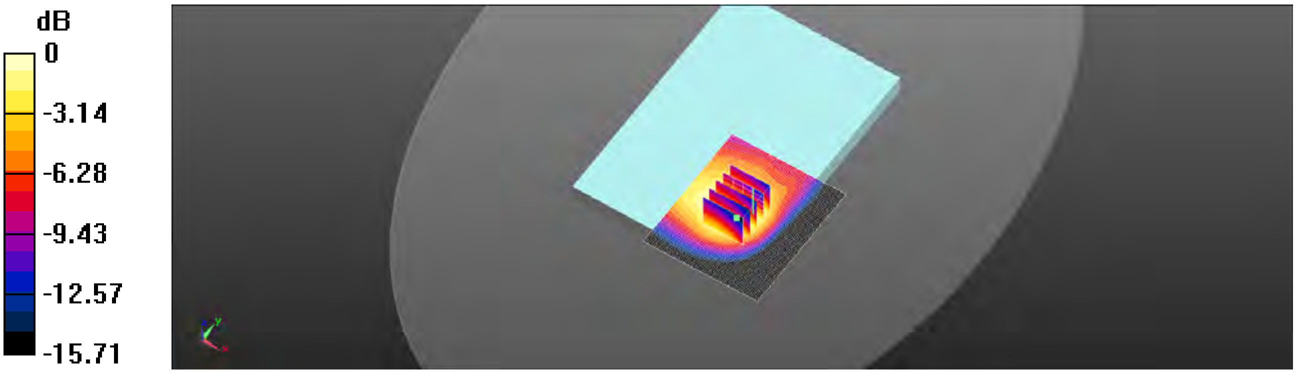
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.13 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.26 W/kg

SAR(1 g) = 1.26 W/kg; SAR(10 g) = 0.829 W/kg

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



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

Date: 2018/11/25

LTE Band 13 (10MHz)_Body_Back side_CH 23230_QPSK_1-0_0mm

Communication System: LTE; Frequency: 782 MHz; Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; σ = 0.942 S/m; ε_r = 56.515; 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(9.72, 9.72, 9.72); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.90 W/kg

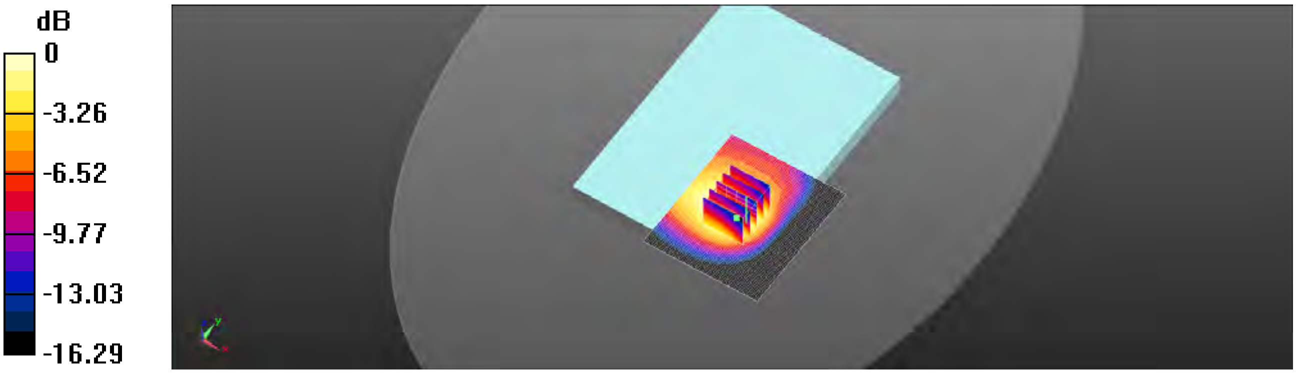
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.25 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 2.18 W/kg

SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.762 W/kg

Maximum value of SAR (measured) = 1.60 W/kg



0 dB = 1.60 W/kg = 2.05 dBW/kg

Date: 2018/11/29

WLAN 802.11b_Body_Bottom side_CH 11_0mm

Communication System: WLAN 2.45G; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 2.021 S/m; ε_r = 52.648; 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(7.3, 7.3, 7.3); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.470 W/kg

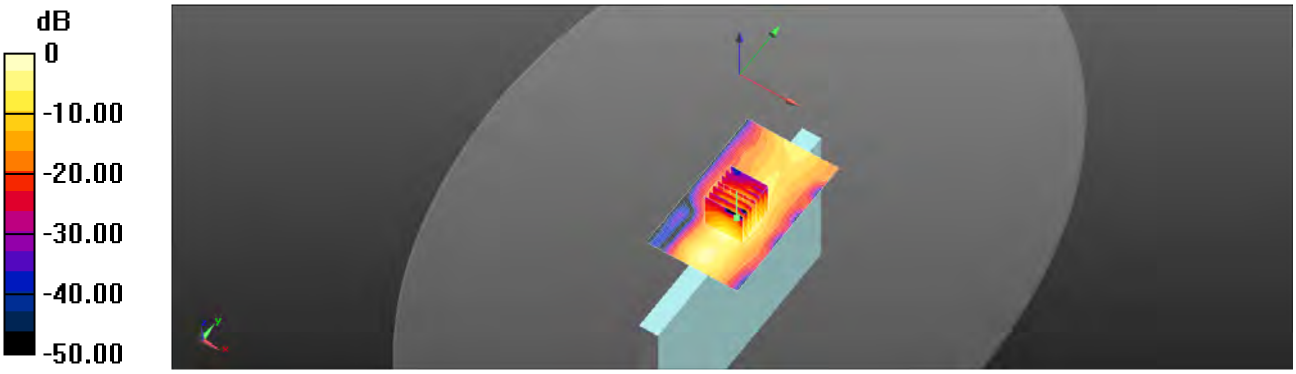
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.755 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.664 W/kg

SAR(1 g) = 0.285 W/kg; SAR(10 g) = 0.108 W/kg

Maximum value of SAR (measured) = 0.461 W/kg



0 dB = 0.461 W/kg = -3.36 dBW/kg

Date: 2018/11/29

Bluetooth(GFSK)_Body_Bottom side_CH 0_0mm

Communication System: Bluetooth; Frequency: 2402 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2402 MHz; σ = 1.939 S/m; ε_r = 52.885; 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(7.3, 7.3, 7.3); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0793 W/kg

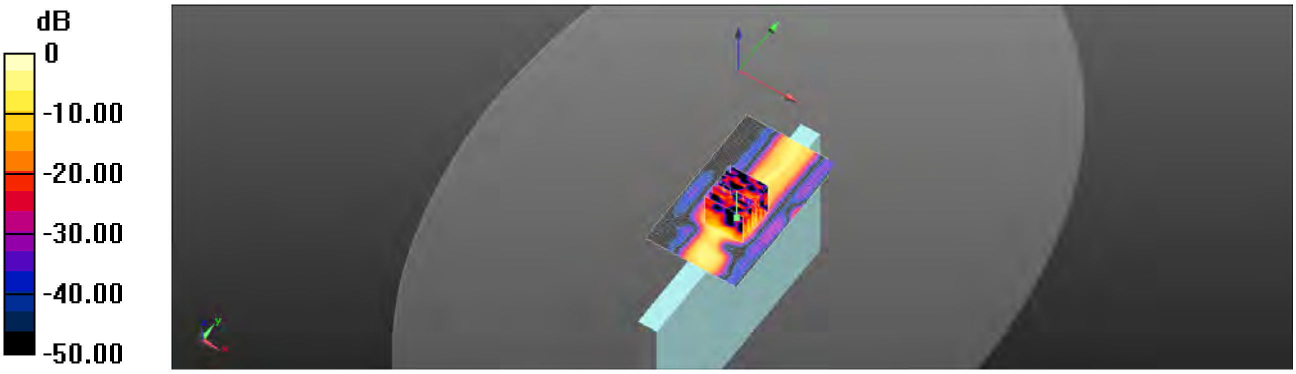
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.557 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.0780 W/kg

SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.012 W/kg

Maximum value of SAR (measured) = 0.0608 W/kg



0 dB = 0.0608 W/kg = -12.16 dBW/kg

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Date: 2018/11/30

WLAN 802.11n(40M) 5.2G_Body_Left side_CH 46_0mm

Communication System: WLAN 5G; Frequency: 5230 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5230 MHz; σ = 5.162 S/m; ε_r = 47.317; 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(4.23, 4.23, 4.23); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x111x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.526 W/kg

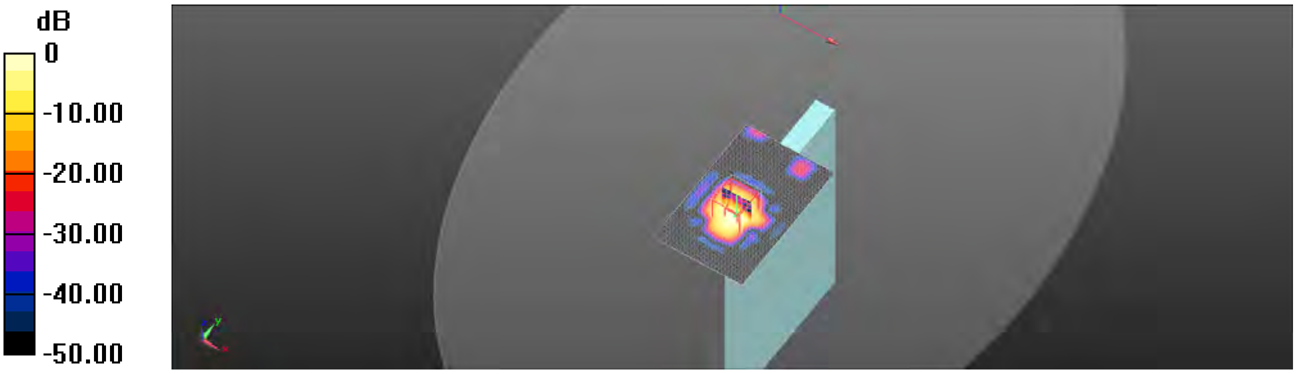
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.5470 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.830 W/kg

SAR(1 g) = 0.186 W/kg; SAR(10 g) = 0.044 W/kg

Maximum value of SAR (measured) = 0.429 W/kg



0 dB = 0.429 W/kg = -3.68 dBW/kg

Date: 2018/12/1

WLAN 802.11a 5.3G_Body_Left side_CH 60_0mm

Communication System: WLAN 5G; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5300 MHz; σ = 5.372 S/m; ε_r = 47.153; 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(4.23, 4.23, 4.23); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x111x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 1.41 W/kg

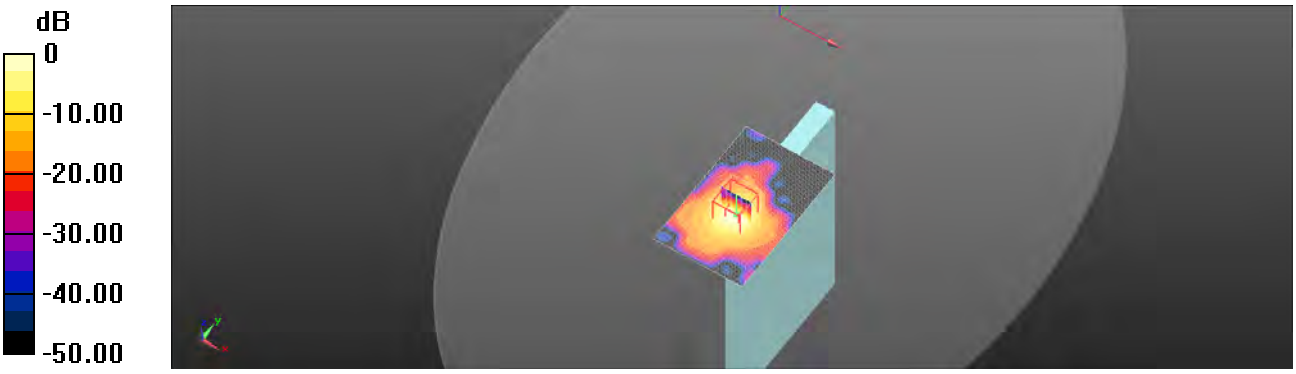
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.5380 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 2.71 W/kg

SAR(1 g) = 0.639 W/kg; SAR(10 g) = 0.159 W/kg

Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.42 W/kg = 1.53 dBW/kg

Date: 2018/12/2

WLAN 802.11a 5.6G_Body_Left side_CH 136_0mm

Communication System: WLAN 5G; Frequency: 5680 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5680 MHz; σ = 5.934 S/m; ε_r = 47.883; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.5°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: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x111x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 1.32 W/kg

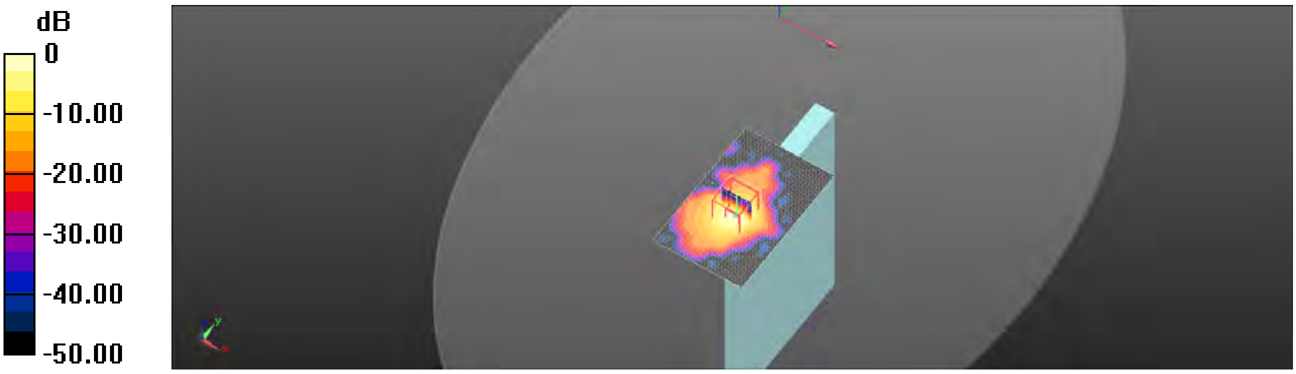
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.479 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 3.01 W/kg

SAR(1 g) = 0.648 W/kg; SAR(10 g) = 0.154 W/kg

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



0 dB = 1.51 W/kg = 1.78 dBW/kg

Date: 2018/12/3

WLAN 802.11a 5.8G_Body_Back side_CH 165_0mm

Communication System: WLAN 5G; Frequency: 5825 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5825 MHz; σ = 5.976 S/m; ε_r = 46.997; 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(4, 4, 4); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (81x121x1): Interpolated grid: dx=10 mm, dy=10 mm

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

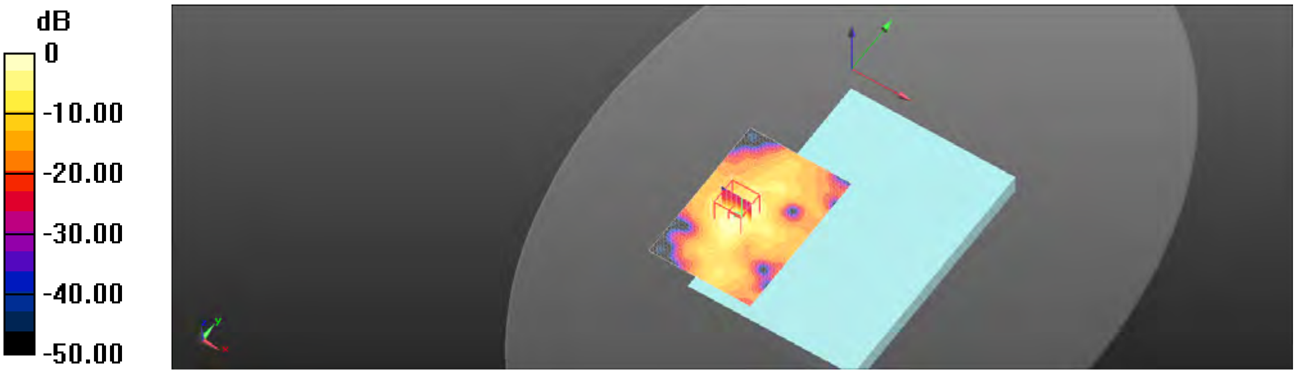
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.518 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 4.73 W/kg

SAR(1 g) = 0.750 W/kg; SAR(10 g) = 0.188 W/kg

Maximum value of SAR (measured) = 2.04 W/kg



0 dB = 2.04 W/kg = 3.09 dBW/kg

6. SAR System Performance Verification

Date: 2018/11/25

Dipole 750 MHz_SN:1078

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.941S/m; ε_r = 56.255; 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(9.72, 9.72, 9.72); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (51x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.40 W/kg

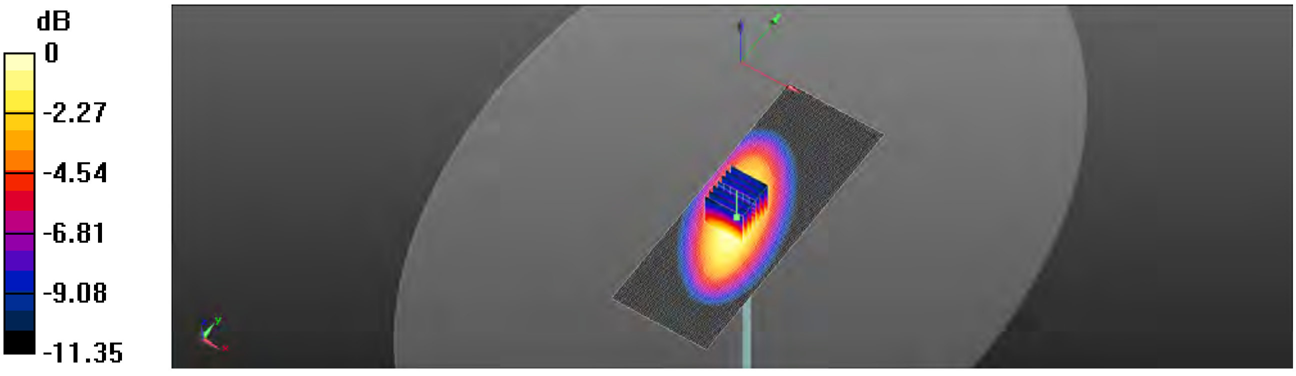
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.43 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 3.04 W/kg

SAR(1 g) = 2.19 W/kg; SAR(10 g) = 1.39 W/kg

Maximum value of SAR (measured) = 2.56 W/kg



0 dB = 2.56 W/kg = 4.09 dBW/kg

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Date: 2018/12/9

Dipole 750 MHz_SN:1078

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.945 S/m; ε_r = 56.001; 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(9.72, 9.72, 9.72); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (51x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.39 W/kg

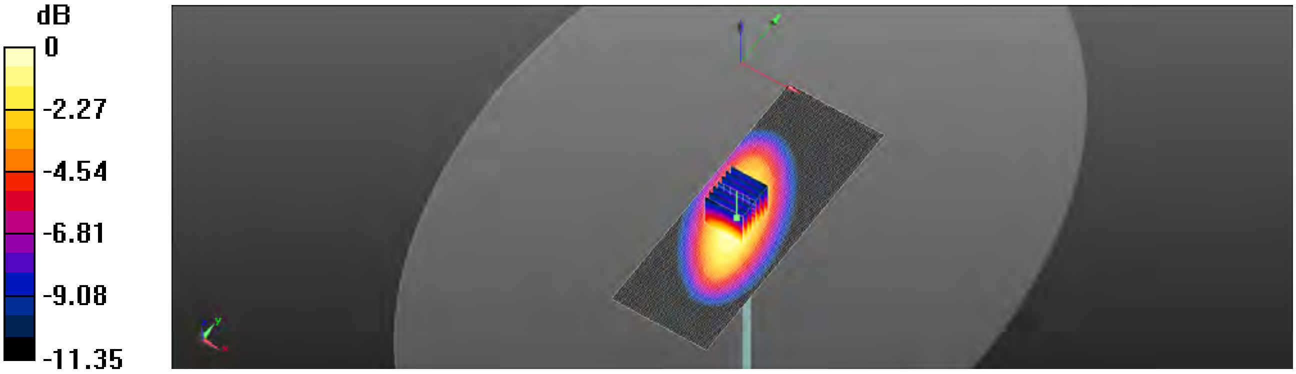
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.23 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 3.01 W/kg

SAR(1 g) = 2.17 W/kg; SAR(10 g) = 1.37 W/kg

Maximum value of SAR (measured) = 2.53 W/kg



0 dB = 2.53 W/kg = 4.06 dBW/kg

Date: 2018/11/26

Dipole 835 MHz_SN:4d120

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 1.009 S/m; ε_r = 55.123; 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(9.56, 9.56, 9.56); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 3.15 W/kg

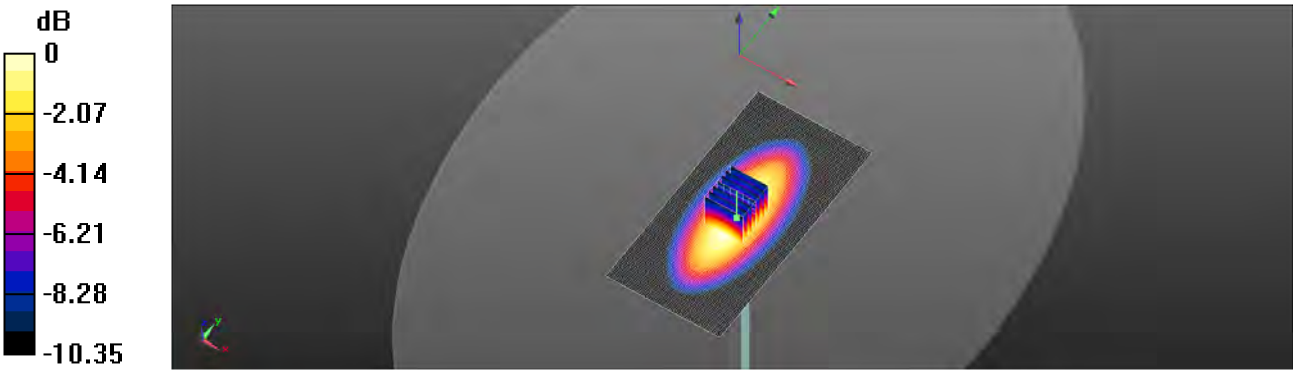
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.63 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.69 W/kg

SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.63 W/kg

Maximum value of SAR (measured) = 3.14 W/kg



0 dB = 3.14 W/kg = 4.96 dBW/kg

Date: 2018/12/9

Dipole 835 MHz_SN:4d120

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 1.011 S/m; ε_r = 54.824; 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(9.56, 9.56, 9.56); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 3.11 W/kg

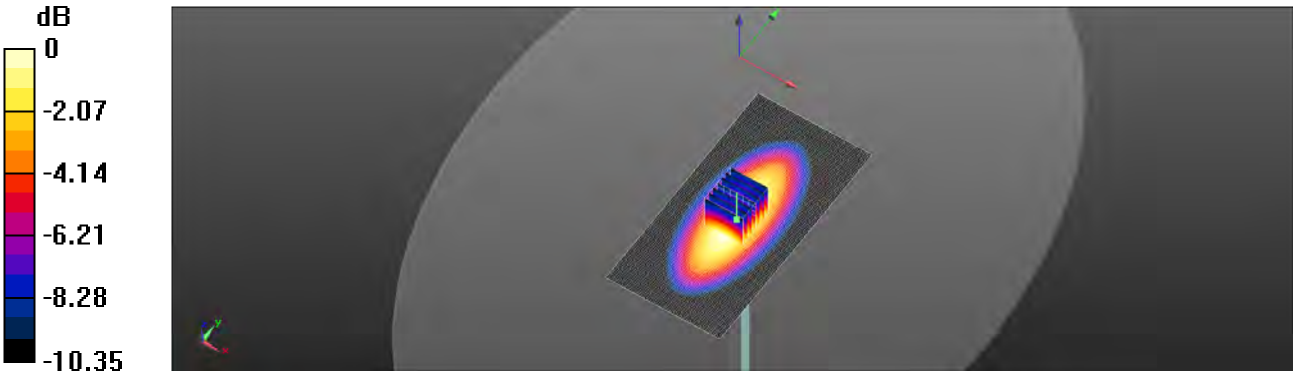
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.51 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.62 W/kg

SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg

Maximum value of SAR (measured) = 3.12 W/kg



0 dB = 3.12 W/kg = 4.92 dBW/kg

Date: 2018/11/27

Dipole 1750 MHz_SN:1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.452 S/m; ε_r = 52.765; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.6°C; Liquid temperature: 21.8°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: ELI
- 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) = 13.2 W/kg

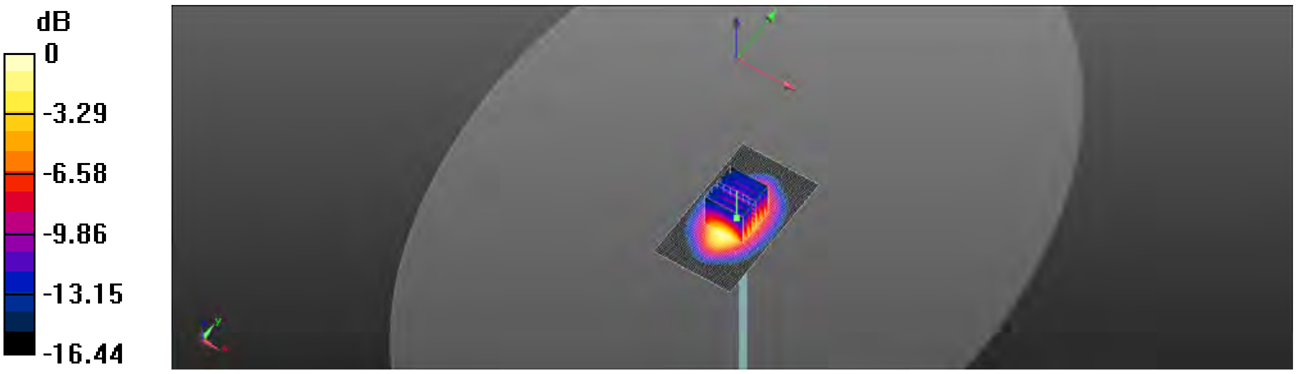
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.40 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 15.7 W/kg

SAR(1 g) = 9.03 W/kg; SAR(10 g) = 4.87 W/kg

Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.98 dBW/kg

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Date: 2018/12/10

Dipole 1750 MHz_SN:1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.462 S/m; ε_r = 52.497; 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(7.83, 7.83, 7.83); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 13.1 W/kg

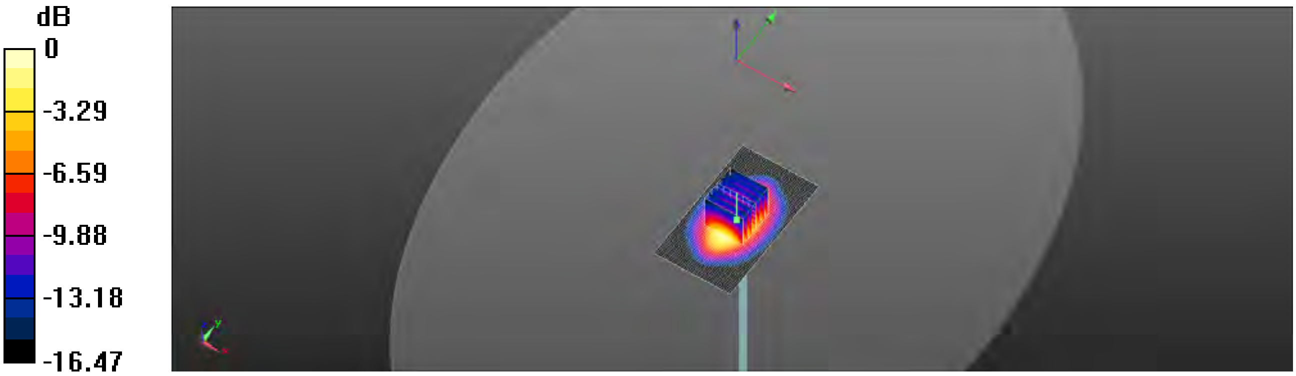
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.10 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 15.5 W/kg

SAR(1 g) = 9.01 W/kg; SAR(10 g) = 4.85 W/kg

Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.78 dBW/kg

Date: 2018/11/28

Dipole 1900 MHz_SN:5d173

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.501 S/m; ε_r = 52.605; 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(7.52, 7.52, 7.52); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 14.0 W/kg

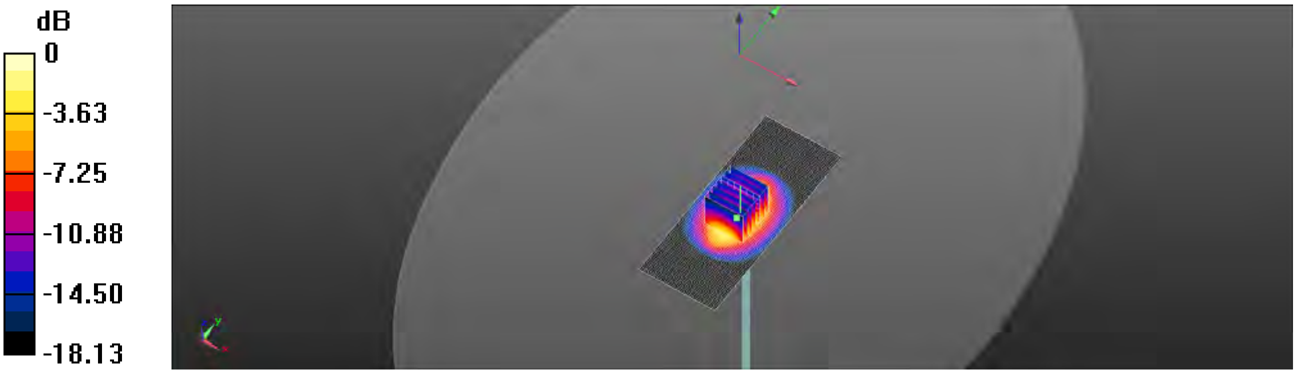
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.69 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.92 W/kg; SAR(10 g) = 5.29 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

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Date: 2018/12/10

Dipole 1900 MHz_SN:5d173

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.511 S/m; ε_r = 52.568; 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(7.52, 7.52, 7.52); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 14.5 W/kg

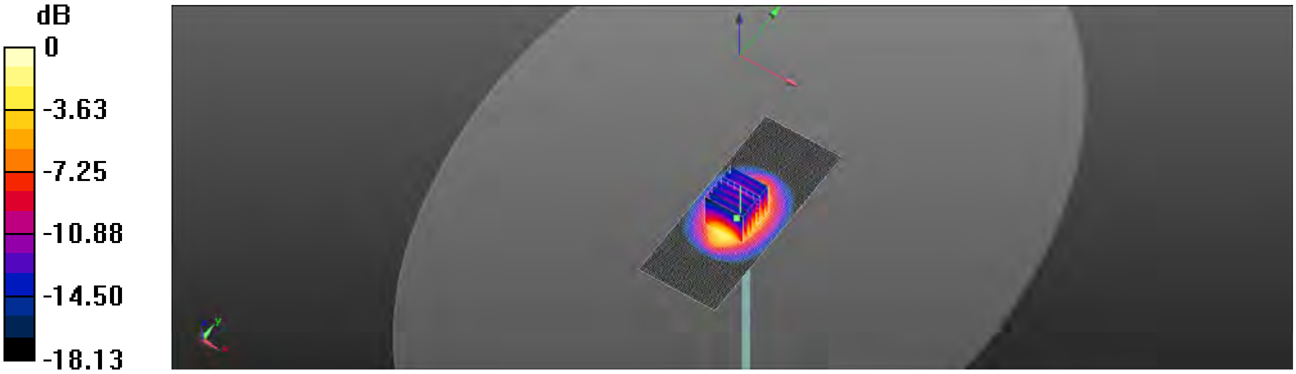
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.88 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 9.94 W/kg; SAR(10 g) = 5.31 W/kg

Maximum value of SAR (measured) = 13.6 W/kg



0 dB = 13.6 W/kg = 11.39 dBW/kg

Date: 2018/11/29

Dipole 2450 MHz_SN:727

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 2.019 S/m; ε_r = 52.668; 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(7.3, 7.3, 7.3); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 20.3 W/kg

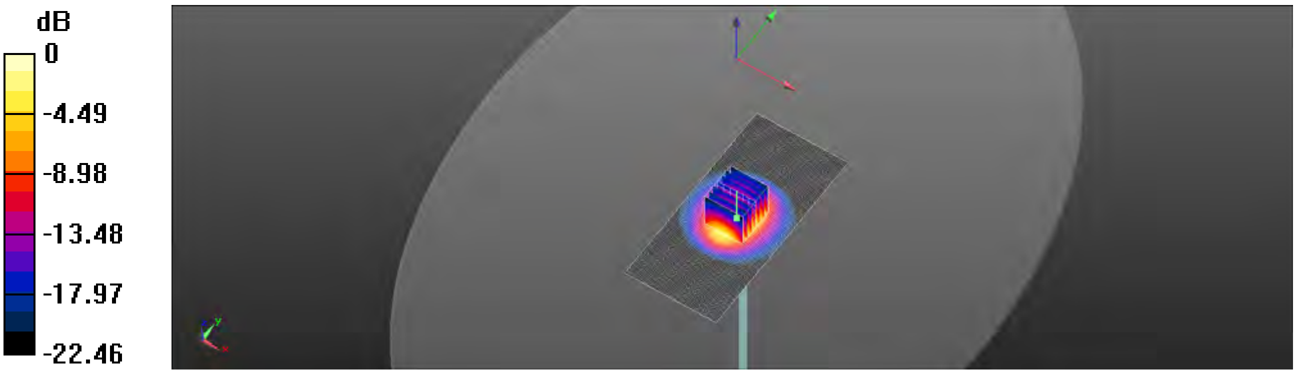
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.83 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 26.1 W/kg

SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.97 W/kg

Maximum value of SAR (measured) = 19.3 W/kg



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

Date: 2018/12/11

Dipole 2450 MHz_SN:727

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 2.026 S/m; ε_r = 52.54; 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(7.3, 7.3, 7.3); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 20.1 W/kg

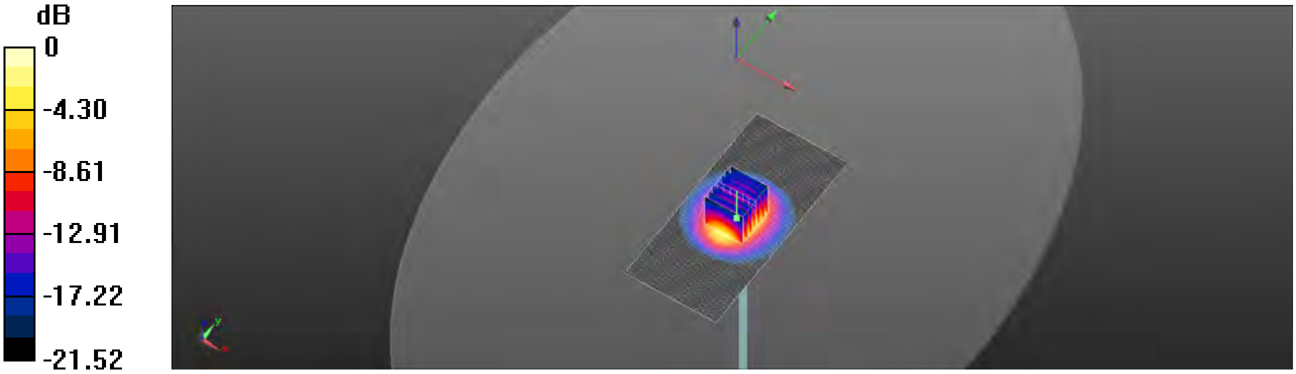
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.63 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 25.8 W/kg

SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.95 W/kg

Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.1 W/kg = 12.76 dBW/kg

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Date: 2018/11/30

Dipole 5200 MHz_SN:1023

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5200 MHz; σ = 5.159 S/m; ε_r = 47.323; 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(4.23, 4.23, 4.23); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 14.9 W/kg

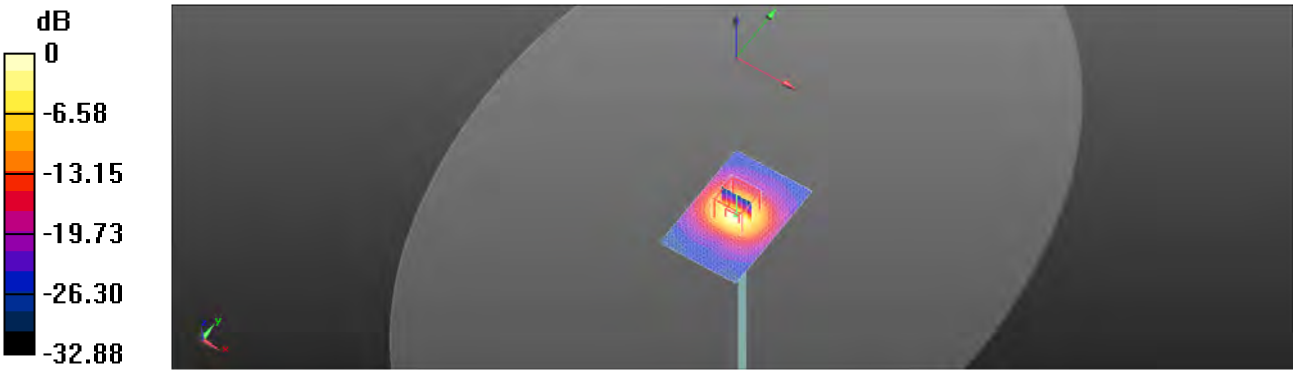
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.12 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 27.6 W/kg

SAR(1 g) = 7.11 W/kg; SAR(10 g) = 1.95 W/kg

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



0 dB = 14.5 W/kg = 11.60 dBW/kg

Date: 2018/12/11

Dipole 5200 MHz_SN:1023

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5200 MHz; σ = 5.167 S/m; ε_r = 47.205; 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: ELI
- 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) = 14.8 W/kg

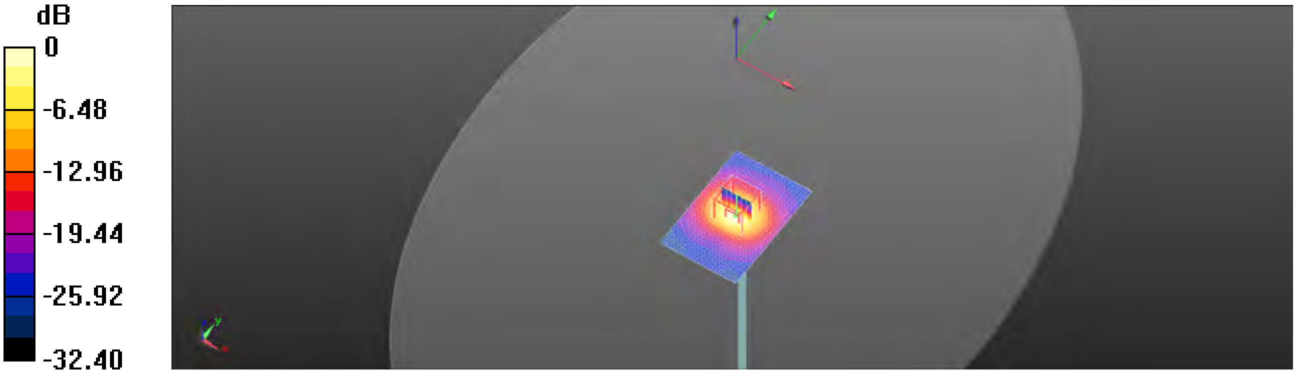
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.01 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 27.4 W/kg

SAR(1 g) = 7.09 W/kg; SAR(10 g) = 1.93 W/kg

Maximum value of SAR (measured) = 14.1 W/kg



0 dB = 14.1 W/kg = 11.58 dBW/kg

Date: 2018/12/1

Dipole 5300 MHz_SN:1023

Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5300 MHz; σ = 5.372 S/m; ε_r = 47.153; 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(4.23, 4.23, 4.23); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 15.3 W/kg

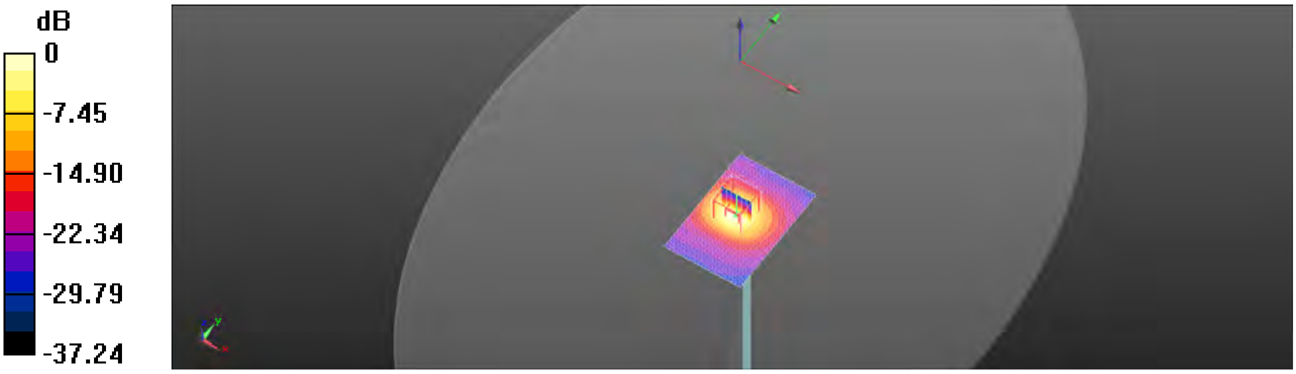
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 47.61 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 31.0 W/kg

SAR(1 g) = 7.38 W/kg; SAR(10 g) = 2.07 W/kg

Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.98 dBW/kg

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Date: 2018/12/11

Dipole 5300 MHz_SN:1023

Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5300 MHz; σ = 5.379 S/m; ε_r = 46.977; 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: ELI
- 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) = 15.6 W/kg

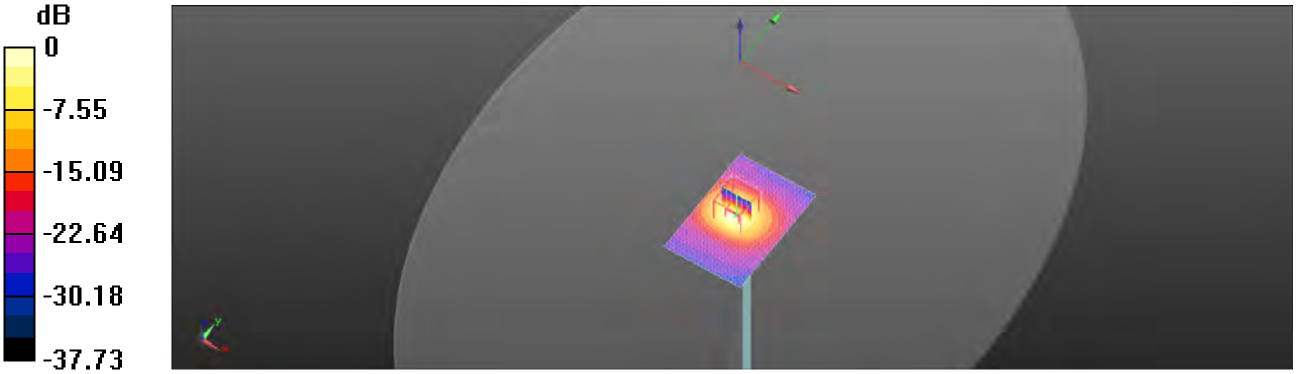
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 47.91 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 31.6 W/kg

SAR(1 g) = 7.41 W/kg; SAR(10 g) = 2.11 W/kg

Maximum value of SAR (measured) = 15.9 W/kg



0 dB = 15.9 W/kg = 11.99 dBW/kg

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Date: 2018/12/2

Dipole 5600 MHz_SN:1023

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5600 MHz; σ = 5.933 S/m; ε_r = 47.893; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.5°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: ELI
- 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) = 17.0 W/kg

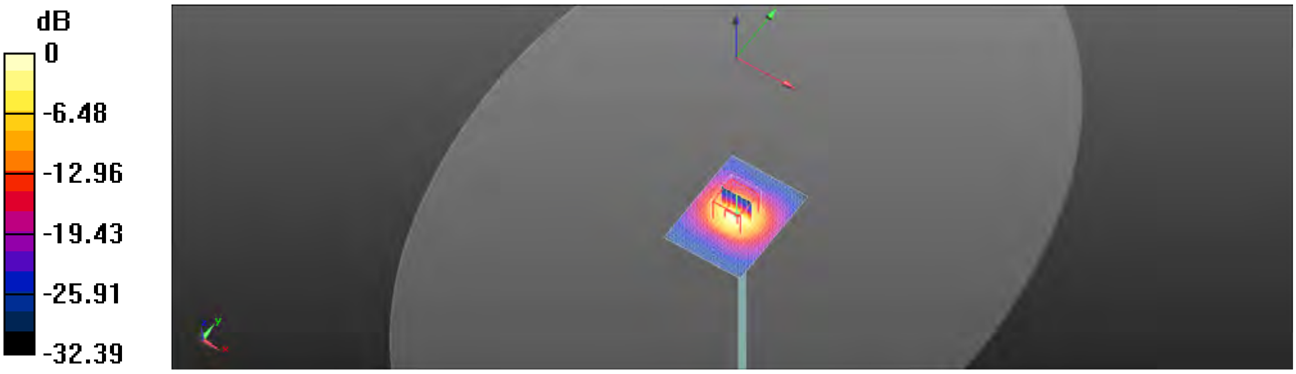
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 58.76 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 32.7 W/kg

SAR(1 g) = 7.81 W/kg; SAR(10 g) = 2.2 W/kg

Maximum value of SAR (measured) = 16.7 W/kg



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

Date: 2018/12/11

Dipole 5600 MHz_SN:1023

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5600 MHz; σ = 5.933 S/m; ε_r = 47.722; 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, 4, 4); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 17.4 W/kg

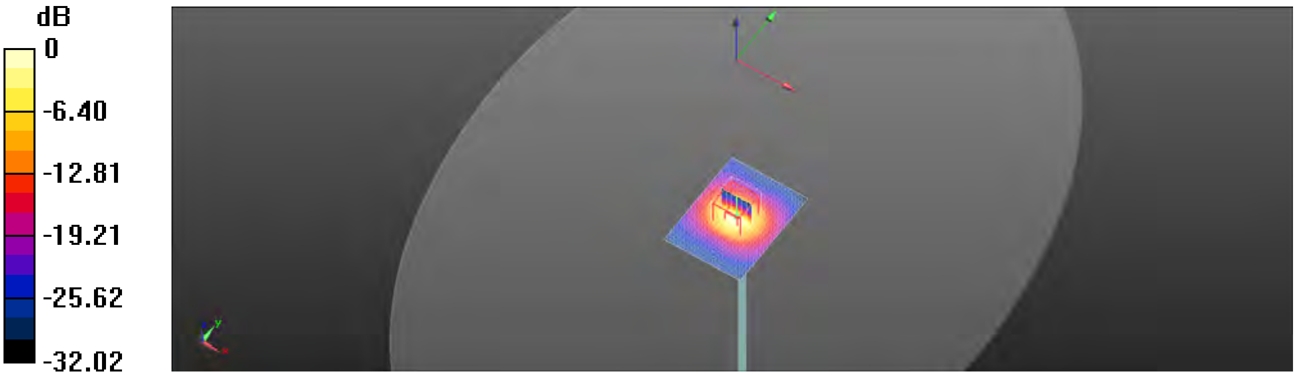
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 58.94 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 33.1 W/kg

SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.24 W/kg

Maximum value of SAR (measured) = 17.1 W/kg



0 dB = 17.1 W/kg = 12.63 dBW/kg

Date: 2018/12/3

Dipole 5800 MHz_SN:1023

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5800 MHz; σ = 5.971 S/m; ε_r = 47.011; 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(4, 4, 4); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 15.6 W/kg

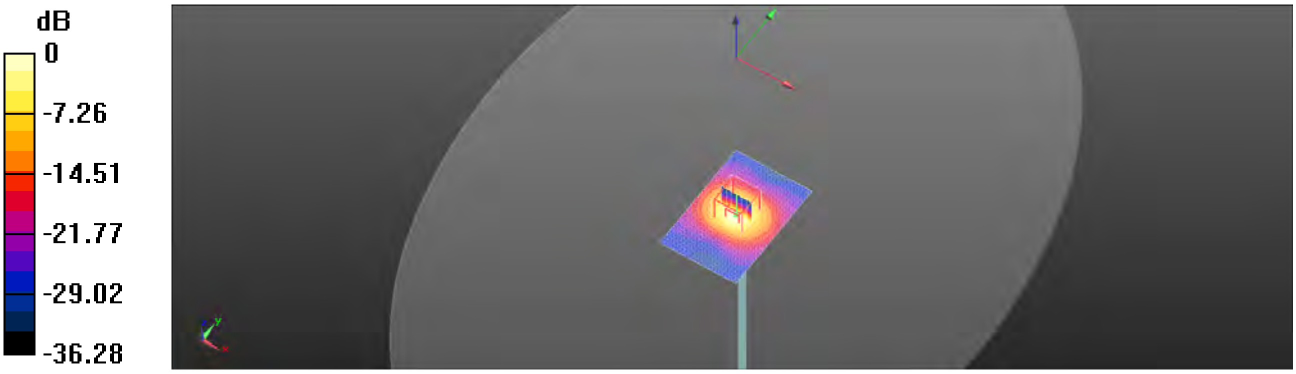
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 53.97 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 7.42 W/kg; SAR(10 g) = 2.05 W/kg

Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.98 dBW/kg

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Date: 2018/12/11

Dipole 5800 MHz_SN:1023

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5800 MHz; σ = 5.972 S/m; ε_r = 46.72; 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, 4, 4); Calibrated: 2018/10/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: ELI
- 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) = 15.3 W/kg

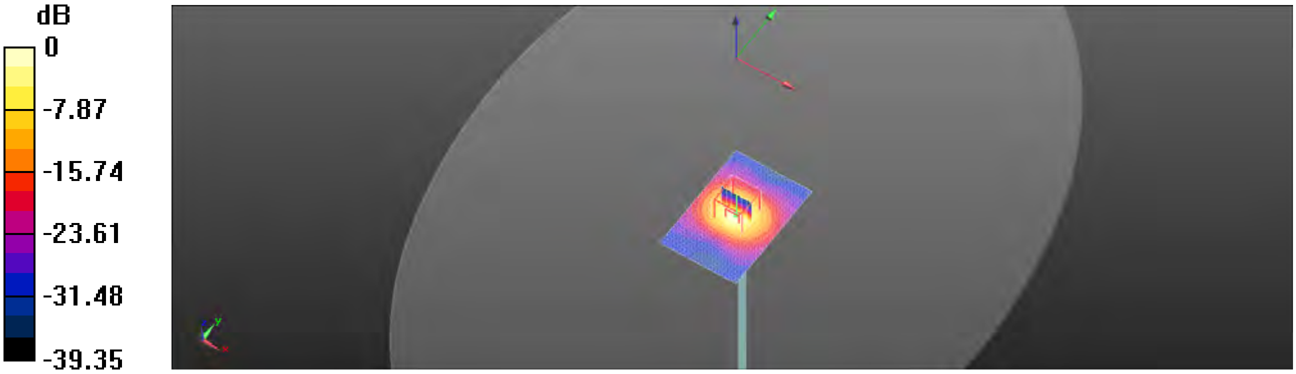
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 53.61 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 31.8 W/kg

SAR(1 g) = 7.39 W/kg; SAR(10 g) = 2.01 W/kg

Maximum value of SAR (measured) = 15.5 W/kg



0 dB = 15.5 W/kg = 11.77 dBW/kg

7. DAE & Probe Calibration Certificate

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

ilac-MRA

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

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

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

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

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Accreditation No.: SCS 0108

Glossary

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

Methods Applied and Interpretation of Parameters

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

DC Voltage Measurement

A/D - Converter Resolution nominal
High Range: 1LSB = 6.1μV, full range = -100...+300 mV
Low Range: 1LSB = 61nV, full range = -1.......+3mV
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.344 ± 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	8.65	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	-2.05	-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	2001.55	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	-	5.46
Channel Z	200	8.44	6.31	-

Certificate No: DAE4-1336_Aug18 Page 4 of 5

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

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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

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

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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	58.09	438.9	35.15	26.09	1.205	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	7.53	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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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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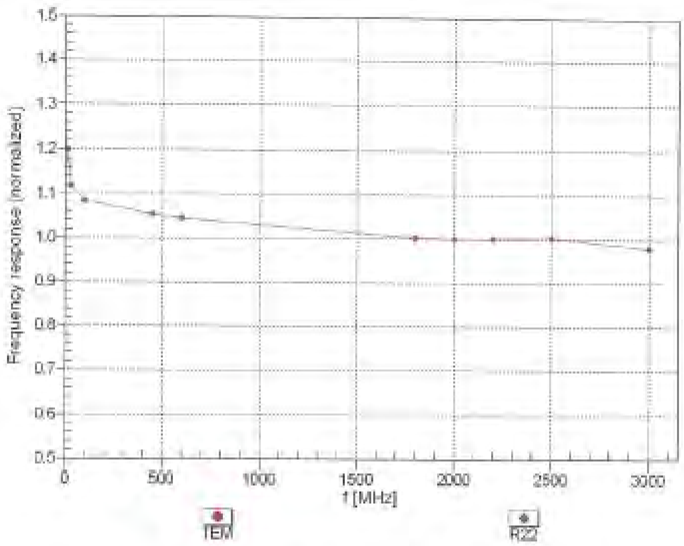
EX3DV4– SN:3938 October 24, 2018

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



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

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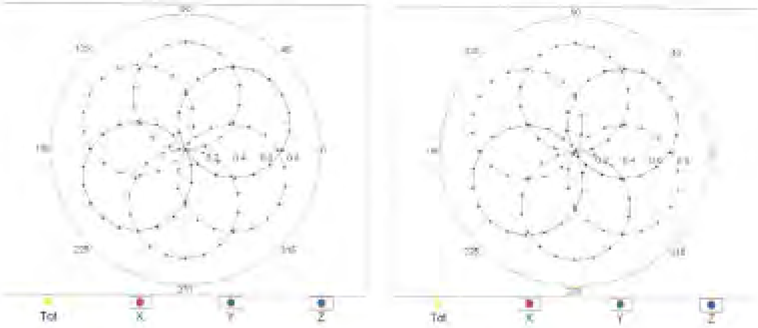
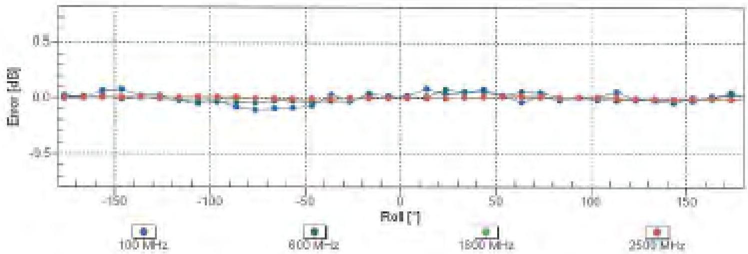
EX3DV4– SN:3938 October 24, 2018

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM f=1800 MHz,R22





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

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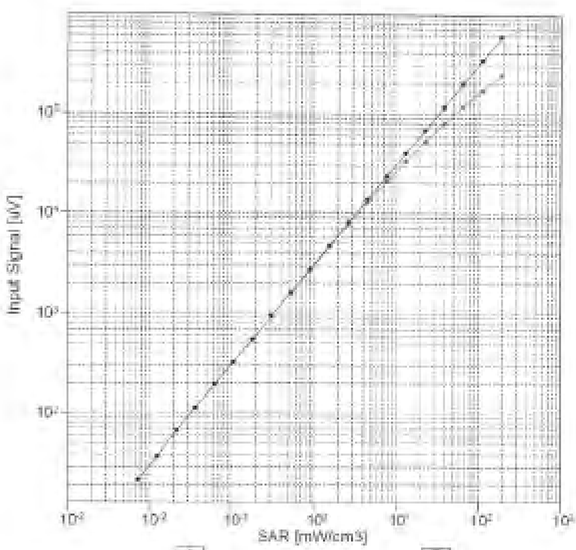
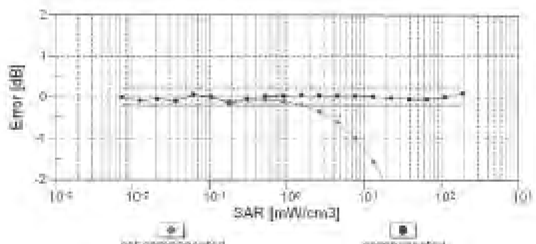
Dynamic Range f(SAR_{head})

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





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

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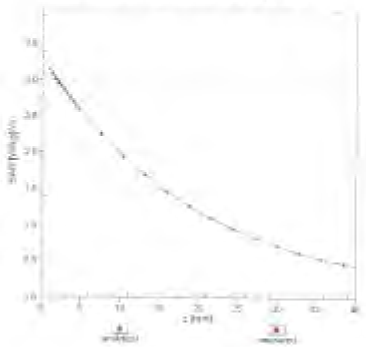
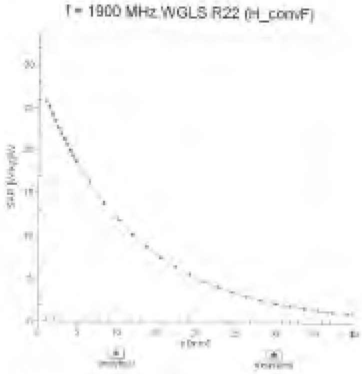
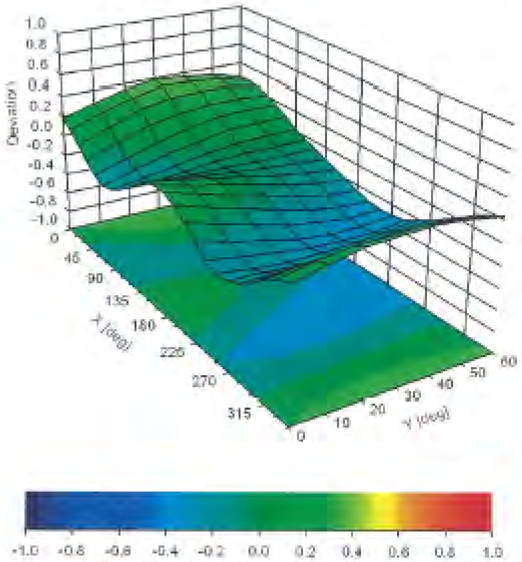
Conversion Factor Assessment





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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EX3DV4– SN:3938 October 24, 2018

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	10.38	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	18.50		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	18.92		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	92.86	20.36		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	31.82	111.52	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	2.58	74.38	16.81		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	49.56	114.02	30.85		70.0	
		Z	8.61	95.86	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	80.65	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	78.68	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	77.70	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	13.26		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	16.88		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	100.00	118.79	31.19	10.79	40.0	± 9.6 %
		Y	42.73	105.35	27.59		40.0	
		Z	6.52	75.70	16.44		40.0	
10058-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	0.86	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	6.54	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	75.88	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	15.30		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	2.37	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	66.85	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	16.48		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.33	67.58	16.60	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	67.54	16.48		150.0	
		Z	5.41	67.68	16.55		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.30	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	68.24	16.42	0.00	150.0	± 9.6 %
		Y	3.29	66.88	15.49		150.0	
		Z	3.39	68.16	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	14.75		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	65.60	13.59		150.0	
		Z	2.29	67.85	14.87		150.0	
10145-CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	1.73	68.80	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	2.48	65.71	13.45		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	81.90	19.47	0.00	150.0	± 9.6 %
		Y	3.10	71.79	14.97		150.0	
		Z	3.29	72.21	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	69.67	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	68.69	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	67.36	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	19.76		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	76.01	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	103.18	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	67.18	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	4.43	67.01	16.18		150.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.85	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	67.35	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	5.08	66.87	16.16		150.0	
		Z	5.06	67.45	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	28.50	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	25.26	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	25.00	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	33.72	6.02	65.0	± 9.6 %
		Y	25.93	102.87	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	28.06	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	11.80	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	8.29	83.62	27.37	6.98	65.0	± 9.6 %
		Y	7.69	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	82.50	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	7.96	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	5.93	73.77	19.14		65.0	
10252-CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	12.21	89.16	25.80	3.98	65.0	± 9.6 %
		Y	8.34	84.33	23.86		65.0	
		Z	7.06	80.06	21.46		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	6.93	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	18.88		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	20.67		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	± 9.6 %
		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	65.81	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	2.82	62.17	7.82		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	14.82	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	17.08	0.00	150.0	± 9.6 %
		Y	1.30	65.83	12.24		150.0	
		Z	1.79	72.49	15.66		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	1.16	70.51	15.68	0.00	150.0	± 9.6 %
		Y	0.67	63.17	10.49		150.0	
		Z	0.94	68.71	13.90		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	119.82	28.51		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	12.27	89.66	26.60	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	4.86	77.12	18.36	0.00	150.0	± 9.6 %
		Y	3.14	71.60	15.64		150.0	
		Z	3.76	74.00	17.70		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	66.29	12.46		150.0	
		Z	2.17	66.32	11.82		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	5.32	66.98	18.36	4.17	50.0	± 9.6 %
		Y	5.22	66.88	18.11		50.0	
		Z	4.67	65.81	17.38		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	72.48	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	16.60	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	4.51	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	16.56	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	4.86	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	67.52	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	18.66	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	66.66	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	15.99	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	65.45	16.13	0.00	150.0	± 9.6 %
		Y	3.72	64.89	15.67		150.0	
		Z	3.74	65.60	15.98		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	4.25	73.12	18.40		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	69.44	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	33.33	3.29	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	25.98	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	6.99		80.0	
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	102.34	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	6.99		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	108.94	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	108.29	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	17.02		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	89.38	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-AAE	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	9.78	83.78	21.08		80.0	
		Z	3.87	71.04	15.19		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	72.38	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	19.56	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	3.08	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	4.88	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	4.21	69.40	17.63		80.0	
		Z	3.63	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	84.28	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	6.85	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	70.59	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	17.56		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	66.57	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	66.81	16.26	0.00	150.0	± 9.6 %
		Y	5.14	66.24	15.88		150.0	
		Z	5.12	66.86	16.13		150.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.18	66.81	16.25	0.00	150.0	± 9.6 %
		Y	5.01	66.19	15.84		150.0	
		Z	5.00	66.84	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	66.06	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	5.58	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	16.29		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	4.88	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	17.58	0.46	130.0	± 9.6 %
		Y	1.16	64.80	15.39		130.0	
		Z	1.19	65.98	16.28		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	1.86	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	66.26	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	5.09	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	16.68	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	10.01		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	16.88		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	16.25		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, MCS5, 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	6.28	68.50	17.18	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		120.0	
		Z	5.67	67.23	16.67		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	5.68	66.48	16.03	0.46	130.0	± 9.6 %
		Y	5.52	65.92	15.67		130.0	
		Z	5.41	66.16	15.62		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	16.68	0.46	130.0	± 9.6 %
		Y	6.11	67.04	16.40		130.0	
		Z	6.00	67.28	16.38		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.23	67.47	16.65	0.46	130.0	± 9.6 %
		Y	6.11	67.00	16.36		130.0	
		Z	6.01	67.28	16.34		130.0	

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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	67.53	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	130.0	± 9.6 %
		Y	6.13	66.85	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	66.82	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	6.66	68.36	17.09		130.0	
		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	66.17	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	121.04	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	68.00	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	67.01	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		50.0	
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		60.0	

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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	17.55	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	107.68	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 (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.)	3.89%	N	1	1	0.64	0.43	2.49%	1.67%	M
Liquid Conductivity (mea.)	4.25%	N	1	1	0.6	0.49	2.55%	2.08%	M
Combined standard uncertainty		RSS					12.25%	12.01%	
Expant uncertainty (95% confidence							24.49%	24.02%	

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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.)	1.97%	N	1	1	0.64	0.43	1.26%	0.85%	M
Liquid Conductivity (mea.)	4.63%	N	1	1	0.6	0.49	2.78%	2.27%	M
Combined standard uncertainty		RSS					11.82%	11.66%	

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9. System Validation from Original Equipment Supplier

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Accreditation No.: **SCS 0108**

Client: **Auden**

Certificate No: **D750V3-1078_Jun18**

CALIBRATION CERTIFICATE

Object: D750V3 - SN:1078

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

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Certificate No: D750V3-1078_Jun18 Page 1 of 8

Calibration Laboratory of
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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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.25 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.38 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.2 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.63 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.72 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	55.8 Ω + 0.6 jΩ
Return Loss	- 25.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.5 Ω - 3.3 jΩ
Return Loss	- 29.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.038 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	November 15, 2012

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DASY5 Validation Report for Head TSL

Date: 14.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1078

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

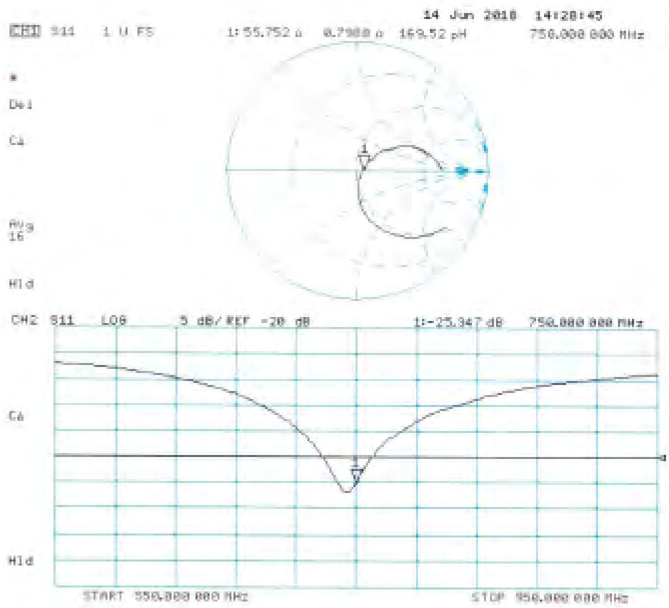
- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 59.18 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.13 W/kg
SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (measured) = 2.79 W/kg

0 dB = 2.79 W/kg = 4.46 dBW/kg

Certificate No: D750V3-1078_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

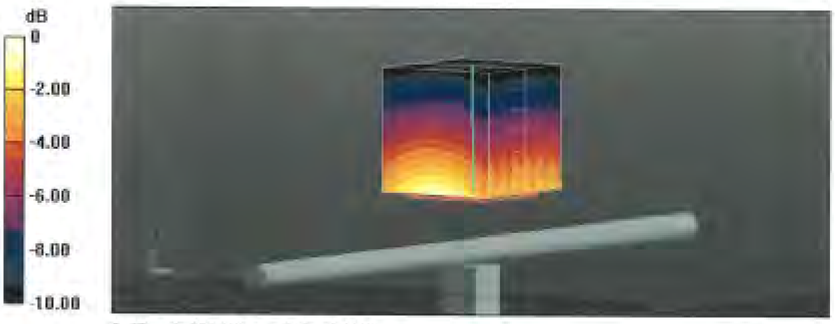
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1078

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19) @ 750 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)

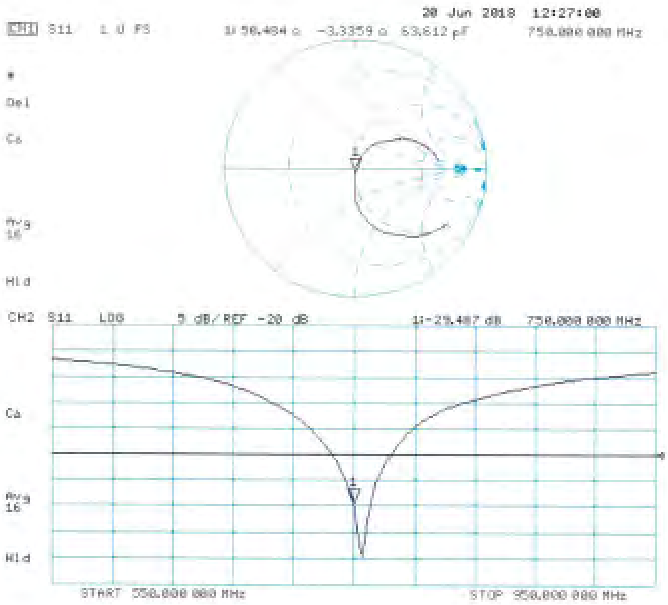
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.54 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Certificate No: D750V3-1078_Jun18 Page 7 of 8

Impedance Measurement Plot for Body TSL



Certificate No: D750V3-1078_Jun18 Page 8 of 8

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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

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Certificate No: D835V2-4d120_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	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

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DASY5 Validation Report for Head TSL

Date: 20.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

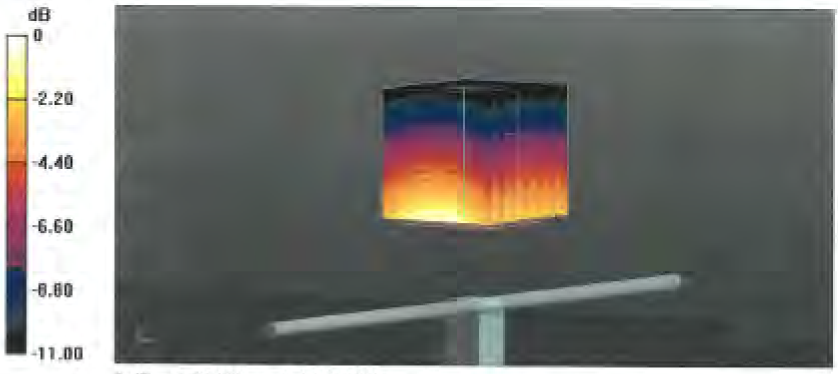
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d120

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

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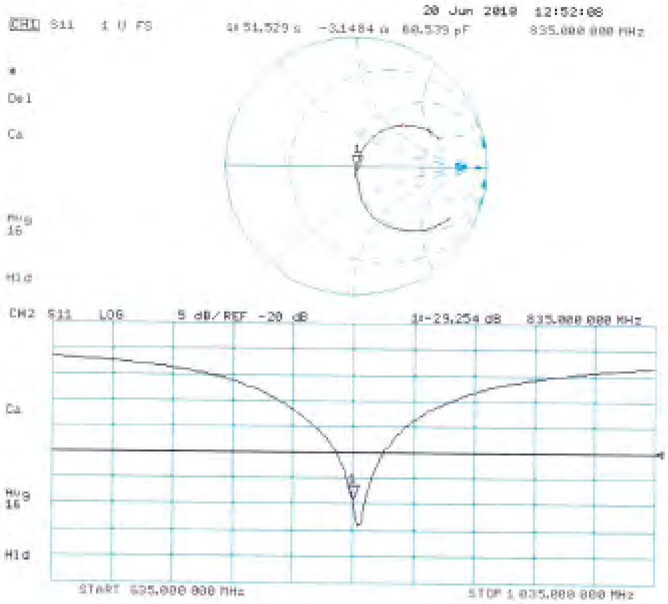
Impedance Measurement Plot for Head TSL



Certificate No: D835V2-4d120_Jun18 Page 6 of 8

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DASY5 Validation Report for Body TSL

Date: 20.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

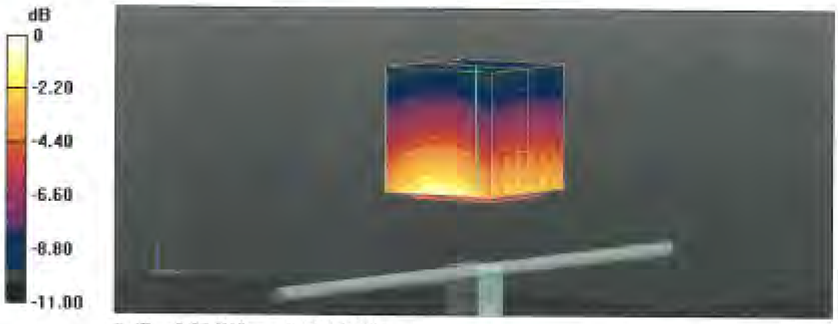
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d120

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.99$ S/m; $\varepsilon_r = 55$; $\rho = 1000$ 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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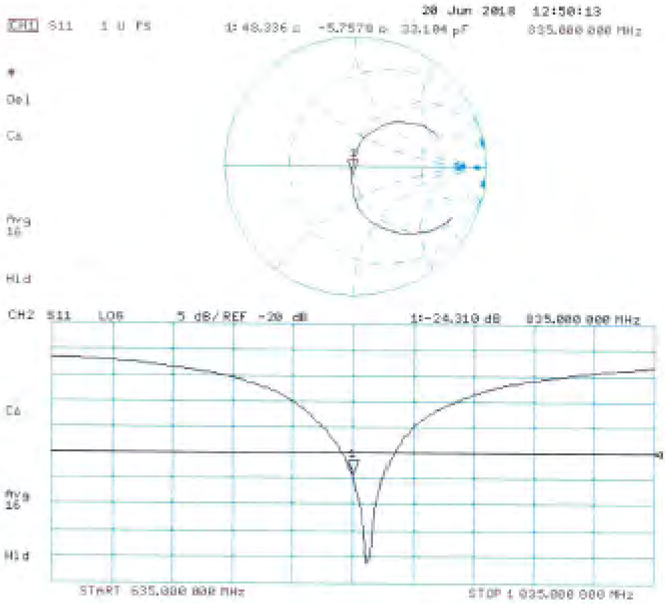
Impedance Measurement Plot for Body TSL



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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

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

Certificate No: D1750V2-1023_Jun18 Page 1 of 8

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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%.

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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 cm³ (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 cm³ (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 cm³ (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 cm³ (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

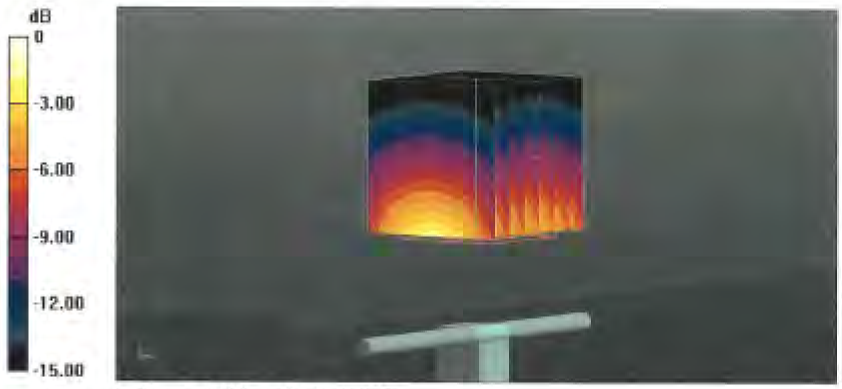
DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1023

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)

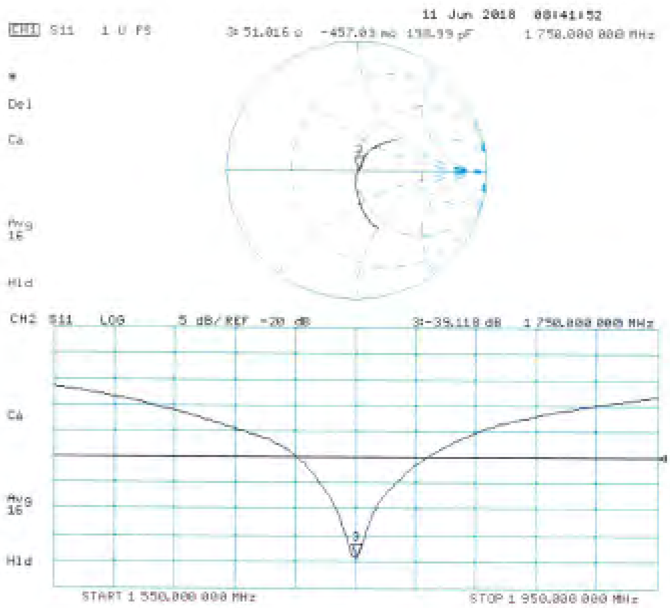
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.5 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 9.1 W/kg; SAR(10 g) = 4.82 W/kg
Maximum value of SAR (measured) = 14.0 W/kg



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

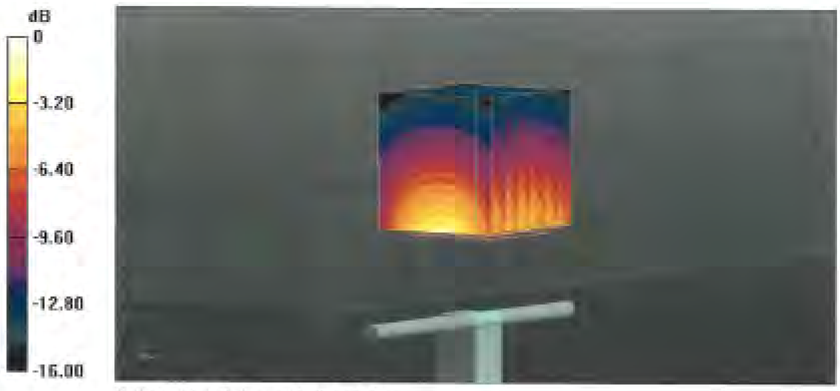
DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1023

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)

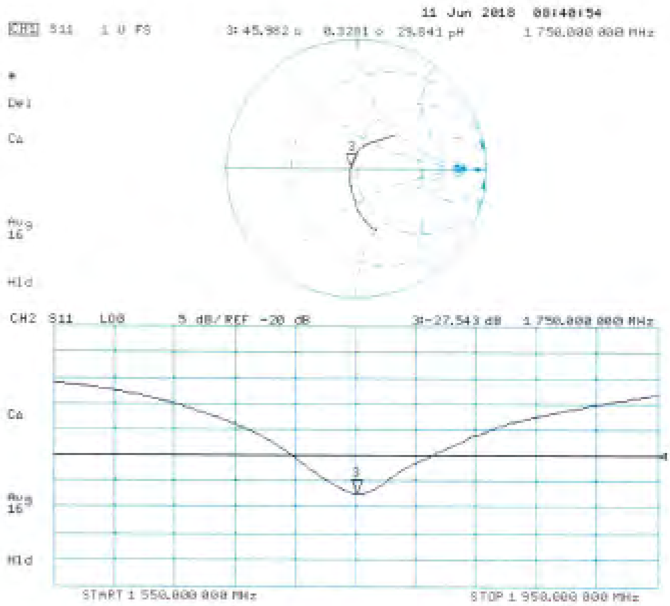
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.3 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 9.12 W/kg; SAR(10 g) = 4.9 W/kg
Maximum value of SAR (measured) = 13.5 W/kg



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

Certificate No: D1750V2-1023_Jun18 Page 7 of 8

Impedance Measurement Plot for Body TSL



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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

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Swiss Calibration Service

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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

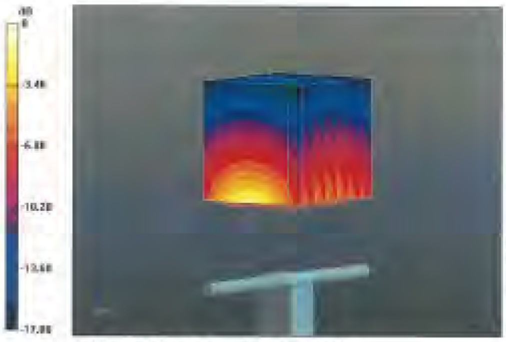
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

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

Certificate No: D1900V2-5d173_Apr18 Page 5 of 8

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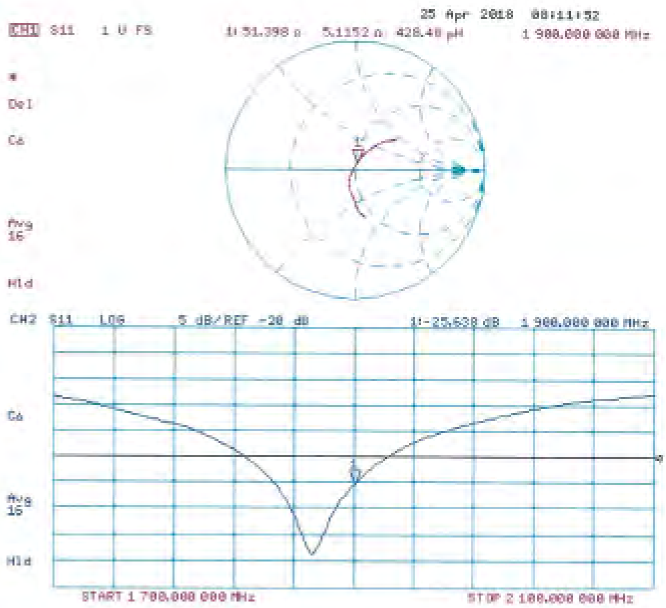
Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d173_Apr18 Page 6 of 8

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

Certificate No: D1900V2-5d173_Apr18 Page 7 of 8

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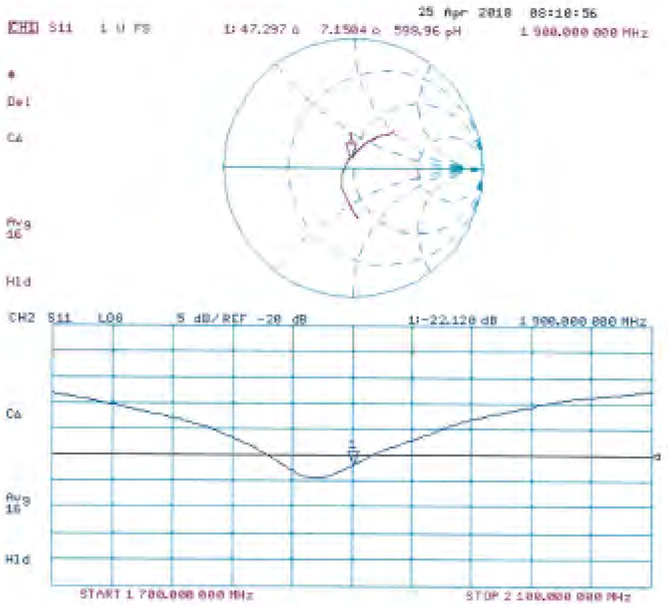
Impedance Measurement Plot for Body TSL



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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

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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

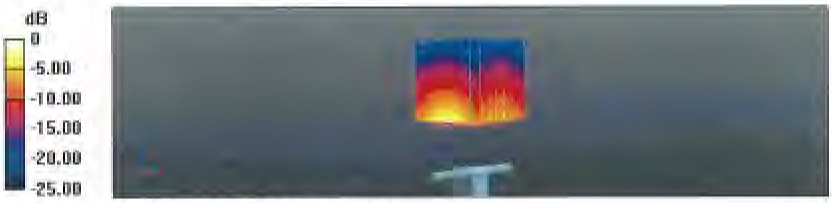
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

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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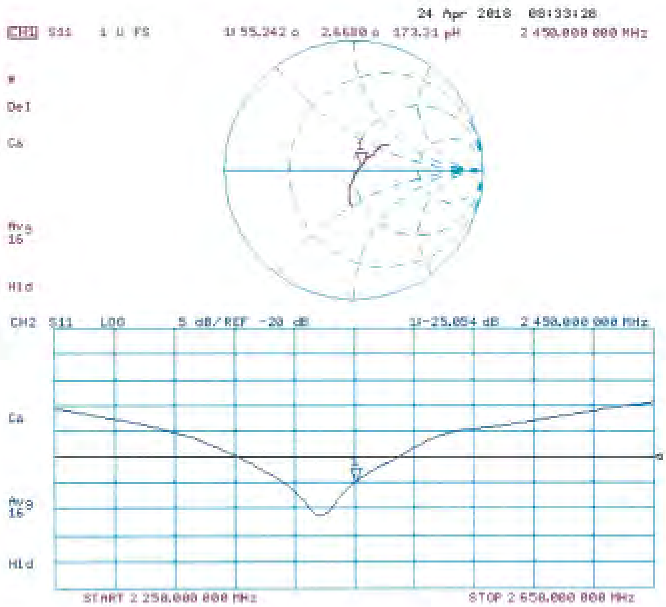
Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-727_Apr18 Page 6 of 8

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DASY5 Validation Report for Body TSL

Date: 24.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

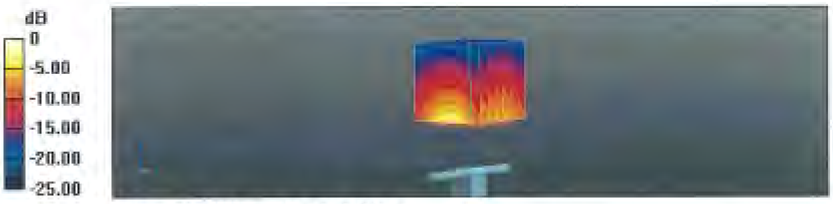
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

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:

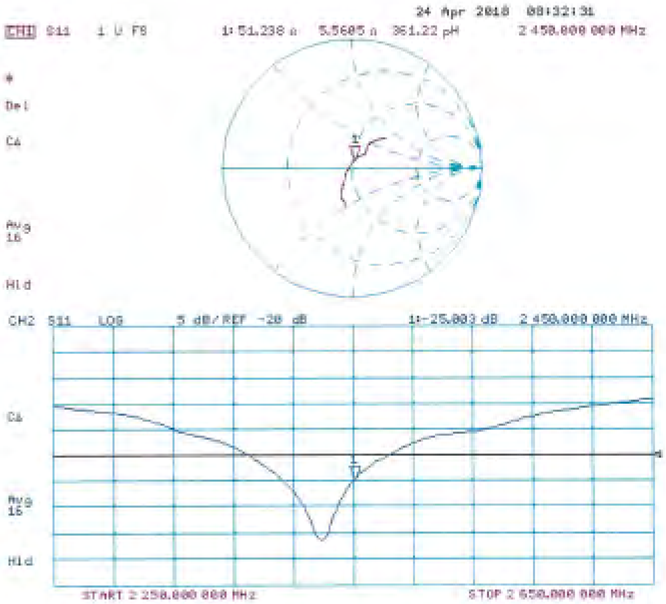
- Probe: EX3DV4 - SN7349; ConvF(8.01, 8.01, 8.01); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

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

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

Certificate No: D5GHzV2-1023_Jan18 Page 1 of 15

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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%.

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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)**

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Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.5 ± 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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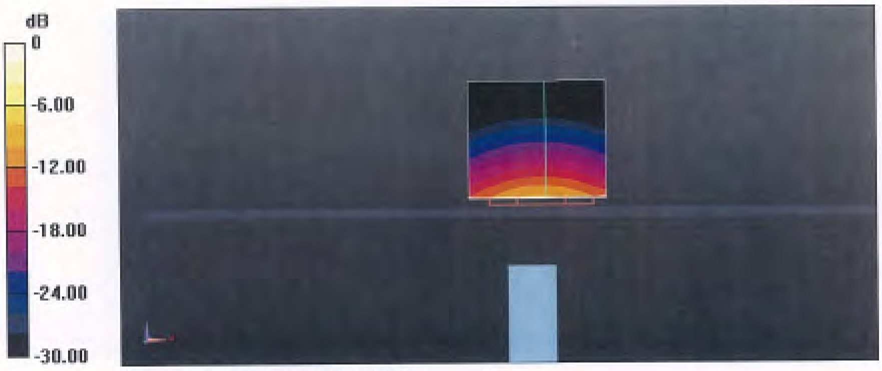
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.22 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 31.2 W/kg
SAR(1 g) = 7.9 W/kg; SAR(10 g) = 2.25 W/kg
Maximum value of SAR (measured) = 19.0 W/kg



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

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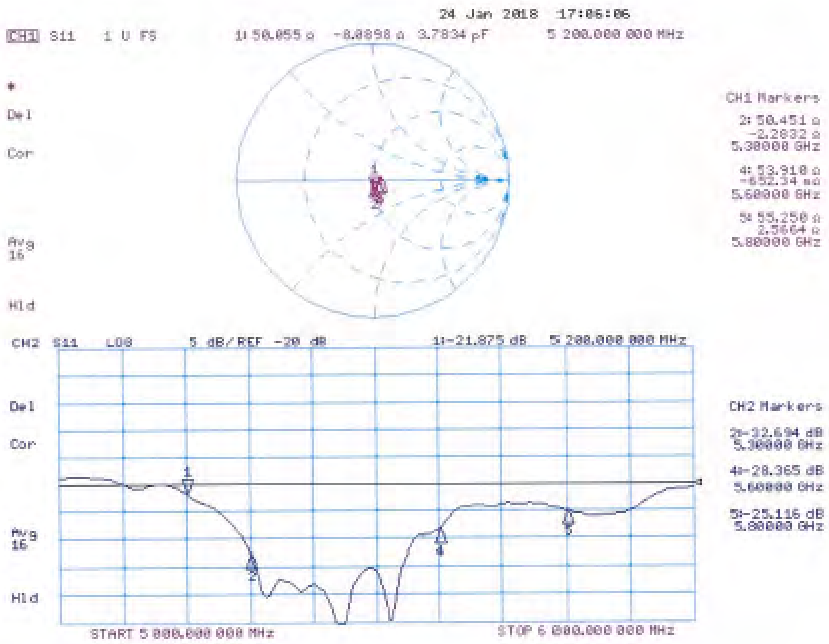
Impedance Measurement Plot for Head TSL



Certificate No: D5GHzV2-1023_Jan18 Page 12 of 15

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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

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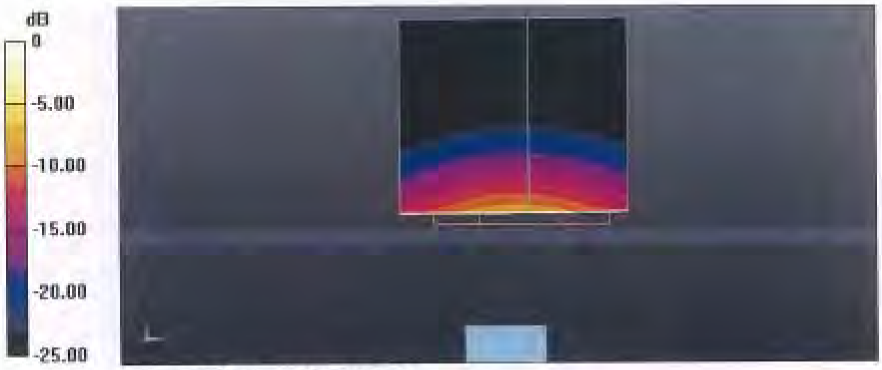
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.05 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 7.46 W/kg; SAR(10 g) = 2.07 W/kg
Maximum value of SAR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



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

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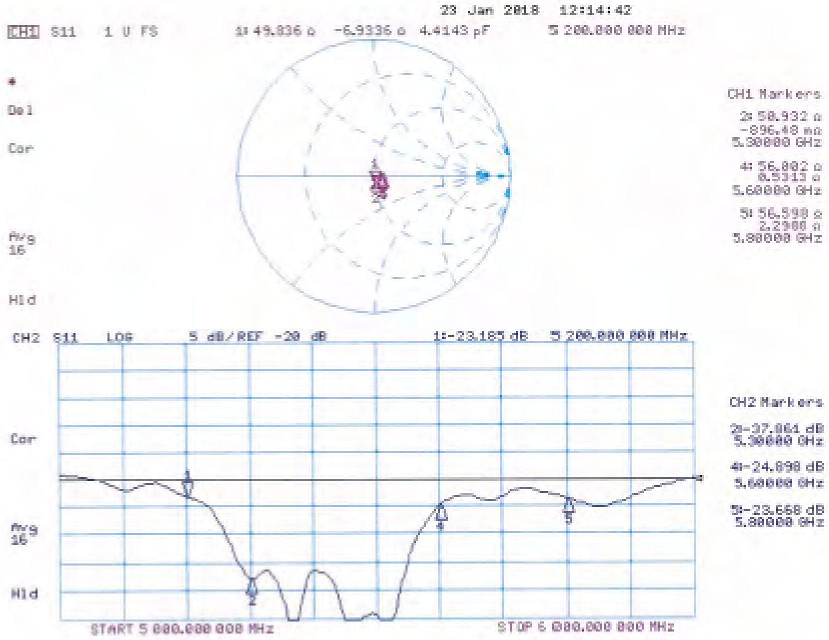
Impedance Measurement Plot for Body TSL



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- End of report -