SAR TEST REPORT

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

Equipment Under Test	Notebook PC
Brand Name	Quanta
Model No.	CTL NL7L
Company Name	Fibocom Wireless Inc.
Company Address	5/F, Tower A, Technology Building II, 1057 Nanhai Avenue, Shenzhen ,518067 China
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013, KDB616217D04v01r02,KDB865664D01v01r04, KDB865664D02v01r02,KDB941225D01v03r01, KDB941225D05v02r05,KDB941225D05Av01r02, KDB447498D01v06
FCC ID	ZMOL850GL
Date of Receipt	Sep. 12, 2018
Date of Test(s)	Sep. 17, 2018 ~ Sep. 21, 2018
Date of Issue	Nov. 30, 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	Asst. Supervisor / Afu Chen	Asst. Manager / John Yeh
Ruby Ou	afu Chen	John Yeh

Date: Nov. 30, 2018

Revision History

Report Number	Revision	Description	Issue Date
E5/2018/90009	Rev.00	Initial creation of document	Oct. 09, 2018
E5/2018/90009	Rev.01	Add pin in page 90 and modify model name.	Nov. 28, 2018
E5/2018/90009	Rev.02	Modify chapter 1.3 and chapter 2	Nov. 29, 2018
E5/2018/90009	Rev.03	Modify LTE B17 target	Nov. 30, 2018

Contents

1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Electronics & Communication Laboratory	
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Tel	+886-2-2299-3279
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Internet	http://www.tw.sgs.com/

1.2 Details of Applicant

Company Name	Fibocom Wireless Inc.
Company Address	5/F, Tower A, Technology Building II, 1057 Nanhai Avenue, Shenzhen ,518067 China

1.3 Description of EUT

Equipment Under Test	Notebook PC		
Brand Name	Quanta		
Model No.	CTL NL7L		
FCC ID	ZMOL850GL		
Integrated Module	WWAN	Brand Name : Fibocom Model Name : L850-GL	
Mode of Operation	☒WCDMA ☒HSDPA ☒HSUPA ☒HSPA+ ☒DC-HSDPA ☒LTE FDD ☒LTE TDD		
Duty Cycle	WCDMA	1	
	LTE FDD	1	
	LTE TDD	0.633	
TX Frequency Range (MHz)	WCDMA Band II	1850	– 1910
	WCDMA Band IV	1710	– 1755
	WCDMA Band V	824	– 849
	LTE FDD Band 2	1850	– 1910
	LTE FDD Band 4	1710	– 1755
	LTE FDD Band 5	824	– 849
	LTE FDD Band 7	2500	– 2570
	LTE FDD Band 12	699	– 716
	LTE FDD Band 13	777	– 787
	LTE FDD Band 17	704	– 716
	LTE FDD Band 26	814	– 849
	LTE FDD Band 30	2305	– 2315
	LTE TDD Band 38	2570	– 2620
	LTE TDD Band 41	2496	– 2690

TX Frequency Range (MHz)	LTE FDD Band 66	1710	–	1780
Channel Number (ARFCN)	WCDMA Band II	9262	–	9538
	WCDMA Band IV	1312	–	1513
	WCDMA Band V	4132	–	4233
	LTE FDD Band 2	18607	–	19193
	LTE FDD Band 4	19957	–	20393
	LTE FDD Band 5	20407	–	20643
	LTE FDD Band 7	20775	–	21425
	LTE FDD Band 12	23017	–	23173
	LTE FDD Band 13	23205	–	23255
	LTE FDD Band 17	23755	–	23825
	LTE FDD Band 26	26697	–	27033
	LTE FDD Band 30	27685	–	27735
	LTE TDD Band 38	37775	–	38225
	LTE TDD Band 41	39675	–	41565
	LTE FDD Band 66	131979	–	132665

Max. SAR (1 g) (Unit: W/Kg)				
Band	Measured	Reported	Channel	Position
WCDMA Band II	0.04	0.05	9538	Bottom side
WCDMA Band IV	0.05	0.06	1412	Bottom side
WCDMA Band V	0.02	0.02	4233	Bottom side
LTE FDD Band 2	0.04	0.04	18900	Bottom side
LTE FDD Band 4	0.05	0.06	20050	Bottom side
LTE FDD Band 5	0.02	0.02	20525	Bottom side
LTE FDD Band 7	0.05	0.06	20850	Bottom side
LTE FDD Band 12	0.04	0.05	23060	Bottom side
LTE FDD Band 13	0.03	0.04	23230	Bottom side
LTE FDD Band 17	0.04	0.04	23800	Bottom side
LTE FDD Band 26	0.02	0.02	26765	Bottom side
LTE FDD Band 30	0.05	0.07	27710	Bottom side
LTE TDD Band 38	0.03	0.04	37850	Bottom side
LTE TDD Band 41	0.04	0.05	40620	Bottom side
LTE FDD Band 66	0.05	0.06	132322	Bottom side

WCDMA Band II / Band IV / Band V - HSDPA / HSUPA / HSPA+ / DC-HSDPA conducted power table :

Unit: dBm

Band		WCDMA II		
TX Channel		9262	9400	9538
Frequency (MHz)		1852.4	1880	1907.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**24.00**		
3GPP Rel 99	RMC 12.2Kbps	23.41	23.48	23.49
3GPP Rel 5	HSDPA Subtest-1	23.38	23.46	23.42
	HSDPA Subtest-2	23.39	23.41	23.48
	HSDPA Subtest-3	22.88	22.95	22.97
	HSDPA Subtest-4	22.88	22.92	22.94
3GPP Rel 6	HSUPA Subtest-1	23.37	23.46	23.45
	HSUPA Subtest-2	21.45	21.48	21.54
	HSUPA Subtest-3	22.40	22.49	22.52
	HSUPA Subtest-4	21.43	21.44	21.51
	HSUPA Subtest-5	23.34	23.43	23.45
3GPP Rel 7	HSPA+	23.34	23.43	23.46
3GPP Rel 8	DC-HSDPA Subtest-1	23.38	23.44	23.40
	DC-HSDPA Subtest-2	23.39	23.30	23.41
	DC-HSDPA Subtest-3	22.74	22.81	22.95
	DC-HSDPA Subtest-4	22.74	22.78	22.90

Band		WCDMA IV		
TX Channel		1312	1412	1513
Frequency (MHz)		1712.4	1732.4	1752.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**24.00**		
3GPP Rel 99	RMC 12.2Kbps	23.12	23.19	23.46
3GPP Rel 5	HSDPA Subtest-1	23.10	23.17	23.43
	HSDPA Subtest-2	23.11	23.14	23.41
	HSDPA Subtest-3	22.64	22.64	22.91
	HSDPA Subtest-4	22.62	22.61	22.90
3GPP Rel 6	HSUPA Subtest-1	23.07	23.15	23.44
	HSUPA Subtest-2	21.59	21.66	21.95
	HSUPA Subtest-3	22.63	22.66	22.95
	HSUPA Subtest-4	21.53	21.64	21.92
	HSUPA Subtest-5	23.11	23.13	23.42
3GPP Rel 7	HSPA+	23.04	23.15	23.41
3GPP Rel 8	DC-HSDPA Subtest-1	23.03	23.06	23.42
	DC-HSDPA Subtest-2	23.08	23.13	23.34
	DC-HSDPA Subtest-3	22.52	22.57	22.80
	DC-HSDPA Subtest-4	22.56	22.58	22.81

Band		WCDMA V		
TX Channel		4132	4183	4233
Frequency (MHz)		826.4	836.6	846.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**24.00**		
3GPP Rel 99	RMC 12.2Kbps	23.53	23.57	23.71
3GPP Rel 5	HSDPA Subtest-1	23.42	23.45	23.63
	HSDPA Subtest-2	23.41	23.42	23.61
	HSDPA Subtest-3	22.81	22.88	23.11
	HSDPA Subtest-4	22.82	22.85	23.13
3GPP Rel 6	HSUPA Subtest-1	23.46	23.49	23.65
	HSUPA Subtest-2	21.92	22.55	22.16
	HSUPA Subtest-3	22.44	23.03	22.64
	HSUPA Subtest-4	21.92	22.55	22.16
	HSUPA Subtest-5	23.43	23.44	23.62
3GPP Rel 7	HSPA+	23.45	23.43	23.69
3GPP Rel 8	DC-HSDPA Subtest-1	23.32	23.31	23.49
	DC-HSDPA Subtest-2	23.39	23.30	23.59
	DC-HSDPA Subtest-3	22.81	22.82	22.98
	DC-HSDPA Subtest-4	22.73	22.80	23.04

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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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 7 / Band 12 / Band 13 / Band 17 / Band 26 / Band 30 / Band 66 power table:

FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	1860	18700	22.91	23	0
				1880	18900	22.97	23	0
				1900	19100	22.69	23	0
			50	1860	18700	22.96	23	0
				1880	18900	22.99	23	0
				1900	19100	22.97	23	0
			99	1860	18700	22.92	23	0
				1880	18900	22.82	23	0
				1900	19100	22.70	23	0
		50 RB	0	1860	18700	21.68	22	0-1
				1880	18900	21.95	22	0-1
				1900	19100	21.65	22	0-1
			25	1860	18700	21.69	22	0-1
				1880	18900	21.94	22	0-1
				1900	19100	21.83	22	0-1
			50	1860	18700	21.75	22	0-1
				1880	18900	21.96	22	0-1
				1900	19100	21.93	22	0-1
		100RB		1860	18700	21.91	22	0-1
				1880	18900	21.99	22	0-1
				1900	19100	21.60	22	0-1
	16-QAM	1 RB	0	1860	18700	21.70	22	0-1
				1880	18900	21.54	22	0-1
				1900	19100	21.65	22	0-1
			50	1860	18700	21.34	22	0-1
				1880	18900	21.69	22	0-1
				1900	19100	21.60	22	0-1
			99	1860	18700	21.14	22	0-1
				1880	18900	21.22	22	0-1
				1900	19100	21.99	22	0-1
		50 RB	0	1860	18700	20.75	21	0-2
				1880	18900	21.00	21	0-2
				1900	19100	20.69	21	0-2
			25	1860	18700	20.81	21	0-2
				1880	18900	20.92	21	0-2
				1900	19100	20.80	21	0-2
			50	1860	18700	20.89	21	0-2
				1880	18900	20.92	21	0-2
				1900	19100	21.00	21	0-2
		100RB		1860	18700	20.97	21	0-2
				1880	18900	20.63	21	0-2
				1900	19100	20.71	21	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	22.82	23	0
				1880	18900	22.84	23	0
				1902.5	19125	22.80	23	0
			36	1857.5	18675	22.57	23	0
				1880	18900	22.87	23	0
				1902.5	19125	22.96	23	0
			74	1857.5	18675	22.61	23	0
				1880	18900	22.72	23	0
				1902.5	19125	22.85	23	0
		36 RB	0	1857.5	18675	21.60	22	0-1
				1880	18900	21.94	22	0-1
				1902.5	19125	21.78	22	0-1
			18	1857.5	18675	21.58	22	0-1
				1880	18900	21.95	22	0-1
				1902.5	19125	21.90	22	0-1
			37	1857.5	18675	21.65	22	0-1
				1880	18900	21.83	22	0-1
				1902.5	19125	21.99	22	0-1
		75RB		1857.5	18675	21.70	22	0-1
				1880	18900	21.92	22	0-1
				1902.5	19125	22.05	22	0-1
	16-QAM	1 RB	0	1857.5	18675	22.00	22	0-1
				1880	18900	22.20	22	0-1
				1902.5	19125	22.16	22	0-1
			36	1857.5	18675	22.03	22	0-1
				1880	18900	22.28	22	0-1
				1902.5	19125	22.30	22	0-1
			74	1857.5	18675	21.78	22	0-1
				1880	18900	22.33	22	0-1
				1902.5	19125	22.51	22	0-1
		36 RB	0	1857.5	18675	20.62	21	0-2
				1880	18900	20.97	21	0-2
				1902.5	19125	20.84	21	0-2
			18	1857.5	18675	20.70	21	0-2
				1880	18900	20.99	21	0-2
				1902.5	19125	20.95	21	0-2
			37	1857.5	18675	20.69	21	0-2
				1880	18900	20.86	21	0-2
				1902.5	19125	20.98	21	0-2
		75RB		1857.5	18675	20.74	21	0-2
				1880	18900	20.94	21	0-2
				1902.5	19125	21.06	21	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)
10	QPSK	1 RB	0	1855	18650	22.66	23	0
				1880	18900	22.83	23	0
				1905	19150	22.81	23	0
			25	1855	18650	22.65	23	0
				1880	18900	23.00	23	0
				1905	19150	22.94	23	0
			49	1855	18650	22.38	23	0
				1880	18900	22.96	23	0
				1905	19150	22.86	23	0
		25 RB	0	1855	18650	21.66	22	0-1
				1880	18900	21.97	22	0-1
				1905	19150	21.92	22	0-1
			12	1855	18650	21.52	22	0-1
				1880	18900	21.94	22	0-1
				1905	19150	21.94	22	0-1
			25	1855	18650	21.53	22	0-1
				1880	18900	21.89	22	0-1
				1905	19150	21.93	22	0-1
		50RB		1855	18650	21.47	22	0-1
				1880	18900	21.96	22	0-1
				1905	19150	21.93	22	0-1
	16-QAM	1 RB	0	1855	18650	21.95	22	0-1
				1880	18900	21.71	22	0-1
				1905	19150	21.95	22	0-1
			25	1855	18650	21.69	22	0-1
				1880	18900	21.84	22	0-1
				1905	19150	21.72	22	0-1
			49	1855	18650	21.82	22	0-1
				1880	18900	21.95	22	0-1
				1905	19150	21.72	22	0-1
		25 RB	0	1855	18650	20.70	21	0-2
				1880	18900	20.98	21	0-2
				1905	19150	21.00	21	0-2
			12	1855	18650	20.75	21	0-2
				1880	18900	20.93	21	0-2
				1905	19150	21.00	21	0-2
			25	1855	18650	20.67	21	0-2
				1880	18900	20.91	21	0-2
				1905	19150	20.98	21	0-2
		50RB		1855	18650	20.66	21	0-2
				1880	18900	20.94	21	0-2
				1905	19150	21.00	21	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)
5	QPSK	1 RB	0	1852.5	18625	22.61	23	0
				1880	18900	22.82	23	0
				1907.5	19175	22.87	23	0
			12	1852.5	18625	22.53	23	0
				1880	18900	22.75	23	0
				1907.5	19175	22.88	23	0
			24	1852.5	18625	22.54	23	0
				1880	18900	22.85	23	0
				1907.5	19175	22.73	23	0
		12 RB	0	1852.5	18625	21.71	22	0-1
				1880	18900	21.90	22	0-1
				1907.5	19175	21.90	22	0-1
			6	1852.5	18625	21.70	22	0-1
				1880	18900	21.92	22	0-1
				1907.5	19175	21.88	22	0-1
			13	1852.5	18625	21.58	22	0-1
				1880	18900	21.85	22	0-1
				1907.5	19175	21.84	22	0-1
		25RB		1852.5	18625	21.62	22	0-1
				1880	18900	21.88	22	0-1
				1907.5	19175	21.81	22	0-1
	16-QAM	1 RB	0	1852.5	18625	21.99	22	0-1
				1880	18900	21.95	22	0-1
				1907.5	19175	21.89	22	0-1
			12	1852.5	18625	21.79	22	0-1
				1880	18900	21.97	22	0-1
				1907.5	19175	21.82	22	0-1
			24	1852.5	18625	21.83	22	0-1
				1880	18900	21.19	22	0-1
				1907.5	19175	21.04	22	0-1
		12 RB	0	1852.5	18625	20.83	21	0-2
				1880	18900	20.92	21	0-2
				1907.5	19175	20.81	21	0-2
			6	1852.5	18625	20.68	21	0-2
				1880	18900	20.85	21	0-2
				1907.5	19175	20.76	21	0-2
			13	1852.5	18625	20.51	21	0-2
				1880	18900	20.86	21	0-2
				1907.5	19175	20.65	21	0-2
		25RB		1852.5	18625	20.70	21	0-2
				1880	18900	20.86	21	0-2
				1907.5	19175	20.86	21	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)
3	QPSK	1 RB	0	1851.5	18615	22.62	23	0
				1880	18900	22.85	23	0
				1908.5	19185	22.79	23	0
			7	1851.5	18615	22.61	23	0
				1880	18900	22.77	23	0
				1908.5	19185	22.78	23	0
			14	1851.5	18615	22.51	23	0
				1880	18900	22.70	23	0
				1908.5	19185	22.69	23	0
		8 RB	0	1851.5	18615	21.68	22	0-1
				1880	18900	21.81	22	0-1
				1908.5	19185	21.70	22	0-1
			4	1851.5	18615	21.60	22	0-1
				1880	18900	21.78	22	0-1
				1908.5	19185	21.62	22	0-1
			7	1851.5	18615	21.62	22	0-1
				1880	18900	21.81	22	0-1
				1908.5	19185	21.60	22	0-1
		15RB		1851.5	18615	21.62	22	0-1
				1880	18900	21.81	22	0-1
				1908.5	19185	21.62	22	0-1
	16-QAM	1 RB	0	1851.5	18615	21.84	22	0-1
				1880	18900	21.81	22	0-1
				1908.5	19185	21.72	22	0-1
			7	1851.5	18615	21.70	22	0-1
				1880	18900	21.75	22	0-1
				1908.5	19185	21.74	22	0-1
			14	1851.5	18615	21.48	22	0-1
				1880	18900	21.85	22	0-1
				1908.5	19185	21.90	22	0-1
		8 RB	0	1851.5	18615	20.70	21	0-2
				1880	18900	20.72	21	0-2
				1908.5	19185	20.77	21	0-2
			4	1851.5	18615	20.73	21	0-2
				1880	18900	20.74	21	0-2
				1908.5	19185	20.64	21	0-2
			7	1851.5	18615	20.80	21	0-2
				1880	18900	20.94	21	0-2
				1908.5	19185	20.72	21	0-2
		15RB		1851.5	18615	20.57	21	0-2
				1880	18900	20.78	21	0-2
				1908.5	19185	20.65	21	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	22.71	23	0
				1880	18900	22.99	23	0
				1909.3	19193	22.72	23	0
			2	1850.7	18607	22.61	23	0
				1880	18900	22.87	23	0
				1909.3	19193	22.80	23	0
			5	1850.7	18607	22.65	23	0
				1880	18900	22.94	23	0
				1909.3	19193	22.72	23	0
		3 RB	0	1850.7	18607	22.72	23	0
				1880	18900	22.81	23	0
				1909.3	19193	22.62	23	0
			2	1850.7	18607	22.67	23	0
				1880	18900	22.83	23	0
				1909.3	19193	22.59	23	0
			3	1850.7	18607	22.66	23	0
				1880	18900	22.86	23	0
				1909.3	19193	22.66	23	0
		6RB		1850.7	18607	21.66	22	0-1
				1880	18900	21.81	22	0-1
				1909.3	19193	21.60	22	0-1
	16-QAM	1 RB	0	1850.7	18607	21.73	22	0-1
				1880	18900	21.77	22	0-1
				1909.3	19193	21.53	22	0-1
			2	1850.7	18607	21.58	22	0-1
				1880	18900	21.52	22	0-1
				1909.3	19193	21.41	22	0-1
			5	1850.7	18607	21.68	22	0-1
				1880	18900	21.53	22	0-1
				1909.3	19193	21.51	22	0-1
		3 RB	0	1850.7	18607	21.51	22	0-1
				1880	18900	21.58	22	0-1
				1909.3	19193	21.88	22	0-1
			2	1850.7	18607	21.61	22	0-1
				1880	18900	22.00	22	0-1
				1909.3	19193	21.68	22	0-1
			3	1850.7	18607	21.81	22	0-1
				1880	18900	21.66	22	0-1
				1909.3	19193	21.69	22	0-1
		6RB		1850.7	18607	20.61	21	0-2
				1880	18900	20.72	21	0-2
				1909.3	19193	20.78	21	0-2

FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	1720	20050	22.81	23.5	0
				1732.5	20175	22.69	23.5	0
				1745	20300	22.60	23.5	0
			50	1720	20050	22.82	23.5	0
				1732.5	20175	22.75	23.5	0
				1745	20300	22.89	23.5	0
			99	1720	20050	22.66	23.5	0
				1732.5	20175	22.71	23.5	0
				1745	20300	22.70	23.5	0
		50 RB	0	1720	20050	21.88	22.5	0-1
				1732.5	20175	21.60	22.5	0-1
				1745	20300	21.97	22.5	0-1
			25	1720	20050	21.84	22.5	0-1
				1732.5	20175	21.59	22.5	0-1
				1745	20300	21.77	22.5	0-1
			50	1720	20050	21.71	22.5	0-1
				1732.5	20175	21.58	22.5	0-1
				1745	20300	21.93	22.5	0-1
		100RB		1720	20050	21.94	22.5	0-1
				1732.5	20175	21.73	22.5	0-1
				1745	20300	21.95	22.5	0-1
	16-QAM	1 RB	0	1720	20050	21.80	22.5	0-1
				1732.5	20175	22.37	22.5	0-1
				1745	20300	21.76	22.5	0-1
			50	1720	20050	22.08	22.5	0-1
				1732.5	20175	21.94	22.5	0-1
				1745	20300	21.85	22.5	0-1
			99	1720	20050	21.61	22.5	0-1
				1732.5	20175	21.73	22.5	0-1
				1745	20300	21.58	22.5	0-1
		50 RB	0	1720	20050	20.92	21.5	0-2
				1732.5	20175	20.66	21.5	0-2
				1745	20300	20.75	21.5	0-2
			25	1720	20050	20.92	21.5	0-2
				1732.5	20175	20.63	21.5	0-2
				1745	20300	20.80	21.5	0-2
			50	1720	20050	20.75	21.5	0-2
				1732.5	20175	20.63	21.5	0-2
				1745	20300	20.99	21.5	0-2
		100RB		1720	20050	20.99	21.5	0-2
				1732.5	20175	20.75	21.5	0-2
				1745	20300	20.91	21.5	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)
15	QPSK	1 RB	0	1717.5	20025	22.75	23.5	0
				1732.5	20175	22.89	23.5	0
				1747.5	20325	22.62	23.5	0
			36	1717.5	20025	22.69	23.5	0
				1732.5	20175	22.44	23.5	0
				1747.5	20325	22.92	23.5	0
			74	1717.5	20025	22.67	23.5	0
				1732.5	20175	22.55	23.5	0
				1747.5	20325	22.89	23.5	0
		36 RB	0	1717.5	20025	21.79	22.5	0-1
				1732.5	20175	21.57	22.5	0-1
				1747.5	20325	21.73	22.5	0-1
			18	1717.5	20025	21.87	22.5	0-1
				1732.5	20175	21.54	22.5	0-1
				1747.5	20325	21.80	22.5	0-1
			37	1717.5	20025	21.85	22.5	0-1
				1732.5	20175	21.58	22.5	0-1
				1747.5	20325	21.95	22.5	0-1
		75RB		1717.5	20025	21.87	22.5	0-1
				1732.5	20175	21.64	22.5	0-1
				1747.5	20325	21.87	22.5	0-1
	16-QAM	1 RB	0	1717.5	20025	21.96	22.5	0-1
				1732.5	20175	22.26	22.5	0-1
				1747.5	20325	21.28	22.5	0-1
			36	1717.5	20025	21.92	22.5	0-1
				1732.5	20175	21.52	22.5	0-1
				1747.5	20325	21.97	22.5	0-1
			74	1717.5	20025	22.35	22.5	0-1
				1732.5	20175	22.22	22.5	0-1
				1747.5	20325	22.41	22.5	0-1
		36 RB	0	1717.5	20025	20.85	21.5	0-2
				1732.5	20175	20.58	21.5	0-2
				1747.5	20325	20.82	21.5	0-2
			18	1717.5	20025	21.01	21.5	0-2
				1732.5	20175	20.60	21.5	0-2
				1747.5	20325	20.86	21.5	0-2
			37	1717.5	20025	20.92	21.5	0-2
				1732.5	20175	20.58	21.5	0-2
				1747.5	20325	21.03	21.5	0-2
		75RB		1717.5	20025	21.03	21.5	0-2
				1732.5	20175	20.66	21.5	0-2
				1747.5	20325	20.90	21.5	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)
10	QPSK	1 RB	0	1715	20000	22.85	23.5	0
				1732.5	20175	22.72	23.5	0
				1750	20350	22.66	23.5	0
			25	1715	20000	22.86	23.5	0
				1732.5	20175	22.73	23.5	0
				1750	20350	23.02	23.5	0
			49	1715	20000	22.91	23.5	0
				1732.5	20175	22.50	23.5	0
				1750	20350	22.93	23.5	0
		25 RB	0	1715	20000	21.81	22.5	0-1
				1732.5	20175	21.59	22.5	0-1
				1750	20350	21.90	22.5	0-1
			12	1715	20000	21.85	22.5	0-1
				1732.5	20175	21.55	22.5	0-1
				1750	20350	21.93	22.5	0-1
			25	1715	20000	21.92	22.5	0-1
				1732.5	20175	21.58	22.5	0-1
				1750	20350	21.92	22.5	0-1
		50RB		1715	20000	21.84	22.5	0-1
				1732.5	20175	21.57	22.5	0-1
				1750	20350	21.92	22.5	0-1
	16-QAM	1 RB	0	1715	20000	22.03	22.5	0-1
				1732.5	20175	21.85	22.5	0-1
				1750	20350	22.10	22.5	0-1
			25	1715	20000	21.54	22.5	0-1
				1732.5	20175	21.72	22.5	0-1
				1750	20350	22.28	22.5	0-1
			49	1715	20000	22.26	22.5	0-1
				1732.5	20175	21.80	22.5	0-1
				1750	20350	22.27	22.5	0-1
		25 RB	0	1715	20000	20.84	21.5	0-2
				1732.5	20175	20.68	21.5	0-2
				1750	20350	20.99	21.5	0-2
			12	1715	20000	20.87	21.5	0-2
				1732.5	20175	20.62	21.5	0-2
				1750	20350	21.06	21.5	0-2
			25	1715	20000	20.95	21.5	0-2
				1732.5	20175	20.64	21.5	0-2
				1750	20350	21.01	21.5	0-2
		50RB		1715	20000	20.93	21.5	0-2
				1732.5	20175	20.55	21.5	0-2
				1750	20350	21.03	21.5	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)
5	QPSK	1 RB	0	1712.5	19975	22.57	23.5	0
				1732.5	20175	22.59	23.5	0
				1752.5	20375	22.96	23.5	0
			12	1712.5	19975	22.77	23.5	0
				1732.5	20175	22.61	23.5	0
				1752.5	20375	22.81	23.5	0
			24	1712.5	19975	22.76	23.5	0
				1732.5	20175	22.54	23.5	0
				1752.5	20375	22.83	23.5	0
		12 RB	0	1712.5	19975	22.19	22.5	0-1
				1732.5	20175	22.01	22.5	0-1
				1752.5	20375	22.39	22.5	0-1
			6	1712.5	19975	22.22	22.5	0-1
				1732.5	20175	22.46	22.5	0-1
				1752.5	20375	22.39	22.5	0-1
			13	1712.5	19975	22.27	22.5	0-1
				1732.5	20175	22.03	22.5	0-1
				1752.5	20375	22.37	22.5	0-1
		25RB		1712.5	19975	21.72	22.5	0-1
				1732.5	20175	21.52	22.5	0-1
				1752.5	20375	21.90	22.5	0-1
	16-QAM	1 RB	0	1712.5	19975	21.47	22.5	0-1
				1732.5	20175	21.93	22.5	0-1
				1752.5	20375	22.28	22.5	0-1
			12	1712.5	19975	21.76	22.5	0-1
				1732.5	20175	21.65	22.5	0-1
				1752.5	20375	22.10	22.5	0-1
			24	1712.5	19975	21.75	22.5	0-1
				1732.5	20175	21.78	22.5	0-1
				1752.5	20375	22.10	22.5	0-1
		12 RB	0	1712.5	19975	21.19	21.5	0-2
				1732.5	20175	21.15	21.5	0-2
				1752.5	20375	21.42	21.5	0-2
			6	1712.5	19975	21.42	21.5	0-2
				1732.5	20175	21.04	21.5	0-2
				1752.5	20375	21.49	21.5	0-2
			13	1712.5	19975	21.48	21.5	0-2
				1732.5	20175	21.12	21.5	0-2
				1752.5	20375	21.38	21.5	0-2
		25RB		1712.5	19975	20.66	21.5	0-2
				1732.5	20175	20.58	21.5	0-2
				1752.5	20375	20.88	21.5	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	22.61	23.5	0
				1732.5	20175	22.46	23.5	0
				1753.5	20385	22.78	23.5	0
			7	1711.5	19965	22.72	23.5	0
				1732.5	20175	22.58	23.5	0
				1753.5	20385	22.67	23.5	0
			14	1711.5	19965	22.70	23.5	0
				1732.5	20175	22.45	23.5	0
				1753.5	20385	22.72	23.5	0
		8 RB	0	1711.5	19965	21.64	22.5	0-1
				1732.5	20175	21.44	22.5	0-1
				1753.5	20385	21.83	22.5	0-1
			4	1711.5	19965	21.64	22.5	0-1
				1732.5	20175	21.50	22.5	0-1
				1753.5	20385	21.78	22.5	0-1
			7	1711.5	19965	21.68	22.5	0-1
				1732.5	20175	21.47	22.5	0-1
				1753.5	20385	21.82	22.5	0-1
		15RB		1711.5	19965	21.64	22.5	0-1
				1732.5	20175	21.52	22.5	0-1
				1753.5	20385	21.81	22.5	0-1
	16-QAM	1 RB	0	1711.5	19965	22.16	22.5	0-1
				1732.5	20175	21.66	22.5	0-1
				1753.5	20385	21.85	22.5	0-1
			7	1711.5	19965	22.15	22.5	0-1
				1732.5	20175	22.15	22.5	0-1
				1753.5	20385	22.43	22.5	0-1
			14	1711.5	19965	21.74	22.5	0-1
				1732.5	20175	21.53	22.5	0-1
				1753.5	20385	22.09	22.5	0-1
		8 RB	0	1711.5	19965	20.74	21.5	0-2
				1732.5	20175	20.57	21.5	0-2
				1753.5	20385	20.88	21.5	0-2
			4	1711.5	19965	20.69	21.5	0-2
				1732.5	20175	20.57	21.5	0-2
				1753.5	20385	20.66	21.5	0-2
			7	1711.5	19965	20.74	21.5	0-2
				1732.5	20175	20.42	21.5	0-2
				1753.5	20385	20.93	21.5	0-2
		15RB		1711.5	19965	20.67	21.5	0-2
				1732.5	20175	20.53	21.5	0-2
				1753.5	20385	20.73	21.5	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)
1.4	QPSK	1 RB	0	1710.7	19957	22.70	23.5	0
				1732.5	20175	22.52	23.5	0
				1754.3	20393	22.74	23.5	0
			2	1710.7	19957	22.69	23.5	0
				1732.5	20175	22.47	23.5	0
				1754.3	20393	22.81	23.5	0
			5	1710.7	19957	22.67	23.5	0
				1732.5	20175	22.53	23.5	0
				1754.3	20393	22.75	23.5	0
		3 RB	0	1710.7	19957	22.62	23.5	0
				1732.5	20175	22.46	23.5	0
				1754.3	20393	22.80	23.5	0
			2	1710.7	19957	22.61	23.5	0
				1732.5	20175	22.53	23.5	0
				1754.3	20393	22.85	23.5	0
			3	1710.7	19957	22.66	23.5	0
				1732.5	20175	22.47	23.5	0
				1754.3	20393	22.83	23.5	0
		6RB		1710.7	19957	21.65	22.5	0-1
				1732.5	20175	21.49	22.5	0-1
				1754.3	20393	21.82	22.5	0-1
	16-QAM	1 RB	0	1710.7	19957	22.19	22.5	0-1
				1732.5	20175	21.57	22.5	0-1
				1754.3	20393	22.47	22.5	0-1
			2	1710.7	19957	22.08	22.5	0-1
				1732.5	20175	21.56	22.5	0-1
				1754.3	20393	21.98	22.5	0-1
			5	1710.7	19957	21.81	22.5	0-1
				1732.5	20175	22.10	22.5	0-1
				1754.3	20393	22.02	22.5	0-1
		3 RB	0	1710.7	19957	21.77	22.5	0-1
				1732.5	20175	21.42	22.5	0-1
				1754.3	20393	21.83	22.5	0-1
			2	1710.7	19957	21.67	22.5	0-1
				1732.5	20175	21.71	22.5	0-1
				1754.3	20393	21.82	22.5	0-1
			3	1710.7	19957	21.78	22.5	0-1
				1732.5	20175	21.47	22.5	0-1
				1754.3	20393	21.87	22.5	0-1
		6RB		1710.7	19957	20.68	21.5	0-2
				1732.5	20175	20.76	21.5	0-2
				1754.3	20393	20.88	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)
10	QPSK	1 RB	0	829	20450	22.77	23	0
				836.5	20525	22.91	23	0
				844	20600	22.79	23	0
			25	829	20450	22.82	23	0
				836.5	20525	22.98	23	0
				844	20600	22.95	23	0
			49	829	20450	22.77	23	0
				836.5	20525	22.93	23	0
				844	20600	22.91	23	0
		25 RB	0	829	20450	21.81	22	0-1
				836.5	20525	21.84	22	0-1
				844	20600	21.84	22	0-1
			12	829	20450	21.81	22	0-1
				836.5	20525	21.86	22	0-1
				844	20600	21.98	22	0-1
			25	829	20450	21.90	22	0-1
				836.5	20525	21.77	22	0-1
				844	20600	21.91	22	0-1
		50RB		829	20450	21.83	22	0-1
				836.5	20525	21.96	22	0-1
				844	20600	21.91	22	0-1
	16-QAM	1 RB	0	829	20450	21.92	22	0-1
				836.5	20525	21.90	22	0-1
				844	20600	21.71	22	0-1
			25	829	20450	21.72	22	0-1
				836.5	20525	21.70	22	0-1
				844	20600	21.64	22	0-1
			49	829	20450	21.64	22	0-1
				836.5	20525	21.82	22	0-1
				844	20600	21.93	22	0-1
		25 RB	0	829	20450	20.76	21	0-2
				836.5	20525	20.97	21	0-2
				844	20600	20.80	21	0-2
			12	829	20450	20.91	21	0-2
				836.5	20525	21.00	21	0-2
				844	20600	20.87	21	0-2
			25	829	20450	20.98	21	0-2
				836.5	20525	20.93	21	0-2
				844	20600	20.92	21	0-2
		500RB		829	20450	20.85	21	0-2
				836.5	20525	20.91	21	0-2
				844	20600	20.65	21	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)
5	QPSK	1 RB	0	826.5	20425	22.88	23	0
				836.5	20525	22.90	23	0
				846.5	20625	22.86	23	0
			12	826.5	20425	22.79	23	0
				836.5	20525	22.87	23	0
				846.5	20625	22.78	23	0
			24	826.5	20425	22.82	23	0
				836.5	20525	22.82	23	0
				846.5	20625	22.88	23	0
		12 RB	0	826.5	20425	21.72	22	0-1
				836.5	20525	21.81	22	0-1
				846.5	20625	21.77	22	0-1
			6	826.5	20425	21.70	22	0-1
				836.5	20525	21.85	22	0-1
				846.5	20625	21.79	22	0-1
			13	826.5	20425	21.89	22	0-1
				836.5	20525	21.80	22	0-1
				846.5	20625	21.77	22	0-1
		25RB		826.5	20425	21.71	22	0-1
				836.5	20525	21.85	22	0-1
				846.5	20625	21.87	22	0-1
	16-QAM	1 RB	0	826.5	20425	21.84	22	0-1
				836.5	20525	21.66	22	0-1
				846.5	20625	21.52	22	0-1
			12	826.5	20425	21.94	22	0-1
				836.5	20525	21.56	22	0-1
				846.5	20625	21.64	22	0-1
			24	826.5	20425	21.71	22	0-1
				836.5	20525	21.52	22	0-1
				846.5	20625	21.92	22	0-1
		12 RB	0	826.5	20425	20.78	21	0-2
				836.5	20525	20.92	21	0-2
				846.5	20625	20.83	21	0-2
			6	826.5	20425	20.73	21	0-2
				836.5	20525	20.95	21	0-2
				846.5	20625	20.77	21	0-2
			13	826.5	20425	20.82	21	0-2
				836.5	20525	20.89	21	0-2
				846.5	20625	20.75	21	0-2
		25RB		826.5	20425	20.88	21	0-2
				836.5	20525	20.92	21	0-2
				846.5	20625	20.93	21	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	22.79	23	0
				836.5	20525	22.80	23	0
				847.5	20635	22.73	23	0
			7	825.5	20415	22.82	23	0
				836.5	20525	22.82	23	0
				847.5	20635	22.72	23	0
			14	825.5	20415	22.70	23	0
				836.5	20525	22.78	23	0
				847.5	20635	22.74	23	0
		8 RB	0	825.5	20415	21.87	22	0-1
				836.5	20525	21.80	22	0-1
				847.5	20635	21.85	22	0-1
			4	825.5	20415	21.71	22	0-1
				836.5	20525	21.79	22	0-1
				847.5	20635	21.73	22	0-1
			7	825.5	20415	21.72	22	0-1
				836.5	20525	21.76	22	0-1
				847.5	20635	21.88	22	0-1
		15RB		825.5	20415	21.84	22	0-1
				836.5	20525	21.78	22	0-1
				847.5	20635	21.89	22	0-1
	16-QAM	1 RB	0	825.5	20415	21.78	22	0-1
				836.5	20525	21.36	22	0-1
				847.5	20635	21.88	22	0-1
			7	825.5	20415	21.04	22	0-1
				836.5	20525	21.65	22	0-1
				847.5	20635	21.48	22	0-1
			14	825.5	20415	21.73	22	0-1
				836.5	20525	21.98	22	0-1
				847.5	20635	21.63	22	0-1
		8 RB	0	825.5	20415	20.86	21	0-2
				836.5	20525	20.91	21	0-2
				847.5	20635	20.76	21	0-2
			4	825.5	20415	20.75	21	0-2
				836.5	20525	20.98	21	0-2
				847.5	20635	20.82	21	0-2
			7	825.5	20415	20.77	21	0-2
				836.5	20525	20.80	21	0-2
				847.5	20635	20.91	21	0-2
		15RB		825.5	20415	20.81	21	0-2
				836.5	20525	20.92	21	0-2
				847.5	20635	20.78	21	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	22.81	23	0
				836.5	20525	22.72	23	0
				848.3	20643	22.80	23	0
			2	824.7	20407	22.73	23	0
				836.5	20525	22.85	23	0
				848.3	20643	22.74	23	0
			5	824.7	20407	22.78	23	0
				836.5	20525	22.80	23	0
				848.3	20643	22.76	23	0
		3 RB	0	824.7	20407	22.74	23	0
				836.5	20525	22.82	23	0
				848.3	20643	22.86	23	0
			2	824.7	20407	22.76	23	0
				836.5	20525	22.75	23	0
				848.3	20643	22.79	23	0
			3	824.7	20407	22.71	23	0
				836.5	20525	22.79	23	0
				848.3	20643	22.74	23	0
		6RB		824.7	20407	21.76	22	0-1
				836.5	20525	21.79	22	0-1
				848.3	20643	21.83	22	0-1
	16-QAM	1 RB	0	824.7	20407	21.86	22	0-1
				836.5	20525	21.86	22	0-1
				848.3	20643	21.72	22	0-1
			2	824.7	20407	21.76	22	0-1
				836.5	20525	21.94	22	0-1
				848.3	20643	21.76	22	0-1
			5	824.7	20407	21.66	22	0-1
				836.5	20525	21.88	22	0-1
				848.3	20643	21.68	22	0-1
		3 RB	0	824.7	20407	21.78	22	0-1
				836.5	20525	21.84	22	0-1
				848.3	20643	21.89	22	0-1
			2	824.7	20407	21.76	22	0-1
				836.5	20525	21.98	22	0-1
				848.3	20643	21.73	22	0-1
			3	824.7	20407	21.84	22	0-1
				836.5	20525	21.81	22	0-1
				848.3	20643	21.85	22	0-1
		6RB		824.7	20407	20.73	21	0-2
				836.5	20525	20.91	21	0-2
				848.3	20643	20.90	21	0-2

FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	2510	20850	22.16	23.5	0
				2535	21100	22.33	23.5	0
				2560	21350	22.32	23.5	0
			50	2510	20850	22.15	23.5	0
				2535	21100	22.37	23.5	0
				2560	21350	22.13	23.5	0
			99	2510	20850	22.52	23.5	0
				2535	21100	22.61	23.5	0
				2560	21350	22.47	23.5	0
		50 RB	0	2510	20850	21.15	22.5	0-1
				2535	21100	21.38	22.5	0-1
				2560	21350	21.34	22.5	0-1
			25	2510	20850	21.21	22.5	0-1
				2535	21100	21.51	22.5	0-1
				2560	21350	21.22	22.5	0-1
			50	2510	20850	21.40	22.5	0-1
				2535	21100	21.52	22.5	0-1
				2560	21350	21.40	22.5	0-1
		100RB		2510	20850	21.30	22.5	0-1
				2535	21100	21.61	22.5	0-1
				2560	21350	21.40	22.5	0-1
	16-QAM	1 RB	0	2510	20850	21.72	22.5	0-1
				2535	21100	21.42	22.5	0-1
				2560	21350	21.54	22.5	0-1
			50	2510	20850	21.44	22.5	0-1
				2535	21100	21.88	22.5	0-1
				2560	21350	21.60	22.5	0-1
			99	2510	20850	21.98	22.5	0-1
				2535	21100	21.89	22.5	0-1
				2560	21350	21.13	22.5	0-1
		50 RB	0	2510	20850	20.21	21.5	0-2
				2535	21100	20.39	21.5	0-2
				2560	21350	20.36	21.5	0-2
			25	2510	20850	20.26	21.5	0-2
				2535	21100	20.47	21.5	0-2
				2560	21350	20.34	21.5	0-2
			50	2510	20850	20.33	21.5	0-2
				2535	21100	20.51	21.5	0-2
				2560	21350	20.41	21.5	0-2
		100RB		2510	20850	20.36	21.5	0-2
				2535	21100	20.59	21.5	0-2
				2560	21350	20.39	21.5	0-2

FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	2507.5	20825	22.12	23.5	0
				2535	21100	22.14	23.5	0
				2562.5	21375	22.34	23.5	0
			36	2507.5	20825	22.05	23.5	0
				2535	21100	22.39	23.5	0
				2562.5	21375	22.08	23.5	0
			74	2507.5	20825	22.26	23.5	0
				2535	21100	22.34	23.5	0
				2562.5	21375	22.21	23.5	0
		36 RB	0	2507.5	20825	21.12	22.5	0-1
				2535	21100	21.30	22.5	0-1
				2562.5	21375	21.20	22.5	0-1
			18	2507.5	20825	21.16	22.5	0-1
				2535	21100	21.38	22.5	0-1
				2562.5	21375	21.27	22.5	0-1
			37	2507.5	20825	21.24	22.5	0-1
				2535	21100	21.42	22.5	0-1
				2562.5	21375	21.35	22.5	0-1
		75RB		2507.5	20825	21.17	22.5	0-1
				2535	21100	21.47	22.5	0-1
				2562.5	21375	21.34	22.5	0-1
	16-QAM	1 RB	0	2507.5	20825	21.34	22.5	0-1
				2535	21100	21.01	22.5	0-1
				2562.5	21375	21.17	22.5	0-1
			36	2507.5	20825	21.01	22.5	0-1
				2535	21100	21.75	22.5	0-1
				2562.5	21375	21.34	22.5	0-1
			74	2507.5	20825	21.38	22.5	0-1
				2535	21100	21.96	22.5	0-1
				2562.5	21375	21.44	22.5	0-1
		36 RB	0	2507.5	20825	20.19	21.5	0-2
				2535	21100	20.32	21.5	0-2
				2562.5	21375	20.28	21.5	0-2
			18	2507.5	20825	20.23	21.5	0-2
				2535	21100	20.56	21.5	0-2
				2562.5	21375	20.32	21.5	0-2
			37	2507.5	20825	20.25	21.5	0-2
				2535	21100	20.56	21.5	0-2
				2562.5	21375	20.48	21.5	0-2
		75RB		2507.5	20825	20.21	21.5	0-2
				2535	21100	20.54	21.5	0-2
				2562.5	21375	20.28	21.5	0-2

FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	2505	20800	22.15	23.5	0
				2535	21100	22.21	23.5	0
				2565	21400	22.12	23.5	0
			25	2505	20800	22.06	23.5	0
				2535	21100	22.26	23.5	0
				2565	21400	22.28	23.5	0
			49	2505	20800	22.17	23.5	0
				2535	21100	22.34	23.5	0
				2565	21400	22.24	23.5	0
		25 RB	0	2505	20800	21.18	22.5	0-1
				2535	21100	21.44	22.5	0-1
				2565	21400	21.21	22.5	0-1
			12	2505	20800	21.19	22.5	0-1
				2535	21100	21.43	22.5	0-1
				2565	21400	21.31	22.5	0-1
			25	2505	20800	21.21	22.5	0-1
				2535	21100	21.48	22.5	0-1
				2565	21400	21.38	22.5	0-1
		50RB		2505	20800	21.21	22.5	0-1
				2535	21100	21.38	22.5	0-1
				2565	21400	21.36	22.5	0-1
	16-QAM	1 RB	0	2505	20800	21.48	22.5	0-1
				2535	21100	21.22	22.5	0-1
				2565	21400	21.17	22.5	0-1
			25	2505	20800	21.31	22.5	0-1
				2535	21100	21.53	22.5	0-1
				2565	21400	21.18	22.5	0-1
			49	2505	20800	21.26	22.5	0-1
				2535	21100	21.71	22.5	0-1
				2565	21400	21.28	22.5	0-1
		25 RB	0	2505	20800	20.21	21.5	0-2
				2535	21100	20.49	21.5	0-2
				2565	21400	20.29	21.5	0-2
			12	2505	20800	20.18	21.5	0-2
				2535	21100	20.43	21.5	0-2
				2565	21400	20.34	21.5	0-2
			25	2505	20800	20.31	21.5	0-2
				2535	21100	20.52	21.5	0-2
				2565	21400	20.40	21.5	0-2
		50RB		2505	20800	20.22	21.5	0-2
				2535	21100	20.47	21.5	0-2
				2565	21400	20.41	21.5	0-2

FDD Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	2502.5	20775	22.06	23.5	0
				2535	21100	22.28	23.5	0
				2567.5	21425	22.27	23.5	0
			12	2502.5	20775	22.09	23.5	0
				2535	21100	22.23	23.5	0
				2567.5	21425	22.13	23.5	0
			24	2502.5	20775	22.12	23.5	0
				2535	21100	22.33	23.5	0
				2567.5	21425	22.26	23.5	0
		12 RB	0	2502.5	20775	21.22	22.5	0-1
				2535	21100	21.34	22.5	0-1
				2567.5	21425	21.26	22.5	0-1
			6	2502.5	20775	21.15	22.5	0-1
				2535	21100	21.36	22.5	0-1
				2567.5	21425	21.25	22.5	0-1
			13	2502.5	20775	21.22	22.5	0-1
				2535	21100	21.38	22.5	0-1
				2567.5	21425	21.22	22.5	0-1
		25RB		2502.5	20775	21.16	22.5	0-1
				2535	21100	21.37	22.5	0-1
				2567.5	21425	21.28	22.5	0-1
	16-QAM	1 RB	0	2502.5	20775	21.07	22.5	0-1
				2535	21100	21.21	22.5	0-1
				2567.5	21425	21.20	22.5	0-1
			12	2502.5	20775	21.29	22.5	0-1
				2535	21100	21.89	22.5	0-1
				2567.5	21425	21.18	22.5	0-1
			24	2502.5	20775	21.15	22.5	0-1
				2535	21100	21.68	22.5	0-1
				2567.5	21425	21.76	22.5	0-1
		12 RB	0	2502.5	20775	20.10	21.5	0-2
				2535	21100	20.30	21.5	0-2
				2567.5	21425	20.35	21.5	0-2
			6	2502.5	20775	20.17	21.5	0-2
				2535	21100	20.28	21.5	0-2
				2567.5	21425	20.37	21.5	0-2
			13	2502.5	20775	20.25	21.5	0-2
				2535	21100	20.32	21.5	0-2
				2567.5	21425	20.27	21.5	0-2
		25RB		2502.5	20775	20.23	21.5	0-2
				2535	21100	20.36	21.5	0-2
				2567.5	21425	20.23	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	22.40	23.5	0
				707.5	23095	22.30	23.5	0
				711	23130	22.23	23.5	0
			25	704	23060	22.37	23.5	0
				707.5	23095	22.39	23.5	0
				711	23130	22.30	23.5	0
			49	704	23060	22.50	23.5	0
				707.5	23095	22.44	23.5	0
				711	23130	22.31	23.5	0
		25 RB	0	704	23060	21.38	22.5	0-1
				707.5	23095	21.34	22.5	0-1
				711	23130	21.37	22.5	0-1
			12	704	23060	21.40	22.5	0-1
				707.5	23095	21.38	22.5	0-1
				711	23130	21.32	22.5	0-1
			25	704	23060	21.49	22.5	0-1
				707.5	23095	21.48	22.5	0-1
				711	23130	21.46	22.5	0-1
		50RB		704	23060	21.49	22.5	0-1
				707.5	23095	21.44	22.5	0-1
				711	23130	21.43	22.5	0-1
	16-QAM	1 RB	0	704	23060	21.32	22.5	0-1
				707.5	23095	21.93	22.5	0-1
				711	23130	22.05	22.5	0-1
			25	704	23060	22.20	22.5	0-1
				707.5	23095	21.73	22.5	0-1
				711	23130	22.17	22.5	0-1
			49	704	23060	21.84	22.5	0-1
				707.5	23095	21.76	22.5	0-1
				711	23130	21.57	22.5	0-1
		25 RB	0	704	23060	20.56	21.5	0-2
				707.5	23095	20.50	21.5	0-2
				711	23130	20.42	21.5	0-2
			12	704	23060	20.55	21.5	0-2
				707.5	23095	20.40	21.5	0-2
				711	23130	20.39	21.5	0-2
			25	704	23060	20.67	21.5	0-2
				707.5	23095	20.40	21.5	0-2
				711	23130	20.56	21.5	0-2
		50RB		704	23060	20.70	21.5	0-2
				707.5	23095	20.67	21.5	0-2
				711	23130	20.55	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	22.38	23.5	0
				707.5	23095	22.30	23.5	0
				713.5	23155	22.23	23.5	0
			12	701.5	23035	22.38	23.5	0
				707.5	23095	22.26	23.5	0
				713.5	23155	22.21	23.5	0
			24	701.5	23035	22.44	23.5	0
				707.5	23095	22.38	23.5	0
				713.5	23155	22.45	23.5	0
		12 RB	0	701.5	23035	21.35	22.5	0-1
				707.5	23095	21.28	22.5	0-1
				713.5	23155	21.29	22.5	0-1
			6	701.5	23035	21.36	22.5	0-1
				707.5	23095	21.34	22.5	0-1
				713.5	23155	21.17	22.5	0-1
			13	701.5	23035	21.40	22.5	0-1
				707.5	23095	21.47	22.5	0-1
				713.5	23155	21.16	22.5	0-1
		25RB		701.5	23035	21.41	22.5	0-1
				707.5	23095	21.31	22.5	0-1
				713.5	23155	21.17	22.5	0-1
	16-QAM	1 RB	0	701.5	23035	21.49	22.5	0-1
				707.5	23095	21.90	22.5	0-1
				713.5	23155	21.44	22.5	0-1
			12	701.5	23035	22.15	22.5	0-1
				707.5	23095	21.71	22.5	0-1
				713.5	23155	21.93	22.5	0-1
			24	701.5	23035	21.95	22.5	0-1
				707.5	23095	21.71	22.5	0-1
				713.5	23155	22.22	22.5	0-1
		12 RB	0	701.5	23035	20.43	21.5	0-2
				707.5	23095	20.48	21.5	0-2
				713.5	23155	20.39	21.5	0-2
			6	701.5	23035	20.45	21.5	0-2
				707.5	23095	20.38	21.5	0-2
				713.5	23155	20.39	21.5	0-2
			13	701.5	23035	20.49	21.5	0-2
				707.5	23095	20.35	21.5	0-2
				713.5	23155	20.58	21.5	0-2
		25RB		701.5	23035	20.49	21.5	0-2
				707.5	23095	20.52	21.5	0-2
				713.5	23155	20.42	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)
3	QPSK	1 RB	0	700.5	23025	22.24	23.5	0
				707.5	23095	22.15	23.5	0
				714.5	23165	22.28	23.5	0
			7	700.5	23025	22.44	23.5	0
				707.5	23095	22.37	23.5	0
				714.5	23165	22.31	23.5	0
			14	700.5	23025	22.38	23.5	0
				707.5	23095	22.33	23.5	0
				714.5	23165	22.36	23.5	0
		8 RB	0	700.5	23025	21.29	22.5	0-1
				707.5	23095	21.31	22.5	0-1
				714.5	23165	21.27	22.5	0-1
			4	700.5	23025	21.36	22.5	0-1
				707.5	23095	21.27	22.5	0-1
				714.5	23165	21.28	22.5	0-1
			7	700.5	23025	21.42	22.5	0-1
				707.5	23095	21.32	22.5	0-1
				714.5	23165	21.44	22.5	0-1
		15RB		700.5	23025	21.37	22.5	0-1
				707.5	23095	21.28	22.5	0-1
				714.5	23165	21.43	22.5	0-1
	16-QAM	1 RB	0	700.5	23025	22.11	22.5	0-1
				707.5	23095	21.66	22.5	0-1
				714.5	23165	21.51	22.5	0-1
			7	700.5	23025	21.59	22.5	0-1
				707.5	23095	21.67	22.5	0-1
				714.5	23165	21.97	22.5	0-1
			14	700.5	23025	22.04	22.5	0-1
				707.5	23095	21.57	22.5	0-1
				714.5	23165	21.62	22.5	0-1
		8 RB	0	700.5	23025	20.46	21.5	0-2
				707.5	23095	20.54	21.5	0-2
				714.5	23165	20.28	21.5	0-2
			4	700.5	23025	20.42	21.5	0-2
				707.5	23095	20.42	21.5	0-2
				714.5	23165	20.41	21.5	0-2
			7	700.5	23025	20.46	21.5	0-2
				707.5	23095	20.54	21.5	0-2
				714.5	23165	20.44	21.5	0-2
		15RB		700.5	23025	20.37	21.5	0-2
				707.5	23095	20.46	21.5	0-2
				714.5	23165	20.48	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)
1.4	QPSK	1 RB	0	699.7	23017	22.32	23.5	0
				707.5	23095	22.44	23.5	0
				715.3	23173	22.31	23.5	0
			2	699.7	23017	22.34	23.5	0
				707.5	23095	22.24	23.5	0
				715.3	23173	22.35	23.5	0
			5	699.7	23017	22.33	23.5	0
				707.5	23095	22.23	23.5	0
				715.3	23173	22.27	23.5	0
		3 RB	0	699.7	23017	22.28	22.5	0
				707.5	23095	22.29	22.5	0
				715.3	23173	22.26	22.5	0
			2	699.7	23017	22.36	22.5	0
				707.5	23095	22.35	22.5	0
				715.3	23173	22.25	22.5	0
			3	699.7	23017	22.34	22.5	0
				707.5	23095	22.26	22.5	0
				715.3	23173	22.34	22.5	0
		6RB		699.7	23017	21.41	22.5	0-1
				707.5	23095	21.28	22.5	0-1
				715.3	23173	21.28	22.5	0-1
	16-QAM	1 RB	0	699.7	23017	21.55	22.5	0-1
				707.5	23095	21.81	22.5	0-1
				715.3	23173	21.94	22.5	0-1
			2	699.7	23017	21.93	22.5	0-1
				707.5	23095	21.74	22.5	0-1
				715.3	23173	21.86	22.5	0-1
			5	699.7	23017	21.78	22.5	0-1
				707.5	23095	21.70	22.5	0-1
				715.3	23173	21.51	22.5	0-1
		3 RB	0	699.7	23017	21.38	21.5	0-1
				707.5	23095	21.39	21.5	0-1
				715.3	23173	21.47	21.5	0-1
			2	699.7	23017	21.44	21.5	0-1
				707.5	23095	21.27	21.5	0-1
				715.3	23173	21.38	21.5	0-1
			3	699.7	23017	21.27	21.5	0-1
				707.5	23095	21.31	21.5	0-1
				715.3	23173	21.45	21.5	0-1
		6RB		699.7	23017	20.36	21.5	0-2
				707.5	23095	20.46	21.5	0-2
				715.3	23173	20.22	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	22.59	23.5	0
			25	782	23230	22.68	23.5	0
			49	782	23230	22.54	23.5	0
		25 RB	0	782	23230	21.52	22.5	0-1
			12	782	23230	21.58	22.5	0-1
			25	782	23230	21.51	22.5	0-1
		50RB		782	23230	21.62	22.5	0-1
	16-QAM	1 RB	0	782	23230	22.19	22.5	0-1
			25	782	23230	22.29	22.5	0-1
			49	782	23230	21.88	22.5	0-1
		25 RB	0	782	23230	20.71	21.5	0-2
			12	782	23230	20.64	21.5	0-2
			25	782	23230	20.71	21.5	0-2
		50RB		782	23230	20.70	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)
5	QPSK	1 RB	0	779.5	23205	22.62	23.5	0
				782	23230	22.65	23.5	0
				784.5	23255	22.74	23.5	0
			12	779.5	23205	22.60	23.5	0
				782	23230	22.65	23.5	0
				784.5	23255	22.57	23.5	0
			24	779.5	23205	22.42	23.5	0
				782	23230	22.59	23.5	0
				784.5	23255	22.47	23.5	0
		12 RB	0	779.5	23205	21.49	22.5	0-1
				782	23230	21.50	22.5	0-1
				784.5	23255	21.44	22.5	0-1
			6	779.5	23205	21.43	22.5	0-1
				782	23230	21.50	22.5	0-1
				784.5	23255	21.48	22.5	0-1
			13	779.5	23205	21.50	22.5	0-1
				782	23230	21.53	22.5	0-1
				784.5	23255	21.48	22.5	0-1
		25RB		779.5	23205	21.42	22.5	0-1
				782	23230	21.59	22.5	0-1
				784.5	23255	21.52	22.5	0-1
	16-QAM	1 RB	0	779.5	23205	21.98	22.5	0-1
				782	23230	21.84	22.5	0-1
				784.5	23255	21.84	22.5	0-1
			12	779.5	23205	22.17	22.5	0-1
				782	23230	22.10	22.5	0-1
				784.5	23255	22.12	22.5	0-1
			24	779.5	23205	21.72	22.5	0-1
				782	23230	21.83	22.5	0-1
				784.5	23255	22.21	22.5	0-1
		12 RB	0	779.5	23205	20.46	21.5	0-2
				782	23230	20.55	21.5	0-2
				784.5	23255	20.57	21.5	0-2
			6	779.5	23205	20.51	21.5	0-2
				782	23230	20.57	21.5	0-2
				784.5	23255	20.49	21.5	0-2
			13	779.5	23205	20.51	21.5	0-2
				782	23230	20.59	21.5	0-2
				784.5	23255	20.45	21.5	0-2
		25RB		779.5	23205	20.56	21.5	0-2
				782	23230	20.56	21.5	0-2
				784.5	23255	20.63	21.5	0-2

FDD Band 17								
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	709	23780	22.40	23	0
				710	23790	22.34	23	0
				711	23800	22.28	23	0
			25	709	23780	22.32	23	0
				710	23790	22.41	23	0
				711	23800	22.43	23	0
			49	709	23780	22.44	23	0
				710	23790	22.61	23	0
				711	23800	22.47	23	0
		25 RB	0	709	23780	21.37	22	0-1
				710	23790	21.41	22	0-1
				711	23800	21.40	22	0-1
			12	709	23780	21.35	22	0-1
				710	23790	21.39	22	0-1
				711	23800	21.33	22	0-1
			25	709	23780	21.42	22	0-1
				710	23790	21.45	22	0-1
				711	23800	21.41	22	0-1
		50RB		709	23780	21.38	22	0-1
				710	23790	21.50	22	0-1
				711	23800	21.46	22	0-1
	16-QAM	1 RB	0	709	23780	21.45	22	0-1
				710	23790	21.64	22	0-1
				711	23800	21.95	22	0-1
			25	709	23780	21.53	22	0-1
				710	23790	21.09	22	0-1
				711	23800	21.85	22	0-1
			49	709	23780	21.93	22	0-1
				710	23790	21.53	22	0-1
				711	23800	21.87	22	0-1
		25 RB	0	709	23780	20.48	21	0-2
				710	23790	20.60	21	0-2
				711	23800	20.44	21	0-2
			12	709	23780	20.62	21	0-2
				710	23790	20.48	21	0-2
				711	23800	20.44	21	0-2
			25	709	23780	20.47	21	0-2
				710	23790	20.57	21	0-2
				711	23800	20.67	21	0-2
		50RB		709	23780	20.49	21	0-2
				710	23790	20.49	21	0-2
				711	23800	20.63	21	0-2

FDD Band 17								
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	706.5	23755	22.30	23	0
				710	23790	22.31	23	0
				713.5	23825	22.22	23	0
			12	706.5	23755	22.44	23	0
				710	23790	22.37	23	0
				713.5	23825	22.26	23	0
			24	706.5	23755	22.45	23	0
				710	23790	22.44	23	0
				713.5	23825	22.36	23	0
		12 RB	0	706.5	23755	21.30	22	0-1
				710	23790	21.45	22	0-1
				713.5	23825	21.32	22	0-1
			6	706.5	23755	21.35	22	0-1
				710	23790	21.46	22	0-1
				713.5	23825	21.29	22	0-1
			13	706.5	23755	21.37	22	0-1
				710	23790	21.28	22	0-1
				713.5	23825	21.31	22	0-1
		25RB		706.5	23755	21.33	22	0-1
				710	23790	21.26	22	0-1
				713.5	23825	21.24	22	0-1
	16-QAM	1 RB	0	706.5	23755	22.21	22	0-1
				710	23790	22.12	22	0-1
				713.5	23825	21.44	22	0-1
			12	706.5	23755	21.45	22	0-1
				710	23790	21.70	22	0-1
				713.5	23825	22.05	22	0-1
			24	706.5	23755	21.78	22	0-1
				710	23790	21.75	22	0-1
				713.5	23825	21.97	22	0-1
		12 RB	0	706.5	23755	20.55	21	0-2
				710	23790	20.42	21	0-2
				713.5	23825	20.35	21	0-2
			6	706.5	23755	20.48	21	0-2
				710	23790	20.37	21	0-2
				713.5	23825	20.34	21	0-2
			13	706.5	23755	20.57	21	0-2
				710	23790	20.36	21	0-2
				713.5	23825	20.54	21	0-2
		25RB		706.5	23755	20.55	21	0-2
				710	23790	20.48	21	0-2
				713.5	23825	20.46	21	0-2

FDD Band 26								
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	821.5	26765	22.42	23	0
				831.5	26865	22.32	23	0
				841.5	26965	22.44	23	0
			36	821.5	26765	22.45	23	0
				831.5	26865	22.37	23	0
				841.5	26965	22.37	23	0
			74	821.5	26765	22.46	23	0
				831.5	26865	22.47	23	0
				841.5	26965	22.45	23	0
		36 RB	0	821.5	26765	21.35	22	0-1
				831.5	26865	21.43	22	0-1
				841.5	26965	21.37	22	0-1
			18	821.5	26765	21.46	22	0-1
				831.5	26865	21.63	22	0-1
				841.5	26965	21.47	22	0-1
			37	821.5	26765	21.49	22	0-1
				831.5	26865	21.64	22	0-1
				841.5	26965	21.53	22	0-1
		75RB		821.5	26765	21.58	22	0-1
				831.5	26865	21.75	22	0-1
				841.5	26965	21.51	22	0-1
	16-QAM	1 RB	0	821.5	26765	21.65	22	0-1
				831.5	26865	21.69	22	0-1
				841.5	26965	21.98	22	0-1
			36	821.5	26765	22.00	22	0-1
				831.5	26865	21.90	22	0-1
				841.5	26965	21.62	22	0-1
			74	821.5	26765	21.88	22	0-1
				831.5	26865	21.62	22	0-1
				841.5	26965	21.58	22	0-1
		36 RB	0	821.5	26765	20.45	21	0-2
				831.5	26865	20.41	21	0-2
				841.5	26965	20.43	21	0-2
			18	821.5	26765	20.46	21	0-2
				831.5	26865	20.70	21	0-2
				841.5	26965	20.72	21	0-2
			37	821.5	26765	20.64	21	0-2
				831.5	26865	20.63	21	0-2
				841.5	26965	20.61	21	0-2
		75RB		821.5	26765	20.54	21	0-2
				831.5	26865	20.66	21	0-2
				841.5	26965	20.75	21	0-2

FDD Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	819	26740	22.34	23	0
				831.5	26865	22.41	23	0
				844	26990	22.50	23	0
			25	819	26740	22.46	23	0
				831.5	26865	22.42	23	0
				844	26990	22.47	23	0
			49	819	26740	22.47	23	0
				831.5	26865	22.57	23	0
				844	26990	22.50	23	0
		25 RB	0	819	26740	21.36	22	0-1
				831.5	26865	21.46	22	0-1
				844	26990	21.53	22	0-1
			12	819	26740	21.36	22	0-1
				831.5	26865	21.52	22	0-1
				844	26990	21.49	22	0-1
			25	819	26740	21.41	22	0-1
				831.5	26865	21.47	22	0-1
				844	26990	21.49	22	0-1
		50RB		819	26740	21.36	22	0-1
				831.5	26865	21.45	22	0-1
				844	26990	21.61	22	0-1
	16-QAM	1 RB	0	819	26740	21.91	22	0-1
				831.5	26865	21.78	22	0-1
				844	26990	21.97	22	0-1
			25	819	26740	21.95	22	0-1
				831.5	26865	21.76	22	0-1
				844	26990	21.60	22	0-1
			49	819	26740	21.34	22	0-1
				831.5	26865	21.91	22	0-1
				844	26990	21.99	22	0-1
		25 RB	0	819	26740	20.50	21	0-2
				831.5	26865	20.48	21	0-2
				844	26990	20.57	21	0-2
			12	819	26740	20.48	21	0-2
				831.5	26865	20.52	21	0-2
				844	26990	20.56	21	0-2
			25	819	26740	20.43	21	0-2
				831.5	26865	20.57	21	0-2
				844	26990	20.61	21	0-2
		50RB		819	26740	20.46	21	0-2
				831.5	26865	20.53	21	0-2
				844	26990	20.69	21	0-2

FDD Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	816.5	26715	22.27	23	0
				831.5	26865	22.35	23	0
				846.5	27015	22.43	23	0
			12	816.5	26715	22.39	23	0
				831.5	26865	22.38	23	0
				846.5	27015	22.42	23	0
			24	816.5	26715	22.42	23	0
				831.5	26865	22.55	23	0
				846.5	27015	22.46	23	0
		12 RB	0	816.5	26715	21.18	22	0-1
				831.5	26865	21.33	22	0-1
				846.5	27015	21.34	22	0-1
			6	816.5	26715	21.25	22	0-1
				831.5	26865	21.36	22	0-1
				846.5	27015	21.31	22	0-1
			13	816.5	26715	21.30	22	0-1
				831.5	26865	21.47	22	0-1
				846.5	27015	21.29	22	0-1
		25RB		816.5	26715	21.22	22	0-1
				831.5	26865	21.50	22	0-1
				846.5	27015	21.43	22	0-1
	16-QAM	1 RB	0	816.5	26715	21.27	22	0-1
				831.5	26865	21.72	22	0-1
				846.5	27015	21.90	22	0-1
			12	816.5	26715	21.55	22	0-1
				831.5	26865	21.73	22	0-1
				846.5	27015	21.61	22	0-1
			24	816.5	26715	21.36	22	0-1
				831.5	26865	21.72	22	0-1
				846.5	27015	21.72	22	0-1
		12 RB	0	816.5	26715	20.47	21	0-2
				831.5	26865	20.43	21	0-2
				846.5	27015	20.32	21	0-2
			6	816.5	26715	20.36	21	0-2
				831.5	26865	20.53	21	0-2
				846.5	27015	20.19	21	0-2
			13	816.5	26715	20.34	21	0-2
				831.5	26865	20.66	21	0-2
				846.5	27015	20.33	21	0-2
		25RB		816.5	26715	20.36	21	0-2
				831.5	26865	20.57	21	0-2
				846.5	27015	20.34	21	0-2

FDD Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	815.5	26705	22.18	23	0
				831.5	26865	22.28	23	0
				847.5	27025	22.39	23	0
			7	815.5	26705	22.32	23	0
				831.5	26865	22.49	23	0
				847.5	27025	22.32	23	0
			14	815.5	26705	22.35	23	0
				831.5	26865	22.42	23	0
				847.5	27025	22.40	23	0
		8 RB	0	815.5	26705	21.21	22	0-1
				831.5	26865	21.45	22	0-1
				847.5	27025	21.30	22	0-1
			4	815.5	26705	21.24	22	0-1
				831.5	26865	21.46	22	0-1
				847.5	27025	21.33	22	0-1
			7	815.5	26705	21.30	22	0-1
				831.5	26865	21.46	22	0-1
				847.5	27025	21.47	22	0-1
		15RB		815.5	26705	21.23	22	0-1
				831.5	26865	21.45	22	0-1
				847.5	27025	21.46	22	0-1
	16-QAM	1 RB	0	815.5	26705	21.47	22	0-1
				831.5	26865	21.66	22	0-1
				847.5	27025	21.36	22	0-1
			7	815.5	26705	21.98	22	0-1
				831.5	26865	21.75	22	0-1
				847.5	27025	21.85	22	0-1
			14	815.5	26705	21.56	22	0-1
				831.5	26865	21.88	22	0-1
				847.5	27025	21.46	22	0-1
		8 RB	0	815.5	26705	20.45	21	0-2
				831.5	26865	20.58	21	0-2
				847.5	27025	20.36	21	0-2
			4	815.5	26705	20.39	21	0-2
				831.5	26865	20.62	21	0-2
				847.5	27025	20.54	21	0-2
			7	815.5	26705	20.40	21	0-2
				831.5	26865	20.64	21	0-2
				847.5	27025	20.51	21	0-2
		15RB		815.5	26705	20.29	21	0-2
				831.5	26865	20.48	21	0-2
				847.5	27025	20.36	21	0-2

FDD Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	814.7	26697	22.13	23	0
				831.5	26865	22.46	23	0
				848.3	27033	22.39	23	0
			2	814.7	26697	22.16	23	0
				831.5	26865	22.40	23	0
				848.3	27033	22.38	23	0
			5	814.7	26697	22.17	23	0
				831.5	26865	22.44	23	0
				848.3	27033	22.39	23	0
		3 RB	0	814.7	26697	22.24	23	0
				831.5	26865	22.45	23	0
				848.3	27033	22.40	23	0
			2	814.7	26697	22.23	23	0
				831.5	26865	22.44	23	0
				848.3	27033	22.40	23	0
			3	814.7	26697	22.25	23	0
				831.5	26865	22.42	23	0
				848.3	27033	22.42	23	0
		6RB		814.7	26697	21.19	22	0-1
				831.5	26865	21.45	22	0-1
				848.3	27033	21.42	22	0-1
	16-QAM	1 RB	0	814.7	26697	21.41	22	0-1
				831.5	26865	21.68	22	0-1
				848.3	27033	21.85	22	0-1
			2	814.7	26697	21.88	22	0-1
				831.5	26865	21.47	22	0-1
				848.3	27033	21.87	22	0-1
			5	814.7	26697	21.49	22	0-1
				831.5	26865	21.73	22	0-1
				848.3	27033	21.57	22	0-1
		3 RB	0	814.7	26697	21.34	22	0-1
				831.5	26865	21.49	22	0-1
				848.3	27033	21.57	22	0-1
			2	814.7	26697	21.33	22	0-1
				831.5	26865	21.46	22	0-1
				848.3	27033	21.69	22	0-1
			3	814.7	26697	21.57	22	0-1
				831.5	26865	21.56	22	0-1
				848.3	27033	21.58	22	0-1
		6RB		814.7	26697	20.32	21	0-2
				831.5	26865	20.64	21	0-2
				848.3	27033	20.48	21	0-2

FDD Band 30								
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	2310	27710	22.47	23.5	0
			25	2310	27710	22.17	23.5	0
			49	2310	27710	22.36	23.5	0
		25 RB	0	2310	27710	21.49	22.5	0-1
			12	2310	27710	21.45	22.5	0-1
			25	2310	27710	21.39	22.5	0-1
		50RB		2310	27710	21.35	22.5	0-1
	16-QAM	1 RB	0	2310	27710	21.84	22.5	0-1
			25	2310	27710	21.05	22.5	0-1
			49	2310	27710	21.78	22.5	0-1
		25 RB	0	2310	27710	20.58	21.5	0-2
			12	2310	27710	20.53	21.5	0-2
			25	2310	27710	20.46	21.5	0-2
		50RB		2310	27710	20.37	21.5	0-2

FDD Band 30								
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	2307.5	27685	22.36	23.5	0
				2310	27710	22.39	23.5	0
				2312.5	27735	22.09	23.5	0
			12	2307.5	27685	22.30	23.5	0
				2310	27710	22.10	23.5	0
				2312.5	27735	22.19	23.5	0
			24	2307.5	27685	22.16	23.5	0
				2310	27710	22.26	23.5	0
				2312.5	27735	22.36	23.5	0
		12 RB	0	2307.5	27685	21.34	22.5	0-1
				2310	27710	21.36	22.5	0-1
				2312.5	27735	21.20	22.5	0-1
			6	2307.5	27685	21.27	22.5	0-1
				2310	27710	21.27	22.5	0-1
				2312.5	27735	21.27	22.5	0-1
			13	2307.5	27685	21.29	22.5	0-1
				2310	27710	21.36	22.5	0-1
				2312.5	27735	21.25	22.5	0-1
		25RB		2307.5	27685	21.37	22.5	0-1
				2310	27710	21.31	22.5	0-1
				2312.5	27735	21.18	22.5	0-1
	16-QAM	1 RB	0	2307.5	27685	21.18	22.5	0-1
				2310	27710	21.84	22.5	0-1
				2312.5	27735	21.30	22.5	0-1
			12	2307.5	27685	21.75	22.5	0-1
				2310	27710	21.15	22.5	0-1
				2312.5	27735	21.61	22.5	0-1
			24	2307.5	27685	21.82	22.5	0-1
				2310	27710	21.60	22.5	0-1
				2312.5	27735	21.59	22.5	0-1
		12 RB	0	2307.5	27685	20.30	21.5	0-2
				2310	27710	20.37	21.5	0-2
				2312.5	27735	20.13	21.5	0-2
			6	2307.5	27685	20.40	21.5	0-2
				2310	27710	20.29	21.5	0-2
				2312.5	27735	20.32	21.5	0-2
			13	2307.5	27685	20.30	21.5	0-2
				2310	27710	20.23	21.5	0-2
				2312.5	27735	20.31	21.5	0-2
		25RB		2307.5	27685	20.43	21.5	0-2
				2310	27710	20.29	21.5	0-2
				2312.5	27735	20.39	21.5	0-2

FDD Band 66								
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	132072	22.47	23.5	0
				1745	132322	22.44	23.5	0
				1770	132572	22.65	23.5	0
			50	1720	132072	22.46	23.5	0
				1745	132322	22.56	23.5	0
				1770	132572	22.30	23.5	0
			99	1720	132072	22.50	23.5	0
				1745	132322	22.71	23.5	0
				1770	132572	22.70	23.5	0
		50 RB	0	1720	132072	21.60	22.5	0-1
				1745	132322	21.53	22.5	0-1
				1770	132572	21.48	22.5	0-1
			25	1720	132072	21.58	22.5	0-1
				1745	132322	21.60	22.5	0-1
				1770	132572	21.41	22.5	0-1
			50	1720	132072	21.63	22.5	0-1
				1745	132322	21.78	22.5	0-1
				1770	132572	21.49	22.5	0-1
		100RB		1720	132072	21.76	22.5	0-1
				1745	132322	21.79	22.5	0-1
				1770	132572	21.75	22.5	0-1
	16-QAM	1 RB	0	1720	132072	21.74	22.5	0-1
				1745	132322	22.19	22.5	0-1
				1770	132572	21.83	22.5	0-1
			50	1720	132072	21.90	22.5	0-1
				1745	132322	21.86	22.5	0-1
				1770	132572	21.77	22.5	0-1
			99	1720	132072	21.63	22.5	0-1
				1745	132322	22.11	22.5	0-1
				1770	132572	21.79	22.5	0-1
		50 RB	0	1720	132072	20.58	21.5	0-2
				1745	132322	20.53	21.5	0-2
				1770	132572	20.54	21.5	0-2
			25	1720	132072	20.56	21.5	0-2
				1745	132322	20.55	21.5	0-2
				1770	132572	20.39	21.5	0-2
			50	1720	132072	20.52	21.5	0-2
				1745	132322	20.71	21.5	0-2
				1770	132572	20.49	21.5	0-2
		100RB		1720	132072	20.78	21.5	0-2
				1745	132322	20.79	21.5	0-2
				1770	132572	20.66	21.5	0-2

FDD Band 66								
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	132047	22.54	23.5	0
				1745	132322	22.62	23.5	0
				1772.5	132597	22.52	23.5	0
			36	1717.5	132047	22.74	23.5	0
				1745	132322	22.65	23.5	0
				1772.5	132597	22.43	23.5	0
			74	1717.5	132047	22.31	23.5	0
				1745	132322	22.48	23.5	0
				1772.5	132597	22.39	23.5	0
		36 RB	0	1717.5	132047	21.55	22.5	0-1
				1745	132322	21.44	22.5	0-1
				1772.5	132597	21.38	22.5	0-1
			18	1717.5	132047	21.61	22.5	0-1
				1745	132322	21.58	22.5	0-1
				1772.5	132597	21.40	22.5	0-1
			37	1717.5	132047	21.60	22.5	0-1
				1745	132322	21.66	22.5	0-1
				1772.5	132597	21.54	22.5	0-1
		75RB		1717.5	132047	21.74	22.5	0-1
				1745	132322	21.65	22.5	0-1
				1772.5	132597	21.57	22.5	0-1
	16-QAM	1 RB	0	1717.5	132047	21.81	22.5	0-1
				1745	132322	22.13	22.5	0-1
				1772.5	132597	21.66	22.5	0-1
			36	1717.5	132047	22.21	22.5	0-1
				1745	132322	21.75	22.5	0-1
				1772.5	132597	21.50	22.5	0-1
			74	1717.5	132047	21.87	22.5	0-1
				1745	132322	21.85	22.5	0-1
				1772.5	132597	22.28	22.5	0-1
		36 RB	0	1717.5	132047	20.51	21.5	0-2
				1745	132322	20.42	21.5	0-2
				1772.5	132597	20.31	21.5	0-2
			18	1717.5	132047	20.53	21.5	0-2
				1745	132322	20.51	21.5	0-2
				1772.5	132597	20.32	21.5	0-2
			37	1717.5	132047	20.48	21.5	0-2
				1745	132322	20.65	21.5	0-2
				1772.5	132597	20.46	21.5	0-2
		75RB		1717.5	132047	20.62	21.5	0-2
				1745	132322	20.65	21.5	0-2
				1772.5	132597	20.55	21.5	0-2

FDD Band 66								
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	132022	22.42	23.5	0
				1745	132322	22.46	23.5	0
				1775	132622	22.32	23.5	0
			25	1715	132022	22.40	23.5	0
				1745	132322	22.54	23.5	0
				1775	132622	22.53	23.5	0
			49	1715	132022	22.59	23.5	0
				1745	132322	22.62	23.5	0
				1775	132622	22.49	23.5	0
		25 RB	0	1715	132022	21.45	22.5	0-1
				1745	132322	21.39	22.5	0-1
				1775	132622	21.35	22.5	0-1
			12	1715	132022	21.54	22.5	0-1
				1745	132322	21.50	22.5	0-1
				1775	132622	21.39	22.5	0-1
			25	1715	132022	21.59	22.5	0-1
				1745	132322	21.52	22.5	0-1
				1775	132622	21.47	22.5	0-1
		50RB		1715	132022	21.61	22.5	0-1
				1745	132322	21.62	22.5	0-1
				1775	132622	21.54	22.5	0-1
	16-QAM	1 RB	0	1715	132022	21.84	22.5	0-1
				1745	132322	21.76	22.5	0-1
				1775	132622	21.69	22.5	0-1
			25	1715	132022	21.95	22.5	0-1
				1745	132322	22.15	22.5	0-1
				1775	132622	21.56	22.5	0-1
			49	1715	132022	22.12	22.5	0-1
				1745	132322	22.44	22.5	0-1
				1775	132622	21.70	22.5	0-1
		25 RB	0	1715	132022	20.39	21.5	0-2
				1745	132322	20.36	21.5	0-2
				1775	132622	20.20	21.5	0-2
			12	1715	132022	20.47	21.5	0-2
				1745	132322	20.39	21.5	0-2
				1775	132622	20.27	21.5	0-2
			25	1715	132022	20.48	21.5	0-2
				1745	132322	20.46	21.5	0-2
				1775	132622	20.44	21.5	0-2
		50RB		1715	132022	20.50	21.5	0-2
				1745	132322	20.52	21.5	0-2
				1775	132622	20.60	21.5	0-2

FDD Band 66								
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	131997	22.42	23.5	0
				1745	132322	22.64	23.5	0
				1777.5	132647	22.37	23.5	0
			12	1712.5	131997	22.45	23.5	0
				1745	132322	22.54	23.5	0
				1777.5	132647	22.61	23.5	0
			24	1712.5	131997	22.59	23.5	0
				1745	132322	22.63	23.5	0
				1777.5	132647	22.84	23.5	0
		12 RB	0	1712.5	131997	21.27	22.5	0-1
				1745	132322	21.34	22.5	0-1
				1777.5	132647	21.35	22.5	0-1
			6	1712.5	131997	21.29	22.5	0-1
				1745	132322	21.42	22.5	0-1
				1777.5	132647	21.36	22.5	0-1
			13	1712.5	131997	21.41	22.5	0-1
				1745	132322	21.40	22.5	0-1
				1777.5	132647	21.46	22.5	0-1
		25RB		1712.5	131997	21.41	22.5	0-1
				1745	132322	21.57	22.5	0-1
				1777.5	132647	21.49	22.5	0-1
	16-QAM	1 RB	0	1712.5	131997	21.67	22.5	0-1
				1745	132322	21.61	22.5	0-1
				1777.5	132647	21.75	22.5	0-1
			12	1712.5	131997	21.85	22.5	0-1
				1745	132322	21.68	22.5	0-1
				1777.5	132647	22.13	22.5	0-1
			24	1712.5	131997	22.14	22.5	0-1
				1745	132322	22.36	22.5	0-1
				1777.5	132647	21.80	22.5	0-1
		12 RB	0	1712.5	131997	20.30	21.5	0-2
				1745	132322	20.38	21.5	0-2
				1777.5	132647	20.16	21.5	0-2
			6	1712.5	131997	20.24	21.5	0-2
				1745	132322	20.20	21.5	0-2
				1777.5	132647	20.33	21.5	0-2
			13	1712.5	131997	20.24	21.5	0-2
				1745	132322	20.30	21.5	0-2
				1777.5	132647	20.11	21.5	0-2
		25RB		1712.5	131997	20.49	21.5	0-2
				1745	132322	20.42	21.5	0-2
				1777.5	132647	20.45	21.5	0-2

FDD Band 66								
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	131987	22.27	23.5	0
				1745	132322	22.52	23.5	0
				1778.5	132657	22.37	23.5	0
			7	1711.5	131987	22.44	23.5	0
				1745	132322	22.42	23.5	0
				1778.5	132657	22.41	23.5	0
			14	1711.5	131987	22.30	23.5	0
				1745	132322	22.40	23.5	0
				1778.5	132657	22.67	23.5	0
		8 RB	0	1711.5	131987	21.30	22.5	0-1
				1745	132322	21.44	22.5	0-1
				1778.5	132657	21.39	22.5	0-1
			4	1711.5	131987	21.35	22.5	0-1
				1745	132322	21.34	22.5	0-1
				1778.5	132657	21.38	22.5	0-1
			7	1711.5	131987	21.21	22.5	0-1
				1745	132322	21.34	22.5	0-1
				1778.5	132657	21.42	22.5	0-1
		15RB		1711.5	131987	21.46	22.5	0-1
				1745	132322	21.44	22.5	0-1
				1778.5	132657	21.48	22.5	0-1
	16-QAM	1 RB	0	1711.5	131987	21.57	22.5	0-1
				1745	132322	21.67	22.5	0-1
				1778.5	132657	21.74	22.5	0-1
			7	1711.5	131987	22.10	22.5	0-1
				1745	132322	21.67	22.5	0-1
				1778.5	132657	22.28	22.5	0-1
			14	1711.5	131987	21.72	22.5	0-1
				1745	132322	22.21	22.5	0-1
				1778.5	132657	22.30	22.5	0-1
		8 RB	0	1711.5	131987	20.25	21.5	0-2
				1745	132322	20.28	21.5	0-2
				1778.5	132657	20.32	21.5	0-2
			4	1711.5	131987	20.20	21.5	0-2
				1745	132322	20.51	21.5	0-2
				1778.5	132657	20.50	21.5	0-2
			7	1711.5	131987	20.42	21.5	0-2
				1745	132322	20.18	21.5	0-2
				1778.5	132657	20.64	21.5	0-2
		15RB		1711.5	131987	20.25	21.5	0-2
				1745	132322	20.41	21.5	0-2
				1778.5	132657	20.38	21.5	0-2

FDD Band 66								
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	131979	22.12	23.5	0
				1745	132322	22.73	23.5	0
				1779.3	132665	22.79	23.5	0
			2	1710.7	131979	22.25	23.5	0
				1745	132322	22.59	23.5	0
				1779.3	132665	22.13	23.5	0
			5	1710.7	131979	22.67	23.5	0
				1745	132322	22.50	23.5	0
				1779.3	132665	22.41	23.5	0
		3 RB	0	1710.7	131979	22.36	23.5	0
				1745	132322	22.36	23.5	0
				1779.3	132665	22.51	23.5	0
			2	1710.7	131979	22.27	23.5	0
				1745	132322	22.52	23.5	0
				1779.3	132665	22.63	23.5	0
			3	1710.7	131979	22.27	23.5	0
				1745	132322	22.23	23.5	0
				1779.3	132665	22.55	23.5	0
		6RB		1710.7	131979	21.36	22.5	0-1
				1745	132322	21.55	22.5	0-1
				1779.3	132665	21.46	22.5	0-1
	16-QAM	1 RB	0	1710.7	131979	21.70	22.5	0-1
				1745	132322	21.74	22.5	0-1
				1779.3	132665	21.99	22.5	0-1
			2	1710.7	131979	21.39	22.5	0-1
				1745	132322	21.12	22.5	0-1
				1779.3	132665	21.85	22.5	0-1
			5	1710.7	131979	22.18	22.5	0-1
				1745	132322	21.76	22.5	0-1
				1779.3	132665	22.20	22.5	0-1
		3 RB	0	1710.7	131979	21.61	22.5	0-1
				1745	132322	21.47	22.5	0-1
				1779.3	132665	21.44	22.5	0-1
			2	1710.7	131979	21.09	22.5	0-1
				1745	132322	21.39	22.5	0-1
				1779.3	132665	21.35	22.5	0-1
			3	1710.7	131979	21.55	22.5	0-1
				1745	132322	21.23	22.5	0-1
				1779.3	132665	21.36	22.5	0-1
		6RB		1710.7	131979	20.34	21.5	0-2
				1745	132322	20.55	21.5	0-2
				1779.3	132665	20.33	21.5	0-2

LTE TDD Band 38 / Band 41 power table :

TDD Band 38								
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	2580	37850	22.20	23	0
				2595	38000	22.36	23	0
				2610	38150	22.39	23	0
			50	2580	37850	22.21	23	0
				2595	38000	22.32	23	0
				2610	38150	22.40	23	0
			99	2580	37850	22.23	23	0
				2595	38000	22.39	23	0
				2610	38150	22.41	23	0
		50 RB	0	2580	37850	21.22	22	0-1
				2595	38000	21.32	22	0-1
				2610	38150	21.35	22	0-1
			25	2580	37850	21.21	22	0-1
				2595	38000	21.33	22	0-1
				2610	38150	21.28	22	0-1
			50	2580	37850	21.27	22	0-1
				2595	38000	21.35	22	0-1
				2610	38150	21.38	22	0-1
		100RB		2580	37850	21.27	22	0-1
				2595	38000	21.32	22	0-1
				2610	38150	21.36	22	0-1
	16-QAM	1 RB	0	2580	37850	21.12	22	0-1
				2595	38000	21.14	22	0-1
				2610	38150	21.16	22	0-1
			50	2580	37850	21.03	22	0-1
				2595	38000	21.10	22	0-1
				2610	38150	21.23	22	0-1
			99	2580	37850	21.00	22	0-1
				2595	38000	21.16	22	0-1
				2610	38150	21.27	22	0-1
		50 RB	0	2580	37850	20.24	21	0-2
				2595	38000	20.29	21	0-2
				2610	38150	20.41	21	0-2
			25	2580	37850	20.27	21	0-2
				2595	38000	20.32	21	0-2
				2610	38150	20.38	21	0-2
			50	2580	37850	20.26	21	0-2
				2595	38000	20.35	21	0-2
				2610	38150	20.42	21	0-2
		100RB		2580	37850	20.27	21	0-2
				2595	38000	20.38	21	0-2
				2610	38150	20.44	21	0-2

TDD Band 38								
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	2577.5	37825	22.67	23	0
				2595	38000	22.61	23	0
				2612.5	38175	22.65	23	0
			36	2577.5	37825	22.65	23	0
				2595	38000	22.63	23	0
				2612.5	38175	22.65	23	0
			74	2577.5	37825	22.65	23	0
				2595	38000	22.64	23	0
				2612.5	38175	22.66	23	0
		36 RB	0	2577.5	37825	21.55	22	0-1
				2595	38000	21.56	22	0-1
				2612.5	38175	21.59	22	0-1
			18	2577.5	37825	21.53	22	0-1
				2595	38000	21.59	22	0-1
				2612.5	38175	21.61	22	0-1
			37	2577.5	37825	21.56	22	0-1
				2595	38000	21.56	22	0-1
				2612.5	38175	21.60	22	0-1
		75RB		2577.5	37825	21.52	22	0-1
				2595	38000	21.50	22	0-1
				2612.5	38175	21.57	22	0-1
	16-QAM	1 RB	0	2577.5	37825	21.36	22	0-1
				2595	38000	21.28	22	0-1
				2612.5	38175	21.36	22	0-1
			36	2577.5	37825	21.34	22	0-1
				2595	38000	21.32	22	0-1
				2612.5	38175	21.36	22	0-1
			74	2577.5	37825	21.29	22	0-1
				2595	38000	21.31	22	0-1
				2612.5	38175	21.37	22	0-1
		36 RB	0	2577.5	37825	20.58	21	0-2
				2595	38000	20.62	21	0-2
				2612.5	38175	20.64	21	0-2
			18	2577.5	37825	20.57	21	0-2
				2595	38000	20.59	21	0-2
				2612.5	38175	20.66	21	0-2
			37	2577.5	37825	20.58	21	0-2
				2595	38000	20.61	21	0-2
				2612.5	38175	20.64	21	0-2
		75RB		2577.5	37825	20.54	21	0-2
				2595	38000	20.54	21	0-2
				2612.5	38175	20.56	21	0-2

TDD Band 38								
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	2575	37800	22.57	23	0
				2595	38000	22.57	23	0
				2615	38200	22.60	23	0
			25	2575	37800	22.50	23	0
				2595	38000	22.55	23	0
				2615	38200	22.60	23	0
			49	2575	37800	22.46	23	0
				2595	38000	22.57	23	0
				2615	38200	22.62	23	0
		25 RB	0	2575	37800	21.53	22	0-1
				2595	38000	21.57	22	0-1
				2615	38200	21.62	22	0-1
			12	2575	37800	21.50	22	0-1
				2595	38000	21.58	22	0-1
				2615	38200	21.62	22	0-1
			25	2575	37800	21.51	22	0-1
				2595	38000	21.58	22	0-1
				2615	38200	21.61	22	0-1
		50RB		2575	37800	21.49	22	0-1
				2595	38000	21.58	22	0-1
				2615	38200	21.59	22	0-1
	16-QAM	1 RB	0	2575	37800	21.31	22	0-1
				2595	38000	21.37	22	0-1
				2615	38200	21.39	22	0-1
			25	2575	37800	21.33	22	0-1
				2595	38000	21.36	22	0-1
				2615	38200	21.40	22	0-1
			49	2575	37800	21.32	22	0-1
				2595	38000	21.39	22	0-1
				2615	38200	21.42	22	0-1
		25 RB	0	2575	37800	20.68	21	0-2
				2595	38000	20.68	21	0-2
				2615	38200	20.73	21	0-2
			12	2575	37800	20.66	21	0-2
				2595	38000	20.69	21	0-2
				2615	38200	20.72	21	0-2
			25	2575	37800	20.64	21	0-2
				2595	38000	20.70	21	0-2
				2615	38200	20.74	21	0-2
		50RB		2575	37800	20.55	21	0-2
				2595	38000	20.54	21	0-2
				2615	38200	20.61	21	0-2

TDD Band 38								
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	2572.5	37775	22.48	23	0
				2595	38000	22.47	23	0
				2617.5	38225	22.61	23	0
			12	2572.5	37775	22.45	23	0
				2595	38000	22.43	23	0
				2617.5	38225	22.51	23	0
			24	2572.5	37775	22.48	23	0
				2595	38000	22.47	23	0
				2617.5	38225	22.53	23	0
		12 RB	0	2572.5	37775	21.55	22	0-1
				2595	38000	21.50	22	0-1
				2617.5	38225	21.61	22	0-1
			6	2572.5	37775	21.51	22	0-1
				2595	38000	21.51	22	0-1
				2617.5	38225	21.57	22	0-1
			13	2572.5	37775	21.53	22	0-1
				2595	38000	21.52	22	0-1
				2617.5	38225	21.58	22	0-1
		25RB		2572.5	37775	21.50	22	0-1
				2595	38000	21.50	22	0-1
				2617.5	38225	21.59	22	0-1
	16-QAM	1 RB	0	2572.5	37775	21.30	22	0-1
				2595	38000	21.26	22	0-1
				2617.5	38225	21.37	22	0-1
			12	2572.5	37775	21.23	22	0-1
				2595	38000	21.23	22	0-1
				2617.5	38225	21.34	22	0-1
			24	2572.5	37775	21.26	22	0-1
				2595	38000	21.26	22	0-1
				2617.5	38225	21.37	22	0-1
		12 RB	0	2572.5	37775	20.63	21	0-2
				2595	38000	20.63	21	0-2
				2617.5	38225	20.70	21	0-2
			6	2572.5	37775	20.59	21	0-2
				2595	38000	20.58	21	0-2
				2617.5	38225	20.67	21	0-2
			13	2572.5	37775	20.60	21	0-2
				2595	38000	20.60	21	0-2
				2617.5	38225	20.70	21	0-2
		25RB		2572.5	37775	20.58	21	0-2
				2595	38000	20.54	21	0-2
				2617.5	38225	20.67	21	0-2

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	2506	39750	22.14	23	0
				2549.5	40185	22.31	23	0
				2593	40620	22.42	23	0
				2636.5	41055	22.46	23	0
				2680	41490	22.46	23	0
			50	2506	39750	22.19	23	0
				2549.5	40185	22.34	23	0
				2593	40620	22.52	23	0
				2636.5	41055	22.47	23	0
				2680	41490	22.37	23	0
			99	2506	39750	22.38	23	0
				2549.5	40185	22.35	23	0
				2593	40620	22.76	23	0
				2636.5	41055	22.61	23	0
				2680	41490	22.48	23	0
		50 RB	0	2506	39750	21.19	22	0-1
				2549.5	40185	21.47	22	0-1
				2593	40620	21.45	22	0-1
				2636.5	41055	21.36	22	0-1
				2680	41490	21.45	22	0-1
			25	2506	39750	21.25	22	0-1
				2549.5	40185	21.44	22	0-1
				2593	40620	21.50	22	0-1
				2636.5	41055	21.45	22	0-1
				2680	41490	21.42	22	0-1
			50	2506	39750	21.30	22	0-1
				2549.5	40185	21.49	22	0-1
				2593	40620	21.58	22	0-1
				2636.5	41055	21.46	22	0-1
				2680	41490	21.48	22	0-1
		100RB		2506	39750	21.32	22	0-1
				2549.5	40185	21.47	22	0-1
				2593	40620	21.51	22	0-1
				2636.5	41055	21.48	22	0-1
				2680	41490	21.50	22	0-1

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	16-QAM	1 RB	0	2506	39750	21.01	22	0-1
				2549.5	40185	21.45	22	0-1
				2593	40620	21.24	22	0-1
				2636.5	41055	21.49	22	0-1
				2680	41490	21.31	22	0-1
			50	2506	39750	21.00	22	0-1
				2549.5	40185	21.23	22	0-1
				2593	40620	21.30	22	0-1
				2636.5	41055	21.30	22	0-1
				2680	41490	21.17	22	0-1
			99	2506	39750	21.15	22	0-1
				2549.5	40185	21.16	22	0-1
				2593	40620	21.56	22	0-1
				2636.5	41055	21.25	22	0-1
				2680	41490	21.24	22	0-1
		50 RB	0	2506	39750	20.21	21	0-2
				2549.5	40185	20.55	21	0-2
				2593	40620	20.46	21	0-2
				2636.5	41055	20.57	21	0-2
				2680	41490	20.37	21	0-2
			25	2506	39750	20.21	21	0-2
				2549.5	40185	20.47	21	0-2
				2593	40620	20.47	21	0-2
				2636.5	41055	20.44	21	0-2
				2680	41490	20.38	21	0-2
			50	2506	39750	20.28	21	0-2
				2549.5	40185	20.46	21	0-2
				2593	40620	20.55	21	0-2
				2636.5	41055	20.45	21	0-2
				2680	41490	20.37	21	0-2
		100RB		2506	39750	20.36	21	0-2
				2549.5	40185	20.48	21	0-2
				2593	40620	20.53	21	0-2
				2636.5	41055	20.50	21	0-2
				2680	41490	20.48	21	0-2

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	2503.5	39725	22.17	23	0
				2548.3	40173	22.67	23	0
				2593	40620	22.43	23	0
				2637.8	41068	22.69	23	0
				2682.5	41515	22.52	23	0
			36	2503.5	39725	22.19	23	0
				2548.3	40173	22.57	23	0
				2593	40620	22.56	23	0
				2637.8	41068	22.59	23	0
				2682.5	41515	22.46	23	0
			74	2503.5	39725	22.32	23	0
				2548.3	40173	22.44	23	0
				2593	40620	22.70	23	0
				2637.8	41068	22.42	23	0
				2682.5	41515	22.46	23	0
		36 RB	0	2503.5	39725	21.07	22	0-1
				2548.3	40173	21.41	22	0-1
				2593	40620	21.37	22	0-1
				2637.8	41068	21.49	22	0-1
				2682.5	41515	21.37	22	0-1
			18	2503.5	39725	21.16	22	0-1
				2548.3	40173	21.42	22	0-1
				2593	40620	21.45	22	0-1
				2637.8	41068	21.43	22	0-1
				2682.5	41515	21.38	22	0-1
			37	2503.5	39725	21.18	22	0-1
				2548.3	40173	21.34	22	0-1
				2593	40620	21.51	22	0-1
				2637.8	41068	21.39	22	0-1
				2682.5	41515	21.39	22	0-1
		75RB		2503.5	39725	21.10	22	0-1
				2548.3	40173	21.39	22	0-1
				2593	40620	21.40	22	0-1
				2637.8	41068	21.38	22	0-1
				2682.5	41515	21.37	22	0-1

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	16-QAM	1 RB	0	2503.5	39725	21.03	22	0-1
				2548.3	40173	21.30	22	0-1
				2593	40620	21.09	22	0-1
				2637.8	41068	21.32	22	0-1
				2682.5	41515	21.16	22	0-1
			36	2503.5	39725	21.07	22	0-1
				2548.3	40173	21.20	22	0-1
				2593	40620	21.29	22	0-1
				2637.8	41068	21.23	22	0-1
				2682.5	41515	21.11	22	0-1
			74	2503.5	39725	21.08	22	0-1
				2548.3	40173	21.11	22	0-1
				2593	40620	21.44	22	0-1
				2637.8	41068	21.12	22	0-1
				2682.5	41515	21.15	22	0-1
		36 RB	0	2503.5	39725	20.12	21	0-2
				2548.3	40173	20.49	21	0-2
				2593	40620	20.48	21	0-2
				2637.8	41068	20.55	21	0-2
				2682.5	41515	20.42	21	0-2
			18	2503.5	39725	20.19	21	0-2
				2548.3	40173	20.49	21	0-2
				2593	40620	20.54	21	0-2
				2637.8	41068	20.47	21	0-2
				2682.5	41515	20.41	21	0-2
			37	2503.5	39725	20.22	21	0-2
				2548.3	40173	20.42	21	0-2
				2593	40620	20.60	21	0-2
				2637.8	41068	20.45	21	0-2
				2682.5	41515	20.45	21	0-2
		75RB		2503.5	39725	20.17	21	0-2
				2548.3	40173	20.44	21	0-2
				2593	40620	20.46	21	0-2
				2637.8	41068	20.40	21	0-2
				2682.5	41515	20.33	21	0-2

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	2501	39700	22.08	23	0
				2547	40160	22.56	23	0
				2593	40620	22.44	23	0
				2639	41080	22.57	23	0
				2685	41540	22.43	23	0
			25	2501	39700	22.08	23	0
				2547	40160	22.42	23	0
				2593	40620	22.50	23	0
				2639	41080	22.44	23	0
				2685	41540	22.42	23	0
			49	2501	39700	22.18	23	0
				2547	40160	22.39	23	0
				2593	40620	22.58	23	0
				2639	41080	22.43	23	0
				2685	41540	22.47	23	0
		25 RB	0	2501	39700	21.10	22	0-1
				2547	40160	21.50	22	0-1
				2593	40620	21.45	22	0-1
				2639	41080	21.49	22	0-1
				2685	41540	21.44	22	0-1
			12	2501	39700	21.17	22	0-1
				2547	40160	21.49	22	0-1
				2593	40620	21.49	22	0-1
				2639	41080	21.49	22	0-1
				2685	41540	21.43	22	0-1
			25	2501	39700	21.15	22	0-1
				2547	40160	21.42	22	0-1
				2593	40620	21.58	22	0-1
				2639	41080	21.49	22	0-1
				2685	41540	21.45	22	0-1
		50RB		2501	39700	21.16	22	0-1
				2547	40160	21.50	22	0-1
				2593	40620	21.49	22	0-1
				2639	41080	21.46	22	0-1
				2685	41540	21.43	22	0-1

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	16-QAM	1 RB	0	2501	39700	21.03	22	0-1
				2547	40160	21.35	22	0-1
				2593	40620	21.22	22	0-1
				2639	41080	21.41	22	0-1
				2685	41540	21.23	22	0-1
			25	2501	39700	21.02	22	0-1
				2547	40160	21.26	22	0-1
				2593	40620	21.28	22	0-1
				2639	41080	21.27	22	0-1
				2685	41540	21.21	22	0-1
			49	2501	39700	21.05	22	0-1
				2547	40160	21.21	22	0-1
				2593	40620	21.36	22	0-1
				2639	41080	21.22	22	0-1
				2685	41540	21.25	22	0-1
		25 RB	0	2501	39700	20.21	21	0-2
				2547	40160	20.60	21	0-2
				2593	40620	20.54	21	0-2
				2639	41080	20.63	21	0-2
				2685	41540	20.52	21	0-2
			12	2501	39700	20.24	21	0-2
				2547	40160	20.58	21	0-2
				2593	40620	20.58	21	0-2
				2639	41080	20.58	21	0-2
				2685	41540	20.52	21	0-2
			25	2501	39700	20.23	21	0-2
				2547	40160	20.49	21	0-2
				2593	40620	20.67	21	0-2
				2639	41080	20.56	21	0-2
				2685	41540	20.55	21	0-2
		50RB		2501	39700	20.16	21	0-2
				2547	40160	20.49	21	0-2
				2593	40620	20.47	21	0-2
				2639	41080	20.45	21	0-2
				2685	41540	20.42	21	0-2

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	2498.5	39675	22.11	23	0
				2547.8	40148	22.46	23	0
				2593	40620	22.44	23	0
				2640.3	41093	22.47	23	0
				2687.5	41565	22.36	23	0
			12	2498.5	39675	22.06	23	0
				2547.8	40148	22.42	23	0
				2593	40620	22.39	23	0
				2640.3	41093	22.43	23	0
				2687.5	41565	22.35	23	0
			24	2498.5	39675	22.07	23	0
				2547.8	40148	22.36	23	0
				2593	40620	22.49	23	0
				2640.3	41093	22.34	23	0
				2687.5	41565	22.39	23	0
		12 RB	0	2498.5	39675	21.08	22	0-1
				2547.8	40148	21.45	22	0-1
				2593	40620	21.44	22	0-1
				2640.3	41093	21.45	22	0-1
				2687.5	41565	21.43	22	0-1
			6	2498.5	39675	21.05	22	0-1
				2547.8	40148	21.43	22	0-1
				2593	40620	21.43	22	0-1
				2640.3	41093	21.44	22	0-1
				2687.5	41565	21.41	22	0-1
			13	2498.5	39675	21.05	22	0-1
				2547.8	40148	21.44	22	0-1
				2593	40620	21.48	22	0-1
				2640.3	41093	21.43	22	0-1
				2687.5	41565	21.40	22	0-1
		25RB		2498.5	39675	21.05	22	0-1
				2547.8	40148	21.45	22	0-1
				2593	40620	21.47	22	0-1
				2640.3	41093	21.41	22	0-1
				2687.5	41565	21.41	22	0-1

TDD Band 41								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	16-QAM	1 RB	0	2498.5	39675	21.02	22	0-1
				2547.8	40148	21.21	22	0-1
				2593	40620	21.26	22	0-1
				2640.3	41093	21.23	22	0-1
				2687.5	41565	21.16	22	0-1
			12	2498.5	39675	21.06	22	0-1
				2547.8	40148	21.19	22	0-1
				2593	40620	21.21	22	0-1
				2640.3	41093	21.17	22	0-1
				2687.5	41565	21.15	22	0-1
			24	2498.5	39675	21.03	22	0-1
				2547.8	40148	21.18	22	0-1
				2593	40620	21.35	22	0-1
				2640.3	41093	21.15	22	0-1
				2687.5	41565	21.17	22	0-1
		12 RB	0	2498.5	39675	20.20	21	0-2
				2547.8	40148	20.53	21	0-2
				2593	40620	20.58	21	0-2
				2640.3	41093	20.55	21	0-2
				2687.5	41565	20.50	21	0-2
			6	2498.5	39675	20.18	21	0-2
				2547.8	40148	20.51	21	0-2
				2593	40620	20.58	21	0-2
				2640.3	41093	20.52	21	0-2
				2687.5	41565	20.51	21	0-2
			13	2498.5	39675	20.19	21	0-2
				2547.8	40148	20.51	21	0-2
				2593	40620	20.61	21	0-2
				2640.3	41093	20.52	21	0-2
				2687.5	41565	20.50	21	0-2
		25RB		2498.5	39675	20.18	21	0-2
				2547.8	40148	20.50	21	0-2
				2593	40620	20.56	21	0-2
				2640.3	41093	20.49	21	0-2
				2687.5	41565	20.48	21	0-2

1.3.1 LTE Downlink CA specification

LTE Downlink 2CA conducted power table

Two Component Carrier Maximum Conducted Power																
PCC									SCC 1				Power		Configurations	Maximum power
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC (UL) RB	PCC (UL) RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power with DL CA active (dBm)	LTE Tx.Power with DL CA inactive (dBm)		
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B1	20	300	2140	22.98	23.07	CA_1A-5A	Full power
LTE B26	15	26765	821.5	QPSK	1	0	8765	866.5	LTE B1	20	300	2140	22.38	22.42	CA_1A-26A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B17	10	5790	740	22.81	22.91	CA_2A-17A	Full power
LTE B17	10	23780	709	QPSK	1	0	5780	739	LTE B2	20	900	1960	22.39	22.40	CA_2A-17A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B30	10	9820	2355	22.74	22.91	CA_2A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1960	22.40	22.47	CA_2A-30A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B3	20	1575	1842.5	23.00	23.07	CA_3A-5A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B13	10	5230	751	22.61	22.81	CA_4A-13A	Full power
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B4	20	2175	2132.5	22.44	22.59	CA_4A-13A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B17	10	5790	740	22.62	22.81	CA_4A-17A	Full power
LTE B17	10	23780	709	QPSK	1	0	5780	739	LTE B4	20	2175	2132.5	22.26	22.40	CA_4A-17A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B30	10	9820	2355	22.79	22.81	CA_4A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B4	20	2175	2132.5	22.36	22.47	CA_4A-30A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B7	20	3100	2655	23.01	23.07	CA_5A-7A	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B5	10	2525	881.5	22.00	22.16	CA_5A-7A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B30	10	9820	2355	22.99	23.07	CA_5A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B5	10	2525	881.5	22.33	22.47	CA_5A-30A	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B20	20	6300	806	22.02	22.16	CA_7A-20A	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B28	20	9460	783	22.07	22.16	CA_7A-28A	Full power
LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B30	10	9820	2355	22.12	22.30	CA_12A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B12	10	5095	737.5	22.44	22.47	CA_12A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B29	10	9715	722.5	22.44	22.47	CA_29A-30A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	898	1959.8	22.82	22.91	CA_2C	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	1100	1980	22.71	22.91	CA_2A-2A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2145	22.66	22.81	CA_4A-4A	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	20	3048	2649.8	22.00	22.16	CA_7C	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	20	3350	2680	22.13	22.16	CA_7A-7A	Full power
LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	39948	2525.8	22.05	22.14	CA_41C	Full power
LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	41490	2680	22.08	22.14	CA_41A-41A	Full power

LTE Downlink 3CA conducted power table

Three Component Carrier Maximum Conducted Power																			
PCC									SCC 1				SCC 2				Power			
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC (UL) RB	PCC (UL) RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power with DL CA active (dBm)	LTE Tx.Power with DL CA inactive (dBm)	Configurations	Maximum power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B1	20	300	2140	LTE B3	20	1575	1842.5	22.01	22.16	CA_1A-3A-7A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	22.75	22.91	CA_2A-4A-5A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B5	10	2525	881.5	22.71	22.81	CA_2A-4A-5A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.03	23.07	CA_2A-4A-5A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B4	20	2175	2132.5	LTE B13	10	5230	751	22.76	22.91	CA_2A-4A-13A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B13	10	5230	751	22.75	22.81	CA_2A-4A-13A	Full power
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	22.43	22.59	CA_2A-4A-13A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	22.82	22.91	CA_2A-5A-30A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B2	20	900	1960	LTE B30	10	9820	2355	22.98	23.07	CA_2A-5A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	22.37	22.47	CA_2A-5A-30A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	22.79	22.91	CA_2A-5A-66A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B2	20	900	1960	LTE B66	20	66786	2145	22.89	23.07	CA_2A-5A-66A	Full power
LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B5	10	2525	881.5	22.30	22.47	CA_2A-5A-66A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	22.83	22.91	CA_2A-12A-30A	Full power
LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	22.24	22.40	CA_2A-12A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B12	10	5095	737.5	LTE B2	20	900	1960	22.37	22.47	CA_2A-12A-30A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B13	10	5230	751	LTE B66	20	66786	2145	22.78	22.91	CA_2A-13A-66A	Full power
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B66	20	66786	2145	22.41	22.59	CA_2A-13A-66A	Full power
LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B13	10	5230	751	22.28	22.47	CA_2A-13A-66A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	22.83	22.91	CA_2A-29A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1960	LTE B29	10	9715	722.5	22.34	22.47	CA_2A-29A-30A	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B3	20	1575	1842.5	LTE B20	20	6300	806	22.00	22.16	CA_3A-7A-20A	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B3	20	1575	1842.5	LTE B28	20	9460	783	22.10	22.16	CA_3A-7A-28A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	22.70	22.81	CA_4A-5A-30A	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	23.01	23.07	CA_4A-5A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	22.32	22.47	CA_4A-5A-30A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	22.64	22.81	CA_4A-12A-30A	Full power
LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	22.27	22.40	CA_4A-12A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	22.40	22.47	CA_4A-12A-30A	Full power
LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	22.80	22.81	CA_4A-29A-30A	Full power
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	22.38	22.47	CA_4A-29A-30A	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B66	10	66837	2150.1	LTE B66	10	66936	2160	22.89	22.91	CA_2A-66B	Full power
LTE B66	15	132047	1717.5	QPSK	1	0	66511	2117.5	LTE B66	5	66604	2126.8	LTE B2	20	900	1960	22.53	22.54	CA_2A-66B	Full power
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B66	20	66536	2120	LTE B66	10	66680	2134.4	22.81	22.91	CA_2A-66C	Full power
LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B2	20	900	1960	22.41	22.47	CA_2A-66C	Full power
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	20	3048	2649.8	LTE B3	20	1575	1842.5	22.15	22.16	CA_3A-7C	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B66	10	66837	2150.1	LTE B66	10	66936	2160	23.02	23.07	CA_5A-66B	Full power
LTE B66	15	132047	1717.5	QPSK	1	0	66511	2117.5	LTE B66	5	66604	2126.8	LTE B5	10	2525	881.5	22.36	22.54	CA_5A-66B	Full power
LTE B5	10	20450	829	QPSK	1	0	2450	874	LTE B66	20	66536	2120	LTE B66	10	66680	2134.4	23.05	23.07	CA_5A-66C	Full power
LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B5	10	2525	881.5	22.40	22.47	CA_5A-66C	Full power
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B66	10	66837	2150.1	LTE B66	10	66936	2160	22.55	22.59	CA_13A-66B	Full power
LTE B66	15	132047	1717.5	QPSK	1	0	66511	2117.5	LTE B66	5	66604	2126.8	LTE B13	10	5230	751	22.37	22.54	CA_13A-66B	Full power
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B66	20	66536	2120	LTE B66	10	66680	2134.4	22.58	22.59	CA_13A-66C	Full power
LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B13	10	5230	751	22.43	22.47	CA_13A-66C	Full power
LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B66	20	66932	2159.6	22.46	22.47	CA_66D	Full power

LTE CA information

A)

The device supports downlink LTE Carrier Aggregation (CA) only. It supports a maximum of 3 carriers in the downlink. Other Release 10 features or higher features are not supported, including Uplink Carrier Aggregation, Enhanced SC-FDMA and Uplink MIMO or other antenna diversity configurations etc. All uplink communications are identical to the Release 8 Specifications.

The possible downlink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.521-1 V14.3.0. The conducted power measurement results of downlink LTE CA are provided as above per 3GPP TS 36.521-1 V14.3.0. According to KDB 941225 D05A and RF exposure procedures in TCB workshop April 2018, the downlink LTE CA SAR test is not required.

B)

CA combination table

Index	2CC	Restriction	Completely Covered by Measurement	Index	3CC	Restriction	Completely Covered by Measurement
2CC #1	CA 2C		3CC #3	3CC #1	CA 2A-4A-5A		No
2CC #2	CA 2A-2A		No	3CC #2	CA 2A-4A-13A		No
2CC #3	CA 2A-4A		3CC #1	3CC #3	CA 2C-5A		No
2CC #4	CA 2A-5A		3CC #4	3CC #4	CA 2A-5A-30A		No
2CC #5	CA 2A-12A		3CC #6	3CC #5	CA 2A-5A-66A		No
2CC #6	CA 2A-13A		3CC #7	3CC #6	CA 2A-12A-30A		No
2CC #7	CA 2A-17A		No	3CC #7	CA 2A-13A-66A		No
2CC #8	CA 2A-29A	B29 SCC only	3CC #8	3CC #8	CA 2A-29A-30A	B29 SCC only	No
2CC #9	CA 2A-30A		3CC #4	3CC #9	CA 2A-66B		No
2CC #10	CA 2A-66A		3CC #5	3CC #10	CA 2A-66C		No
2CC #11	CA 4A-4A		No	3CC #11	CA 4A-5A-30A		No
2CC #12	CA 4A-5A		3CC #11	3CC #12	CA 4A-12A-30A		No
2CC #13	CA 4A-12A		3CC #12	3CC #13	CA 4A-29A-30A	B29 SCC only	No
2CC #14	CA 4A-13A		3CC #2	3CC #14	CA 5A-66B		No
2CC #15	CA 4A-17A		No	3CC #15	CA 5A-66C		No
2CC #16	CA 4A-29A	B29 SCC only	3CC #13	3CC #16	CA 66D		No
2CC #17	CA 4A-30A		3CC #11	3CC #17	CA 13A-66B		No
2CC #18	CA 5A-7A		No	3CC #18	CA 13A-66C		No
2CC #19	CA 5A-30A		3CC #4				
2CC #20	CA 5A-66A		3CC #5				
2CC #21	CA-7B		No				
2CC #22	CA-7C		No				
2CC #23	CA-7A-7A		No				
2CC #24	CA 12A-30A		3CC #6				
2CC #25	CA 13A-66A		3CC #7				
2CC #26	CA 29A-30A		3CC #8				
2CC #27	CA 41C		No				
2CC #28	CA 41A-41A		No				
2CC #29	CA 66B		3CC #9				
2CC #30	CA 66C		3CC #10				
2CC #31	CA 66A-66A		No				

Table 1: intra-band contiguous CA

E-UTRA CA configuration	Component carriers in order of increasing carrier frequency			Maximum aggregated bandwidth [MHz]	Bandwidth combination set
	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_2C	5	20		40	0
	10	15,20			
	15	10,15,20			
	20	5,10,15,20			
CA_7B	15	5		20	0
CA_7C	15	15		40	0
	20	20			
	10	20		40	1
	15	15,20			
	20	10,15,20			
	15	10,15		40	2
	20	15,20			
CA_41C	10	20		40	0
	15	15,20			
	20	10,15,20			
	5,10	20		40	1
	15	15,20			
	20	5,10,15,20			
	10	15,20		40	2
	15	10,15,20			
	20	10,15,20			
	10	20		40	3
	20	20			
CA_66D	5	20	20	60	0

	20	5	20		
	20	20	5		
	10	20	15		
	15	20	10		
	10,15,20	15,20	20		
	15,20	10	20		
	15	15,20	15		
	20	15,20	10,15		
	20	10	15		

Table 2: intra-band non-contiguous CA (with two sub-blocks)

-UTRACA configuration	Component carriers in order of increasing carrier frequency			Maximum aggregated bandwidth [MHz]	Bandwidth combination set
	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_2A-2A	5,10,15,20	5,10,15,20		40	0
CA_4A-4A	5,10,15,20	5,10,15,20		40	0
	5,10	5,10		20	1
CA_7A-7A	5	15		40	0
	10	10,15			
	15	15,20			
	20	20			
	5,10,15,20	5,10,15,20		40	1
	5,10,15,20	5,10		30	2
	10,15,20	10,15,20		40	3
CA_41A-41A	10,15,20	10,15,20		40	0
	5,10,15,20	5,10,15,20		40	1

Table 3: inter-band CA (two bands)

E-UTRA CA Configuration	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-4A	2	Yes	Yes	Yes	Yes	Yes	Yes	40	0
	4			Yes	Yes	Yes	Yes		
	2			Yes	Yes			20	1
	4			Yes	Yes				
	2			Yes	Yes	Yes	Yes	40	2
	4			Yes	Yes	Yes	Yes		
CA_2A-5A	2			Yes	Yes	Yes	Yes	30	0
	5			Yes	Yes				
	2			Yes	Yes			20	1
	5			Yes	Yes				
CA_2C-5A	2	See CA_2C bandwidth combination set 0 in 3GPP TS 36,521-1 table 5.4.2A. 1-3						50	0
	5			Yes	Yes				
CA_2A-12A	2			Yes	Yes	Yes	Yes	30	0
	12			Yes	Yes				
	2			Yes	Yes	Yes	Yes	30	1
	12		Yes	Yes	Yes				
	2			Yes	Yes			20	2
	12			Yes	Yes				
CA_2A-13A	2			Yes	Yes	Yes	Yes	30	0
	13				Yes				
	2			Yes	Yes			20	1
	13				Yes				
CA_2A-17A	2			Yes	Yes			20	0
	17			Yes	Yes				
CA_2A-29A	2			Yes	Yes			20	0

	29		Yes	Yes	Yes				
	2			Yes	Yes			20	1
	29			Yes	Yes				
	2			Yes	Yes	Yes	Yes	30	2
	29			Yes	Yes				
CA_2A-30A	2			Yes	Yes	Yes	Yes	30	0
	30			Yes	Yes				
CA_2A-66A	2	Yes	Yes	Yes	Yes	Yes	Yes	40	0
	66			Yes	Yes	Yes	Yes		
	2			Yes	Yes			20	1
	66			Yes	Yes				
	2			Yes	Yes	Yes	Yes	40	2
	66			Yes	Yes	Yes	Yes		
CA_2A-66B	2			Yes	Yes	Yes	Yes	40	0
	66	See CA_66B bandwidth combination set 0 in 3GPP TS 36,521-1 table 5.4.2A. 1-1							
CA_2A-66C	2			Yes	Yes	Yes	Yes	60	0
	66	See CA_66C bandwidth combination set 0 in 3GPP TS 36,521-1 table 5.4.2A. 1-1							
CA_4A-5A	4			Yes	Yes			20	0
	5			Yes	Yes				
	4			Yes	Yes	Yes	Yes	30	1
	5			Yes	Yes				
CA_4A-12A	4	Yes	Yes	Yes	Yes			20	0
	12			Yes	Yes				
	4	Yes	Yes	Yes	Yes	Yes	Yes	30	1
	12			Yes	Yes				
	4			Yes	Yes	Yes	Yes	30	2
	12		Yes	Yes	Yes				
	4			Yes	Yes			20	3
	12			Yes	Yes				

	4			Yes	Yes	Yes	Yes	30	4
	12			Yes	Yes				
	4			Yes	Yes	Yes		20	5
	12			Yes					
CA_4A-13A	4			Yes	Yes	Yes	Yes	30	0
	13				Yes				
	4			Yes	Yes			20	1
	13				Yes				
CA_4A-29A	4			Yes	Yes			20	0
	29		Yes	Yes	Yes				
	4			Yes	Yes			20	1
	29			Yes	Yes				
	4			Yes	Yes	Yes	Yes	30	2
	29			Yes	Yes				
CA_4A-30A	4			Yes	Yes	Yes	Yes	30	0
	30			Yes	Yes				
CA_5A-7A	5	Yes	Yes	Yes	Yes			30	0
	7				Yes	Yes	Yes		
	5			Yes	Yes			30	1
	7				Yes	Yes	Yes		
CA_5A-30A	5			Yes	Yes			20	0
	30			Yes	Yes				
CA_5A-66A	5			Yes	Yes			30	0
	66			Yes	Yes	Yes	Yes		
CA_5A-66B	5			Yes	Yes			30	0
	66	See CA_66B bandwidth combination set 2 in 3GPP TS 36,521-1 table 5.4.2A. 1-1							
CA_5A-66C	5			Yes	Yes			50	0
	66	See CA_66C bandwidth combination set 2 in 3GPP TS 36,521-1 table 5.4.2A. 1-1							
CA_12A-30A	12			Yes	Yes			20	0

	30			Yes	Yes				
CA_13A-66A	13			Yes	Yes			30	0
	66			Yes	Yes	Yes	Yes		
CA_13A-66B	13			Yes	Yes			30	0
	66	See CA_66B bandwidth combination set 0 in 3GPP TS 36,521-1 table 5.4.2A. 1-1							
CA_13A-66C	13			Yes	Yes			50	0
	66	See CA_66C bandwidth combination set 0 in 3GPP TS 36,521-1 table 5.4.2A. 1-1							
CA_29A-30A	29			Yes	Yes			20	0
	30			Yes	Yes				

Table 4: inter-band CA (three bands)

E-UTRA CA Configuration	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-4A-5A	2			Yes	Yes	Yes	Yes	50	0
	4			Yes	Yes	Yes	Yes		
	5			Yes	Yes				
CA_2A-4A-13A	2			Yes	Yes	Yes	Yes	50	0
	4			Yes	Yes	Yes	Yes		
	13				Yes				
CA_2A-5A-30A	2			Yes	Yes	Yes	Yes	40	0
	5			Yes	Yes				
	30			Yes	Yes				
CA_2A-5A-66A	2			Yes	Yes	Yes	Yes	50	0
	5			Yes	Yes				
	66			Yes	Yes	Yes	Yes		
CA_2A-12A-30A	2			Yes	Yes	Yes	Yes	40	0
	12			Yes	Yes				

	30			Yes	Yes				
CA_2A-13A-66A	2			Yes	Yes	Yes	Yes	50	0
	13			Yes	Yes				
	66			Yes	Yes	Yes	Yes		
CA_2A-29A-30A	2			Yes	Yes	Yes	Yes	40	0
	29			Yes	Yes				
	30			Yes	Yes				
CA_4A-5A-30A	4			Yes	Yes	Yes	Yes	40	0
	5			Yes	Yes				
	30			Yes	Yes				
CA_4A-12A-30A	4			Yes	Yes	Yes	Yes	40	0
	12			Yes	Yes				
	30			Yes	Yes				
CA_4A-29A-30A	4			Yes	Yes	Yes	Yes	40	0
	29			Yes	Yes				
	30			Yes	Yes				

Note:

1）For the inter-band CA combinations, except B29 can't be PCC, all the listed bands above can be used as PCC or SCC.

2) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.521-1 V14.3.0.

3) The reference test frequencies for CA refers to 3GPP TS 36.508 V14.2.0

4) Testing is not required in bands or modes not intended/allowed for US operation

5) Based on TCB workshop April 2018, only indicate "No" in CA combination table need power measurement

1.4 Test Environment

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

1.5 Operation Description

The EUT is controlled by using a Radio Communication Tester, and the communication between the EUT and the tester is established by air link.

EUT was tested as below

Laptop mode

SAR measurement for laptop mode is performed with keyboard bottom touch against the flat phantom.

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). The following 4 sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

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

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

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). The following 5 sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

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

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

4. The 3G SAR test reduction procedure is applied to HSPA+ 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+). The following 1 sub-test was completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Table C.11.1.4: **β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

Sub-test	β_c *(Note3)*	β_d	β_{HS} *(Note1)*	β_{ec}	β_{ed} *(2xSF2)* *(Note 4)*	β_{ed} *(2xSF4)* *(Note 4)*	CM *(dB)* *(Note 2)*	MPR *(dB)* *(Note 2)*	*AG Index* *(Note 4)*	*E-TFCI* *(Note 5)*	*E-TFCI* *(boost)*
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

5. The 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable. Since the maximum output power in a secondary mode (DC-HSDPA) is ≤ ¼ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (DC-HSDPA). The following tests were

completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these setting are illustrated below:

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

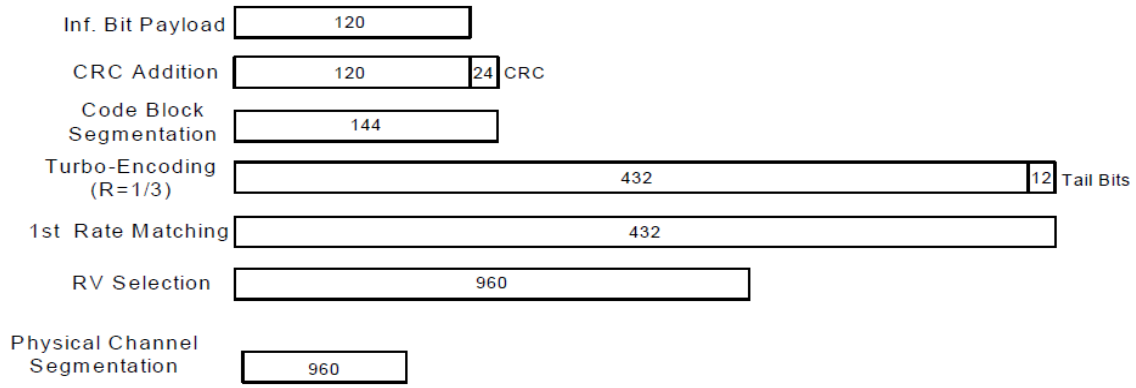


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

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

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

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

a. Per Section 5.2.1, the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation.

- Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
- When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

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

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

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

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

tested.

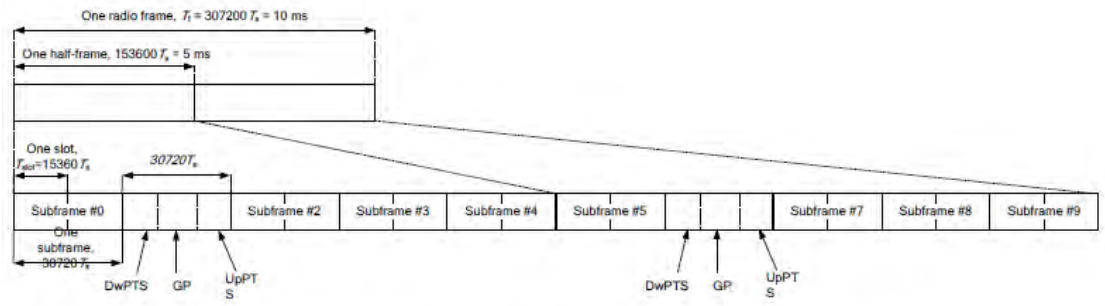
d. Per Section 5.2.4, Higher order modulations

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

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

- For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.
- TDD LTE was tested at highest duty factor using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 7. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.

According to KDB 941225 D05, SAR testing for TDD LTE must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be tabulated as below.



3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2

Special Subframe Configuration	Normal Cyclic Prefix in Downlink			Extended Cyclic Prefix in Downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts
1	19760 · Ts			20480 · Ts		
2	21952 · Ts			23040 · Ts		
3	24144 · Ts			25600 · Ts		
4	26336 · Ts			7680 · Ts	4384 · Ts	5120 · Ts
5	6592 · Ts	4384 · Ts	5120 · Ts	20480 · Ts		
6	19760 · Ts			23040 · Ts		
7	21952 · Ts			12800 · Ts		
8	24144 · Ts			-	-	-
9	13168 · Ts			-	-	-

3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The uplink duty cycle of these seven configurations can be computed as below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Considering the highest transmission duty cycle, TDD LTE was tested using Uplink-Downlink configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using extended cyclic prefix uplink. Therefore, SAR testing for TDD LTE was measured at the maximum output power with highest transmission duty cycle of 63.33%.

LTE downlink CA (KDB942225 D05A)

7. The device supports a maximum of 3 carriers in the downlink. All uplink communications are identical to the Release 8 specifications. Uplink maximum output power is measured with downlink carrier aggregation active, only for the channel with highest measured maximum output power when downlink carrier aggregation is inactive, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

8. The downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements. The nominal channel spacing is determined by [BW1 + BW2 – 0.1*|BW1 – BW2|]/2 MHz, where BW1 and BW2 are the channel bandwidths of the CC in a 2-CC aggregation configuration.

9. The downlink PCC channel should be paired with the uplink channel according to normal configurations, as if there is no carrier aggregation. The downlink SCC should be adjacent to the PCC and remain within the downlink transmission band for contiguous intra-band CA. For non-contiguous intra-band CA, the SCC should be selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band. For inter-band CA, the SCC should be near the middle of its transmission band.

10. When downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive, so SAR evaluation is not required for downlink carrier aggregation.

11. According to KDB447498D01v06, SAR test exclusion evaluation for

surfaces/edges of tablet mode 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)

Mode		WLAN Main 2.45GHz	WLAN Main 5GHz	BT
Max. tune-up power(dBm)		21	21.5	10.5
Max. tune-up power(mW)		125.893	141.254	11.220
Bottom side	Test separation distance	54.5	54.5	54.5
	Calculation value	48.951	51.818	45.353
	Require SAR testing?	NO	NO	NO

Mode		WLAN Aux 2.45GHz	WLAN Aux 5GHz
Max. tune-up power(dBm)		21	21.5
Max. tune-up power(mW)		125.893	141.254
Bottom side	Test separation distance	114.5	114.5
	Calculation value	648.951	651.818
	Require SAR testing?	NO	NO

1.6 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.

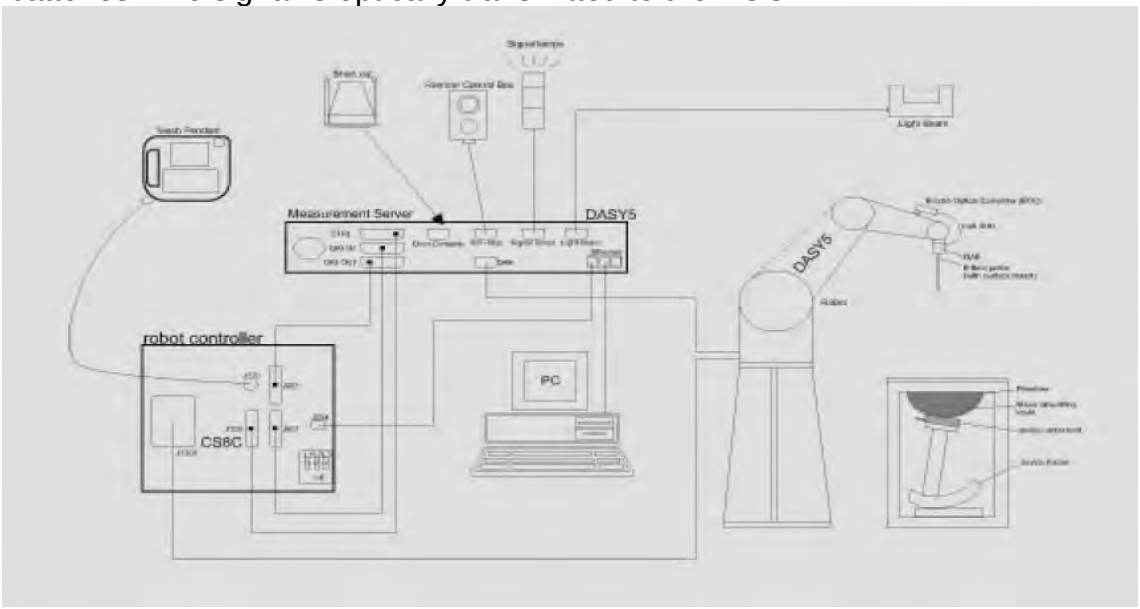


Fig. a The block diagram of SAR system

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. Tissue simulating liquid mixed according to the given recipes.
11. Validation dipole kits allowing to validate the proper functioning of the system.

1.7 System Components

EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 750/835/1750/1900/2300/2600 MHz 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%.	

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

1.8 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 750/835/1750/1900/2300/ 2600MHz. 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 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.

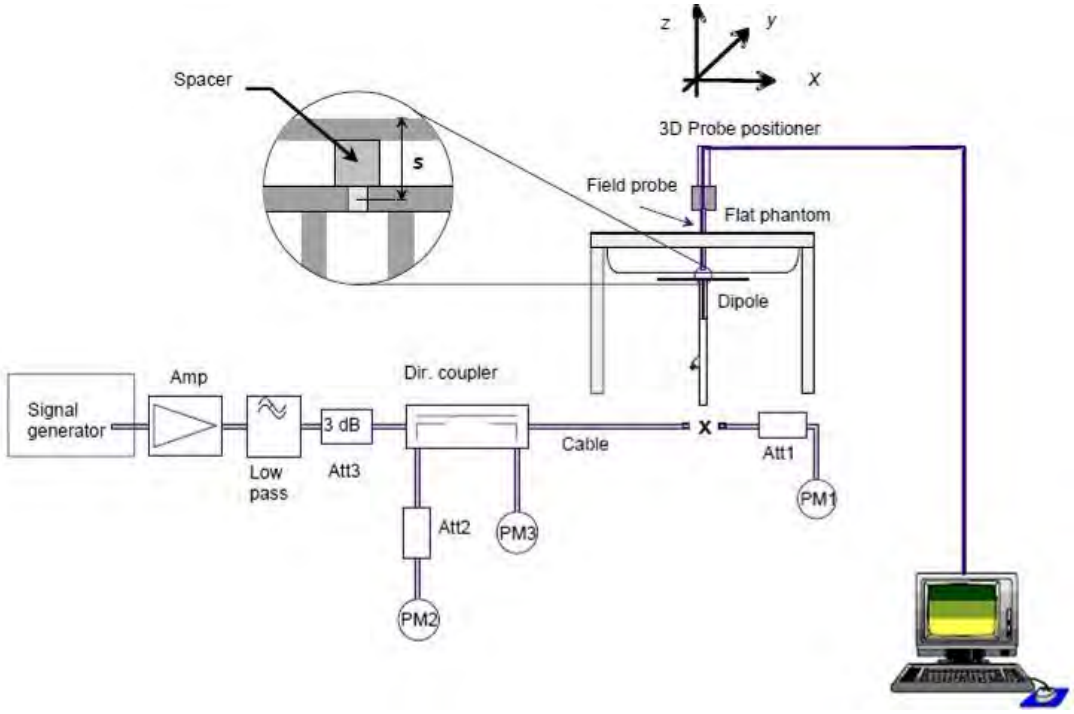


Fig. b The block diagram of system verification

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	1015	750	Body	8.62	2.16	8.64	0.23%	Sep. 17, 2018
D835V2	4d036	835	Body	9.58	2.43	9.72	1.46%	Sep. 18, 2018
D1750V2	1008	1750	Body	37	8.89	35.56	-3.89%	Sep. 19, 2018
D1900V2	5d173	1900	Body	40.9	10.00	40.00	-2.20%	Sep. 19, 2018
D2300V2	1023	2300	Body	47.7	11.6	46.40	-2.73%	Sep. 20, 2018
D2600V2	1005	2600	Body	54.4	14.6	58.40	7.35%	Sep. 21, 2018

Table 1. Results of system verification

1.9 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.

The depth of the tissue simulant in the flat section of the phantom was ≥ 15 cm ± 5 mm (Frequency ≤3G) or ≥ 10 cm ± 5 mm (Frequency >3G) during all tests. (Fig. 2)

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	Sep, 17. 2018	704.00	55.710	0.960	57.749	0.923	-3.66%	3.83%
		707.50	55.697	0.960	57.731	0.928	-3.65%	3.34%
		709.00	55.691	0.960	57.717	0.931	-3.64%	3.04%
		710.00	55.687	0.960	57.704	0.934	-3.62%	2.73%
		711.00	55.683	0.960	57.572	0.935	-3.39%	2.64%
		750.00	55.531	0.963	57.292	0.975	-3.17%	-1.21%
		782.00	55.406	0.966	57.087	1.006	-3.03%	-4.15%
	Sep, 18. 2018	821.50	55.253	0.969	57.495	0.984	-4.06%	-1.55%
		826.40	55.226	0.959	57.473	0.985	-4.07%	-2.67%
		829.00	55.218	0.963	57.412	0.992	-3.97%	-3.05%
		831.50	55.214	0.970	57.409	0.993	-3.98%	-2.40%
		835.00	55.200	0.970	57.385	0.994	-3.96%	-2.47%
		836.50	55.195	0.972	57.401	0.995	-4.00%	-2.38%
		836.60	55.194	0.970	57.412	0.996	-4.02%	-2.67%
		841.50	55.180	0.978	57.342	0.999	-3.92%	-2.15%
		844.00	55.172	0.981	57.377	1.002	-4.00%	-2.13%
		846.60	55.164	0.984	57.248	1.005	-3.78%	-2.11%
	Sep, 19. 2018	1712.40	53.531	1.465	51.398	1.394	3.98%	4.83%
		1720.00	53.511	1.469	51.373	1.404	3.99%	4.46%
		1732.40	53.478	1.477	51.323	1.414	4.03%	4.29%
		1732.50	53.478	1.477	51.322	1.415	4.03%	4.22%
		1745.00	53.445	1.485	51.338	1.426	3.94%	3.99%
		1750.00	53.432	1.488	51.275	1.432	4.04%	3.79%
		1752.60	53.425	1.490	51.263	1.436	4.05%	3.63%
		1770.00	53.379	1.501	51.212	1.452	4.06%	3.27%
		1852.40	53.162	1.553	50.924	1.531	4.21%	1.42%
		1860.00	53.142	1.558	50.873	1.536	4.27%	1.41%
		1880.00	53.089	1.571	50.823	1.559	4.27%	0.73%
		1900.00	53.037	1.583	50.772	1.574	4.27%	0.58%
		1907.60	53.017	1.588	50.733	1.585	4.31%	0.19%
	Sep, 20. 2018	2300.00	52.900	1.807	53.572	1.865	-1.27%	-3.23%
		2310.00	52.887	1.816	53.545	1.877	-1.24%	-3.35%
	Sep, 21. 2018	2506.00	52.629	2.029	52.871	2.092	-0.46%	-3.08%
		2510.00	52.624	2.035	52.875	2.098	-0.48%	-3.09%
		2535.00	52.592	2.071	52.762	2.136	-0.32%	-3.16%
		2549.50	52.573	2.091	52.756	2.153	-0.35%	-2.96%
		2560.00	52.560	2.106	52.694	2.169	-0.25%	-2.99%
		2580.00	52.535	2.134	52.643	2.194	-0.21%	-2.79%
		2593.00	52.518	2.153	52.671	2.212	-0.29%	-2.75%
		2595.00	52.515	2.156	52.602	2.215	-0.16%	-2.75%
		2600.00	52.509	2.163	52.540	2.227	-0.06%	-2.97%
		2610.00	52.496	2.177	52.543	2.234	-0.09%	-2.62%
		2636.50	52.463	2.214	52.443	2.282	0.04%	-3.05%
		2680.00	52.407	2.276	52.303	2.333	0.20%	-2.50%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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)
835	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)
2300	Body	301.7 g	698.3 g	–	–	–	–	1.0L(Kg)
2600	Body	301.7 g	698.3 g	–	–	–	–	1.0L(Kg)

Table 3. Recipes for Tissue Simulating Liquid

1.10 Evaluation Procedures

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

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

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

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

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

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

1.11 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:

1.11.1 Transfer Calibration with Temperature Probes

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

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

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

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

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].

1.11.2 Calibration with Analytical Fields

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

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

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

References

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

1.12 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.

2. Summary of Results

WCDMA Band II

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
WCDMA Band II	Bottom side	0	9262	1852.4	24.00	23.41	14.55%	0.037	0.042	-
	Bottom side	0	9400	1880	24.00	23.48	12.72%	0.036	0.041	-
	Bottom side	0	9538	1907.6	24.00	23.49	12.46%	0.040	0.045	117

WCDMA Band IV

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 IV	Bottom side	0	1312	1712.4	24.00	23.12	22.46%	0.046	0.057	-
	Bottom side	0	1412	1732.4	24.00	23.19	20.50%	0.048	0.058	118
	Bottom side	0	1513	1752.6	24.00	23.46	13.24%	0.044	0.050	-

WCDMA Band V

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
WCDMA Band V	Bottom side	0	4132	826.4	24.00	23.53	11.43%	0.013	0.014	-
	Bottom side	0	4183	836.6	24.00	23.57	10.41%	0.014	0.015	-
	Bottom side	0	4233	846.6	24.00	23.71	6.91%	0.015	0.016	119

LTE FDD Band 2

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 2	20MHz	QPSK	1 RB	50	Bottom side	0	18700	1860	23	22.96	0.93%	0.037	0.037	-
					Bottom side	0	18900	1880	23	22.99	0.23%	0.042	0.042	120
					Bottom side	0	19100	1900	23	22.97	0.69%	0.039	0.039	-
			50 RB	50	Bottom side	0	18900	1880	22	21.96	0.93%	0.033	0.033	-
			100 RB		Bottom side	0	18900	1880	22	21.99	0.23%	0.027	0.027	-

LTE FDD Band 4

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 4	20MHz	QPSK	1 RB	50	Bottom side	0	20050	1720	23.5	22.82	16.95%	0.048	0.056	121
					Bottom side	0	20175	1732.5	23.5	22.75	18.85%	0.044	0.053	-
					Bottom side	0	20300	1745	23.5	22.89	15.08%	0.040	0.045	-
			50 RB	0	Bottom side	0	20300	1745	22.5	21.97	12.98%	0.040	0.045	-
			100 RB		Bottom side	0	20300	1745	22.5	21.95	13.50%	0.038	0.043	-

LTE FDD Band 5

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 5	10MHz	QPSK	1 RB	25	Bottom side	0	20450	829	23	22.82	4.23%	0.010	0.011	-
					Bottom side	0	20525	836.5	23	22.98	0.46%	0.018	0.018	122
					Bottom side	0	20600	844	23	22.95	1.16%	0.014	0.015	-
			25 RB	12	Bottom side	0	20600	844	22	21.98	0.46%	0.014	0.014	-
			50 RB		Bottom side	0	20525	836.5	22	21.96	0.93%	0.014	0.014	-

LTE FDD Band 7

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 7	20MHz	QPSK	1 RB	99	Bottom side	0	20850	2510	23.5	22.52	25.31%	0.051	0.064	123
					Bottom side	0	21100	2535	23.5	22.61	22.74%	0.042	0.052	-
					Bottom side	0	21350	2560	23.5	22.47	26.77%	0.029	0.037	-
			50 RB	50	Bottom side	0	21100	2535	22.5	21.52	25.31%	0.036	0.045	-
			100 RB		Bottom side	0	21100	2535	22.5	21.61	22.74%	0.040	0.049	-

LTE FDD Band 12

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	49	Bottom side	0	23060	704	23.5	22.50	25.89%	0.038	0.048	124
					Bottom side	0	23095	707.5	23.5	22.44	27.64%	0.035	0.044	-
					Bottom side	0	23130	711	23.5	22.31	31.52%	0.033	0.043	-
			25 RB	25	Bottom side	0	23060	704	22.5	21.49	26.18%	0.031	0.039	-
			50 RB		Bottom side	0	23060	704	22.5	21.49	26.18%	0.033	0.042	-

LTE FDD Band 13

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 13	10MHz	QPSK	1 RB	0	Bottom side	0	23230	782	23.5	22.59	23.31%	0.022	0.027	-
				25	Bottom side	0	23230	782	23.5	22.68	20.78%	0.031	0.038	125
				49	Bottom side	0	23230	782	23.5	22.54	24.74%	0.027	0.033	-
			25 RB	12	Bottom side	0	23230	782	22.5	21.58	23.59%	0.028	0.035	-
			50 RB		Bottom side	0	23230	782	22.5	21.62	22.46%	0.026	0.031	-

LTE FDD Band 17

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 17	10MHz	QPSK	1 RB	49	Bottom side	0	23780	709	23	22.44	13.76%	0.036	0.041	-
					Bottom side	0	23790	710	23	22.61	9.40%	0.039	0.042	126
					Bottom side	0	23800	711	23	22.47	12.98%	0.038	0.043	-
			25 RB	25	Bottom side	0	23790	710	22	21.45	13.50%	0.035	0.040	-
			50 RB		Bottom side	0	23790	710	22	21.50	12.20%	0.033	0.036	-

LTE FDD Band 26

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 26	15MHz	QPSK	1 RB	74	Bottom side	0	26765	821.5	23	22.46	13.24%	0.015	0.017	127
					Bottom side	0	26865	831.5	23	22.47	12.98%	0.014	0.016	-
					Bottom side	0	26965	841.5	23	22.45	13.50%	0.014	0.016	-
			36 RB	37	Bottom side	0	26865	831.5	22	21.64	8.64%	0.013	0.014	-
			75 RB		Bottom side	0	26865	831.5	22	21.75	5.93%	0.012	0.013	-

LTE FDD Band 30

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 30	10MHz	QPSK	1 RB	0	Bottom side	0	27710	2310	23.50	22.47	26.77%	0.049	0.062	-
				25	Bottom side	0	27710	2310	23.50	22.17	35.83%	0.051	0.069	128
				49	Bottom side	0	27710	2310	23.50	22.36	30.02%	0.041	0.053	-
			25 RB	0	Bottom side	0	27710	2310	22.50	21.49	26.18%	0.043	0.054	-
			50 RB		Bottom side	0	27710	2310	22.50	21.35	30.32%	0.041	0.053	-

LTE TDD Band 38

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 38	20MHz	QPSK	1 RB	99	Bottom side	0	37850	2580	23	22.23	19.40%	0.032	0.039	129
					Bottom side	0	38000	2595	23	22.39	15.08%	0.029	0.033	-
					Bottom side	0	38150	2610	23	22.41	14.55%	0.025	0.029	-
			50 RB	50	Bottom side	0	38150	2610	22	21.38	15.35%	0.022	0.025	-
			100 RB		Bottom side	0	38150	2610	22	21.36	15.88%	0.024	0.028	-

LTE TDD Band 41

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 41	20MHz	QPSK	1 RB	99	Bottom side	0	39750	2506	23	22.38	15.35%	0.030	0.034	-
					Bottom side	0	40185	2549.5	23	22.35	16.14%	0.029	0.033	-
					Bottom side	0	40620	2593	23	22.76	5.68%	0.043	0.045	130
					Bottom side	0	41055	2636.5	23	22.61	9.40%	0.039	0.042	-
					Bottom side	0	41490	2680	23	22.48	12.72%	0.033	0.037	-
			50 RB	50	Bottom side	0	40620	2593	22	21.58	10.15%	0.039	0.043	-
			100 RB		Bottom side	0	40620	2593	22	21.51	11.94%	0.035	0.039	-

LTE FDD Band 66

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 66	20MHz	QPSK	1 RB	99	Bottom side	0	132072	1720	23.5	22.50	25.89%	0.043	0.054	-
					Bottom side	0	132322	1745	23.5	22.71	19.95%	0.047	0.056	131
					Bottom side	0	132572	1770	23.5	22.70	20.23%	0.035	0.042	-
			50 RB	50	Bottom side	0	132322	1745	22.5	21.78	18.03%	0.033	0.039	-
			100 RB		Bottom side	0	132322	1745	22.5	21.79	17.76%	0.039	0.046	-

3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

NO.	Simultaneous Transmit Configurations	Body
1	UMTS + 2.4GHz WLAN Main / 2.4GHz WLAN Aux / 2.4GHz MIMO	YES
2	UMTS + 5GHz WLAN Main / 5GHz WLAN Aux / 5GHz MIMO	YES
3	UMTS + BT	YES
4	UMTS + 2.4/5GHz WLAN Aux + BT	YES
5	LTE + 2.4GHz WLAN Main / 2.4GHz WLAN Aux / 2.4GHz MIMO	YES
6	LTE + 5GHz WLAN Main / 5GHz WLAN Aux / 5GHz MIMO	YES
7	LTE + BT	YES
8	LTE + 2.4/5GHz WLAN Aux + BT	YES

Note :
1) WWAN and WLAN may transmit simultaneously.
2) Bluetooth and WLAN Main share the same antenna path.
3) Bluetooth can transmit with WLAN Aux simultaneously.

3.1 Estimated SAR calculation

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

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

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

Mode / Band	position	test separation distance	Estimated SAR(W/kg)
WLAN Main / Aux	Bottom side	>50mm	0.4

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.

WWAN + 2.4GHz WLAN Main

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Main	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.458	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.416	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.442	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.456	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.418	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.464	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.448	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.438	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.443	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.417	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.469	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.439	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.456	ΣSAR<1.6, Not required

WWAN + 2.4GHz WLAN Aux

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Aux	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.458	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.416	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.442	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.456	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.418	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.464	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.448	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.438	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.443	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.417	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.469	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.439	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.456	ΣSAR<1.6, Not required

WWAN + 5GHz WLAN Main

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Main	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.458	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.416	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.442	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.456	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.418	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.464	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.448	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.438	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.443	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.417	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.469	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.439	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.456	ΣSAR<1.6, Not required

WWAN + 5GHz WLAN Aux

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Aux	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.458	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.416	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.442	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.456	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.418	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.464	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.448	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.438	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.443	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.417	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.469	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.439	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.445	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.456	ΣSAR<1.6, Not required

WWAN + 2.4GHz WLAN Aux + BT

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Aux	BT	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.400	0.858	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.400	0.816	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.400	0.842	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.400	0.818	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.400	0.864	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.400	0.848	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.400	0.838	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.400	0.843	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.400	0.817	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.400	0.869	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.400	0.839	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required

WWAN + 5GHz WLAN Aux + BT

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Aux	BT	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.400	0.858	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.400	0.816	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.400	0.842	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.400	0.818	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.400	0.864	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.400	0.848	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.400	0.838	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.400	0.843	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.400	0.817	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.400	0.869	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.400	0.839	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required

WWAN + 2.4GHz WLAN MIMO

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Main	Max. WLAN Aux	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.400	0.858	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.400	0.816	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.400	0.842	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.400	0.818	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.400	0.864	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.400	0.848	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.400	0.838	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.400	0.843	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.400	0.817	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.400	0.869	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.400	0.839	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required

WWAN + 5GHz WLAN MIMO

Position	Conditions	Distance (mm)	Max. WWAN	Max. WLAN Main	Max. WLAN Aux	SAR Sum	SPLSR
Bottom side	WCDMA Band II	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	WCDMA Band IV	0	0.058	0.400	0.400	0.858	ΣSAR<1.6, Not required
	WCDMA Band V	0	0.016	0.400	0.400	0.816	ΣSAR<1.6, Not required
	LTE Band 2	0	0.042	0.400	0.400	0.842	ΣSAR<1.6, Not required
	LTE Band 4	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required
	LTE Band 5	0	0.018	0.400	0.400	0.818	ΣSAR<1.6, Not required
	LTE Band 7	0	0.064	0.400	0.400	0.864	ΣSAR<1.6, Not required
	LTE Band 12	0	0.048	0.400	0.400	0.848	ΣSAR<1.6, Not required
	LTE Band 13	0	0.038	0.400	0.400	0.838	ΣSAR<1.6, Not required
	LTE Band 17	0	0.043	0.400	0.400	0.843	ΣSAR<1.6, Not required
	LTE Band 26	0	0.017	0.400	0.400	0.817	ΣSAR<1.6, Not required
	LTE Band 30	0	0.069	0.400	0.400	0.869	ΣSAR<1.6, Not required
	LTE Band 38	0	0.039	0.400	0.400	0.839	ΣSAR<1.6, Not required
	LTE Band 41	0	0.045	0.400	0.400	0.845	ΣSAR<1.6, Not required
	LTE Band 66	0	0.056	0.400	0.400	0.856	ΣSAR<1.6, Not required

4. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	3770	Apr.25,2018	Apr.24,2019
SPEAG	System Validation Dipole	D750V3	1015	Aug.23,2018	Aug.22,2019
		D835V2	4d063	Aug.23,2018	Aug.22,2019
		D1750V2	1008	Aug.30,2018	Aug.29,2019
		D1900V2	5d173	Apr.25,2018	Apr.24,2019
		D2300V2	1023	Aug.24,2018	Aug.23,2019
		D2600V2	1005	Jan.17,2018	Jan.16,2019
SPEAG	Data acquisition Electronics	DAE4	856	Aug.21,2018	Aug.20,2019
SPEAG	Software	DASY 52 V52.8.8	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	Dec.21,2017	Dec.20,2018

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
Agilent	Power Sensor	E9301H	MY52200003	Dec.21,2017	Dec.20,2018
			MY52200004	Dec.21,2017	Dec.20,2018
TECPEL	Digital thermometer	DTM-303A	TP130075	Mar.09,2018	Mar.08,2019
Anritsu	Radio Communication Test	MT8820C	6201061014	Mar.14,2018	Mar.13,2019

5. Measurements

Date: 2018/9/19

WCDMA Band II_Body_Bottom side_CH 9538_0mm

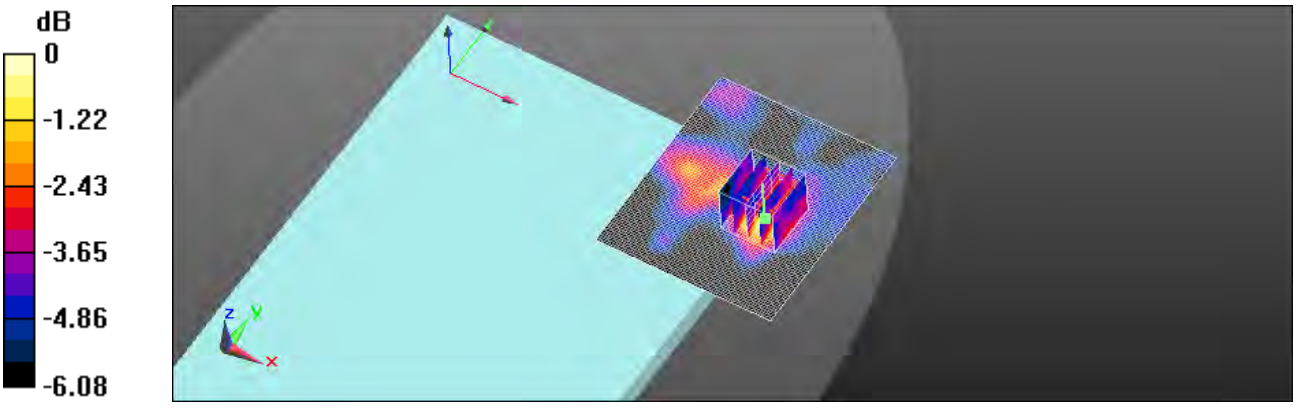
Communication System: WCDMA; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.585 S/m; ε_r = 50.733; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8, 8, 8); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0422 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.881 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.0560 W/kg
SAR(1 g) = 0.040 W/kg; SAR(10 g) = 0.030 W/kg
Maximum value of SAR (measured) = 0.0492 W/kg



0 dB = 0.0492 W/kg = -13.08 dBW/kg

Date: 2018/9/19

WCDMA Band IV_Body_Bottom side_CH 1412_0mm

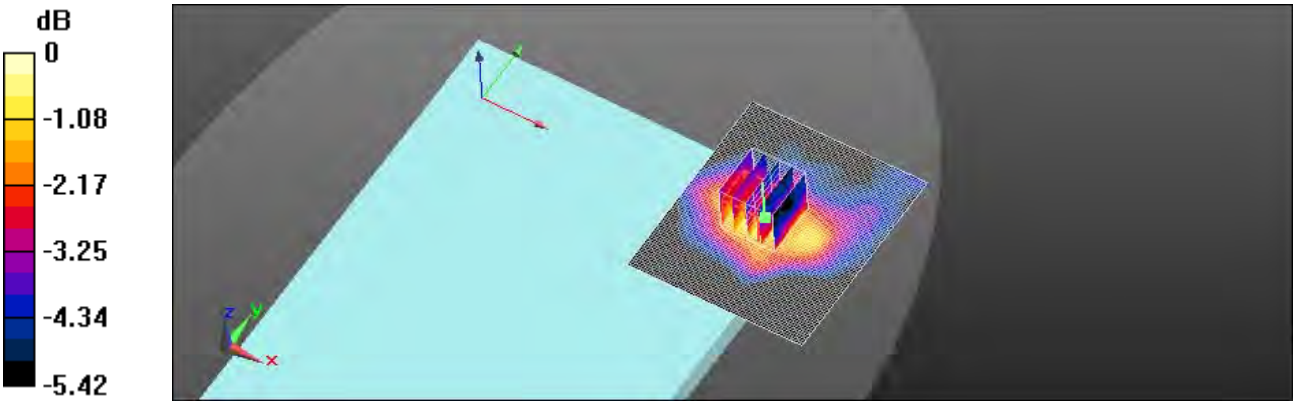
Communication System: WCDMA; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1732.4 MHz; σ = 1.414 S/m; ε_r = 51.323; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.4°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8.26, 8.26, 8.26); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0586 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.558 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.0650 W/kg
SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.038 W/kg
Maximum value of SAR (measured) = 0.0579 W/kg



0 dB = 0.0579 W/kg = -12.37 dBW/kg

Date: 2018/9/18

WCDMA Band V_Body_Bottom side_CH 4233_0mm

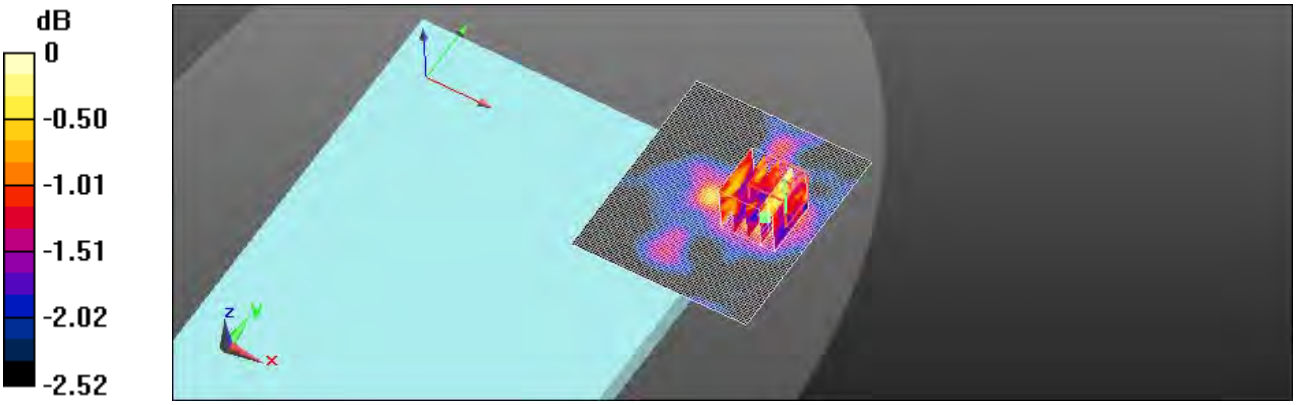
Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium parameters used: f = 847 MHz; σ = 1.005 S/m; ε_r = 57.248; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.72, 9.72, 9.72); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0155 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.575 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.0170 W/kg
SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.014 W/kg
Maximum value of SAR (measured) = 0.0169 W/kg



0 dB = 0.0169 W/kg = -17.72 dBW/kg

Date: 2018/9/19

LTE Band 2 (20MHz)_Body_Bottom side_CH 18900_QPSK_1-50_0mm

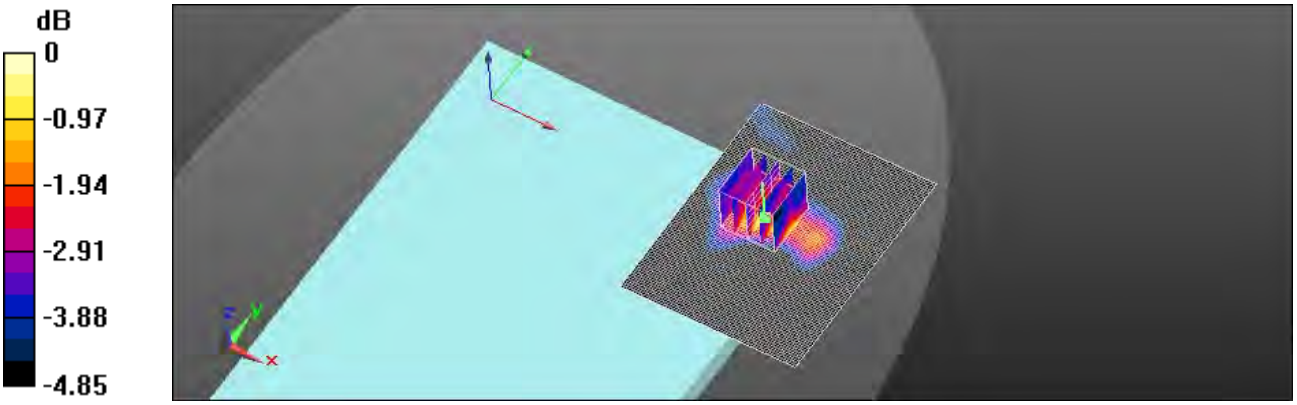
Communication System: LTE; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.559 S/m; ε_r = 50.823; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8, 8, 8); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x91x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0387 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.465 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0580 W/kg
SAR(1 g) = 0.042 W/kg; SAR(10 g) = 0.032 W/kg
Maximum value of SAR (measured) = 0.0480 W/kg



0 dB = 0.0480 W/kg = -13.19 dBW/kg

Date: 2018/9/19

LTE Band 4 (20MHz)_Body_Bottom side_CH 20050_QPSK_1-50_0mm

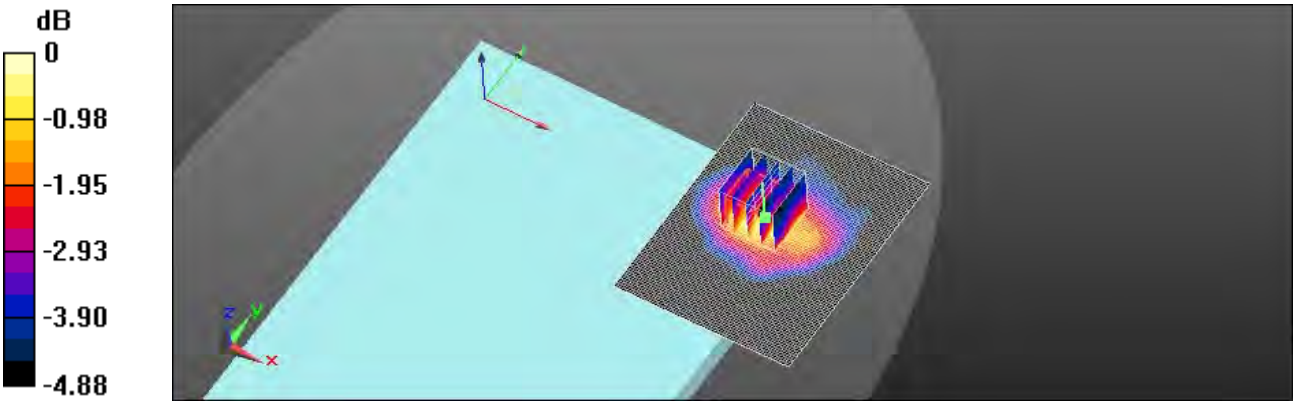
Communication System: LTE; Frequency: 1720 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.404 S/m; ε_r = 51.373; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.4°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8.26, 8.26, 8.26); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x91x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0561 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.107 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.0620 W/kg
SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.038 W/kg
Maximum value of SAR (measured) = 0.0554 W/kg



0 dB = 0.0554 W/kg = -12.56 dBW/kg

Date: 2018/9/18

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

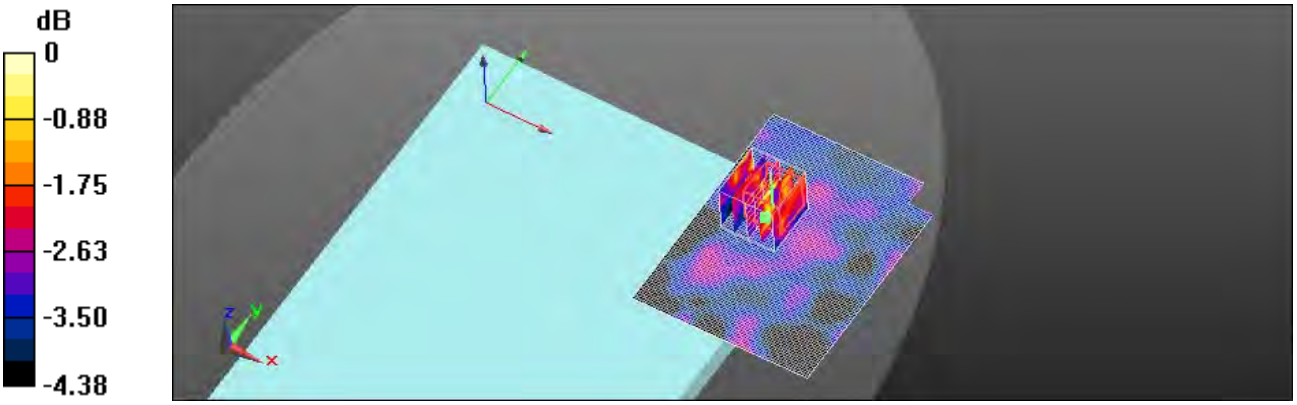
Communication System: LTE; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium parameters used: f = 836.5 MHz; σ = 0.995 S/m; ε_r = 57.401; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.72, 9.72, 9.72); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x91x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0142 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.020 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.0240 W/kg
SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.015 W/kg
Maximum value of SAR (measured) = 0.0241 W/kg



0 dB = 0.0241 W/kg = -16.18 dBW/kg

Date: 2018/9/21

LTE Band 7 (20MHz)_Body_Bottom side_CH 20850_QPSK_1-99_0mm

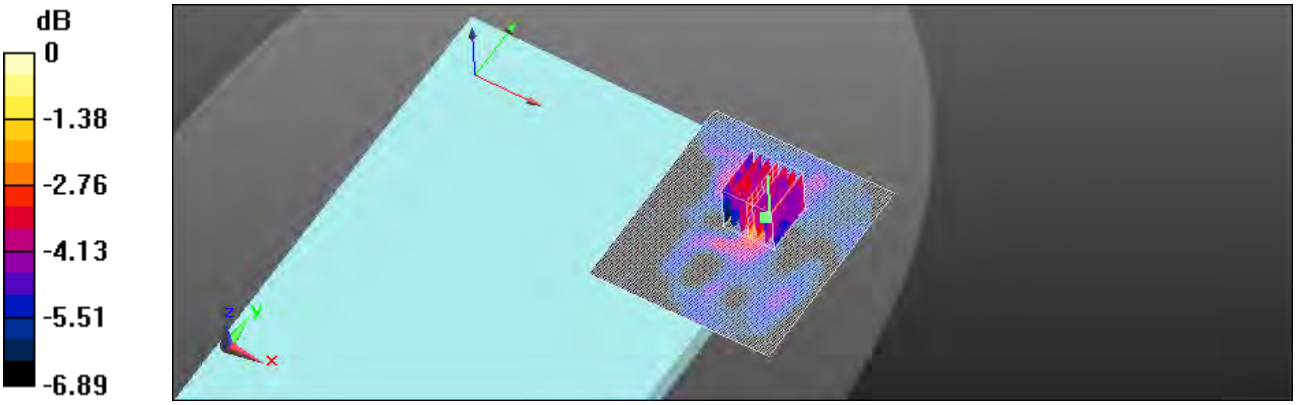
Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 2.098 S/m; ε_r = 52.875; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (91x101x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0551 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.521 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0860 W/kg
SAR(1 g) = 0.051 W/kg; SAR(10 g) = 0.036 W/kg
Maximum value of SAR (measured) = 0.0686 W/kg



0 dB = 0.0686 W/kg = -11.64 dBW/kg

Date: 2018/9/17

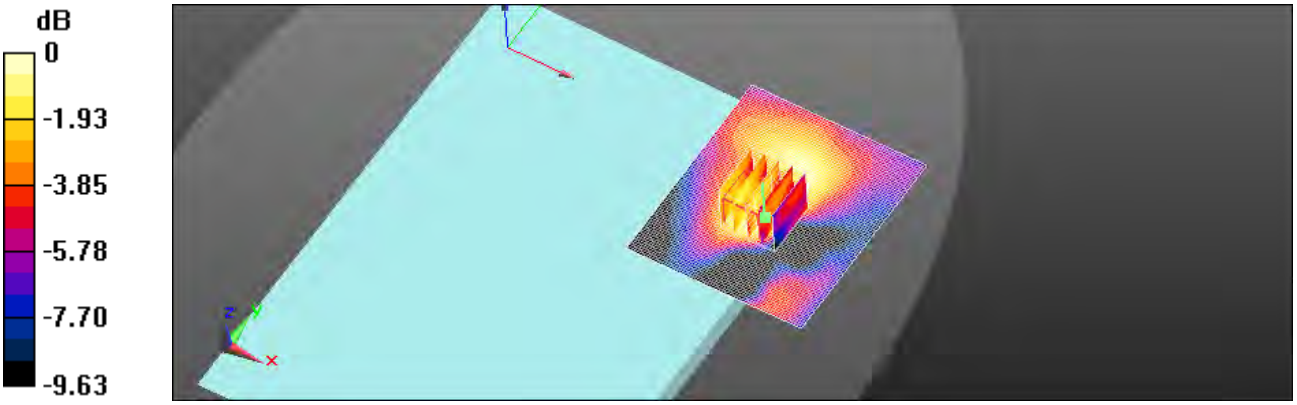
LTE Band 12 (10MHz)_Body_Bottom side_CH 23060_QPSK_1-49_0mm
Communication System: LTE; Frequency: 704 MHz; Duty Cycle: 1:1
Medium parameters used: f = 704 MHz; σ = 0.923 S/m; ε_r = 57.749; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.97, 9.97, 9.97); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0451 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.442 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.0560 W/kg
SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.029 W/kg
Maximum value of SAR (measured) = 0.0458 W/kg



0 dB = 0.0458 W/kg = -13.39 dBW/kg

Date: 2018/9/17

LTE Band 13 (10MHz)_Body_Bottom side_CH 23230_QPSK_1-25_0mm

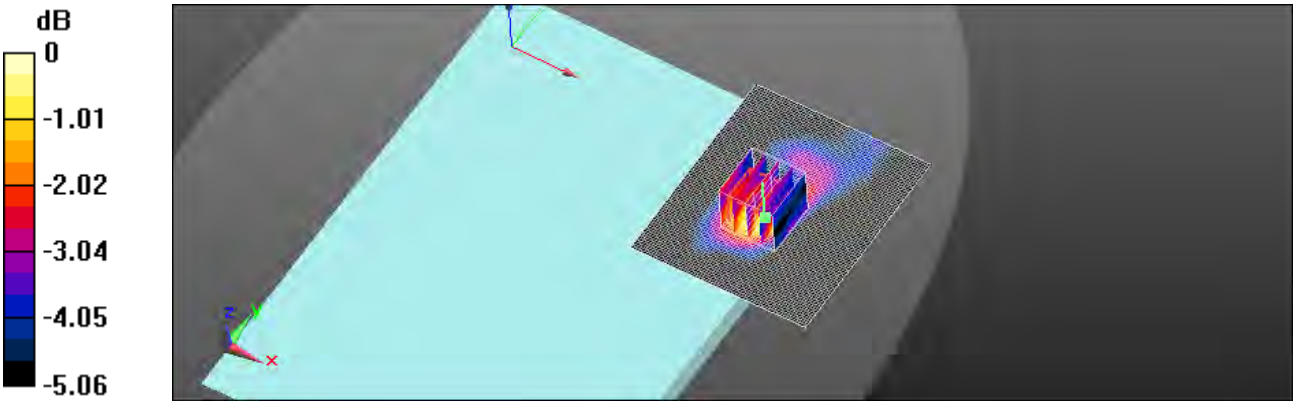
Communication System: LTE; Frequency: 782 MHz; Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; σ = 1.006 S/m; ε_r = 57.087; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.97, 9.97, 9.97); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0320 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.612 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.0350 W/kg
SAR(1 g) = 0.031 W/kg; SAR(10 g) = 0.024 W/kg
Maximum value of SAR (measured) = 0.0344 W/kg



0 dB = 0.0344 W/kg = -14.63 dBW/kg

Date: 2018/9/17

LTE Band 17 (10MHz)_Body_Bottom side_CH 23790_QPSK_1-49_0mm

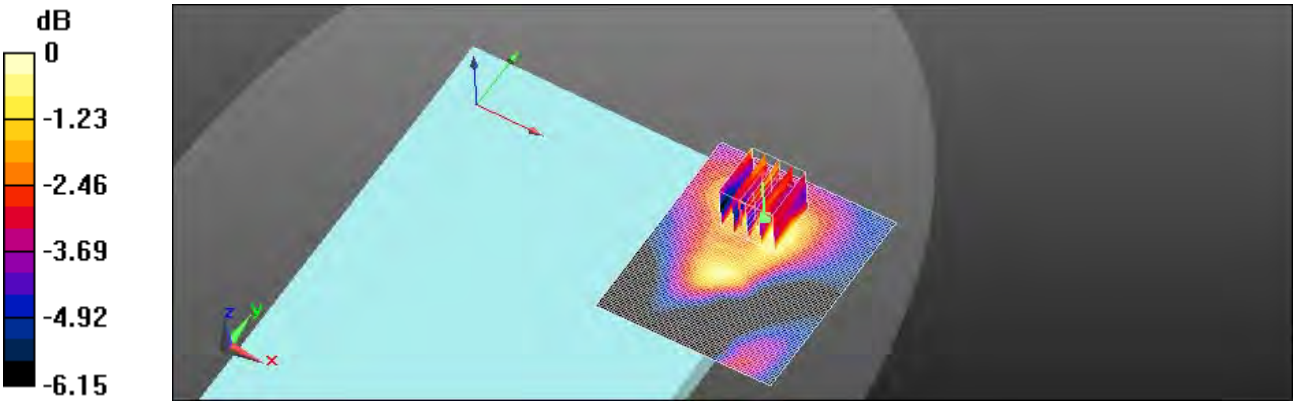
Communication System: LTE; Frequency: 710 MHz; Duty Cycle: 1:1
Medium parameters used: f = 710 MHz; σ = 0.934 S/m; ε_r = 57.704; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.97, 9.97, 9.97); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0452 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.407 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0530 W/kg
SAR(1 g) = 0.039 W/kg; SAR(10 g) = 0.028 W/kg
Maximum value of SAR (measured) = 0.0462 W/kg



0 dB = 0.0462 W/kg = -13.35 dBW/kg

Date: 2018/9/18

LTE Band 26 (15MHz)_Body_Bottom side_CH 26765_QPSK_1-74_0mm

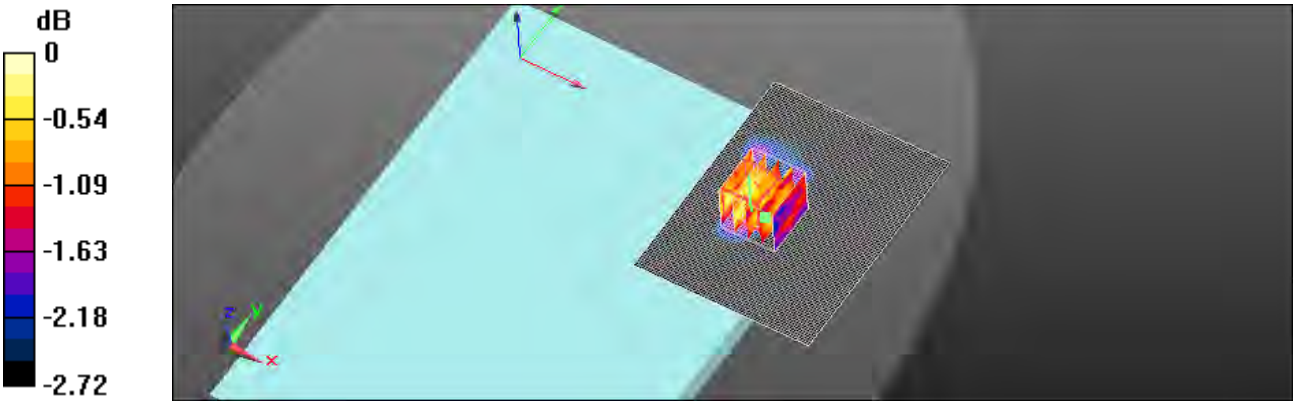
Communication System: LTE; Frequency: 821.5 MHz; Duty Cycle: 1:1
Medium parameters used: f = 821.5 MHz; σ = 0.984 S/m; ε_r = 57.495; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.72, 9.72, 9.72); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x91x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0125 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.126 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.0160 W/kg
SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.014 W/kg
Maximum value of SAR (measured) = 0.0163 W/kg



0 dB = 0.0163 W/kg = -17.88 dBW/kg

Date: 2018/9/20

LTE Band 30 (10MHz)_Body_Bottom side_CH 27710_QPSK_1-25_0mm

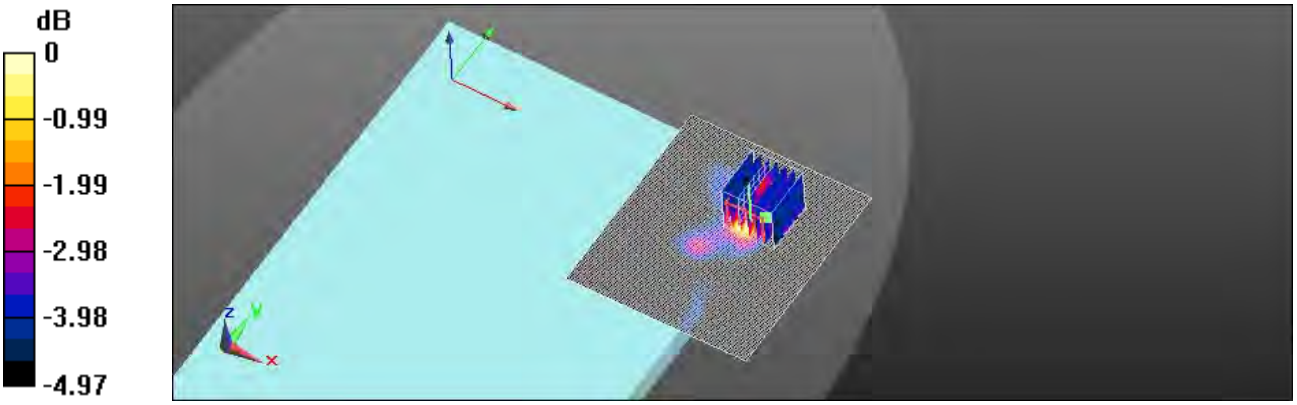
Communication System: LTE; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2310 MHz; σ = 1.877 S/m; ε_r = 53.545; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.6°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.68, 7.68, 7.68); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (91x101x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0638 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.466 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.0800 W/kg
SAR(1 g) = 0.051 W/kg; SAR(10 g) = 0.036 W/kg
Maximum value of SAR (measured) = 0.0629 W/kg



0 dB = 0.0629 W/kg = -12.01 dBW/kg

Date: 2018/9/21

LTE Band 38 (20MHz)_Body_Bottom side_CH 37850_QPSK_1-99_0mm

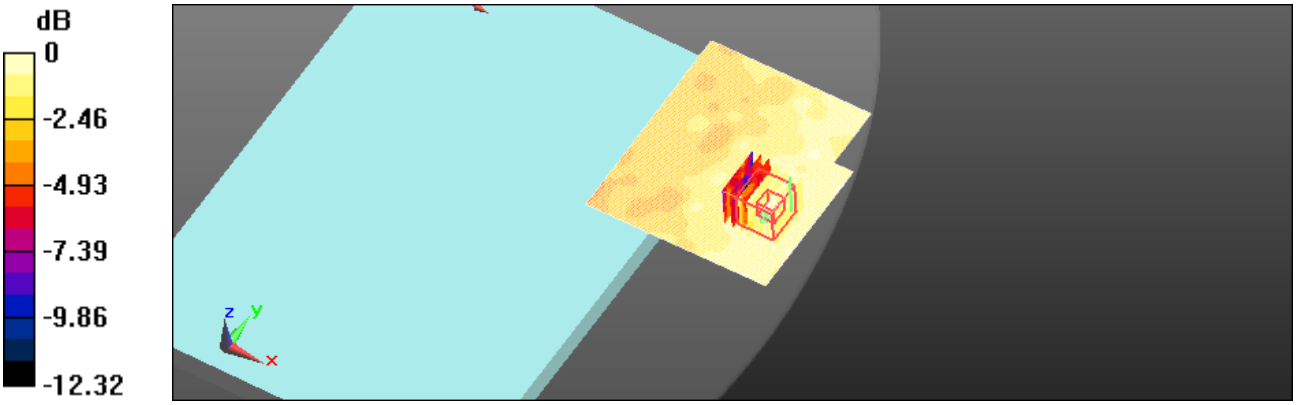
Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; σ = 2.098 S/m; ε_r = 52.875; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (91x101x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0337 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.658 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.0380 W/kg
SAR(1 g) = 0.032 W/kg; SAR(10 g) = 0.027 W/kg
Maximum value of SAR (measured) = 0.0381 W/kg



0 dB = 0.0381 W/kg = -14.19 dBW/kg

Date: 2018/9/21

LTE Band 41 (20MHz)_Body_Bottom side_CH 40620_QPSK_1-99_0mm

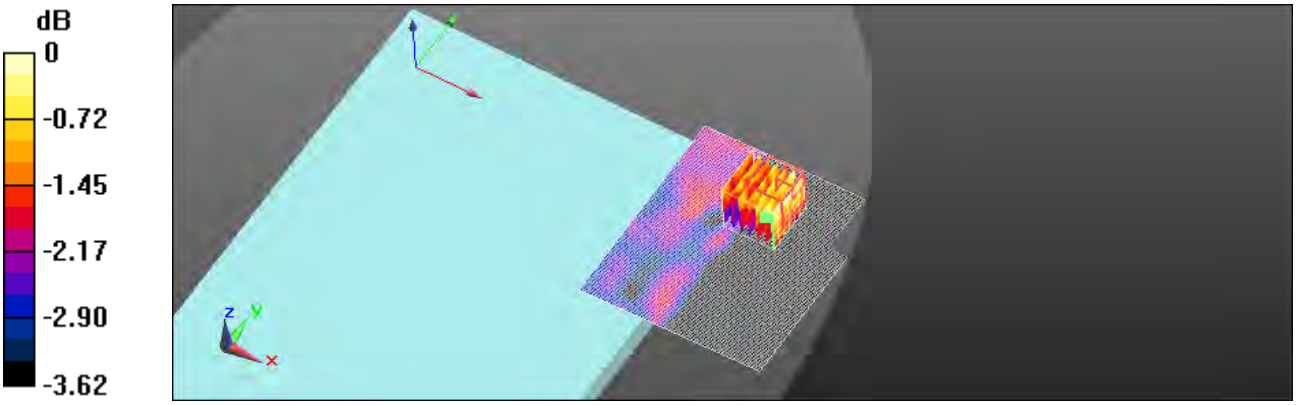
Communication System: LTE; Frequency: 2593 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2593 MHz; σ = 2.212 S/m; ε_r = 52.671; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (91x101x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0378 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.157 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.0500 W/kg
SAR(1 g) = 0.043 W/kg; SAR(10 g) = 0.037 W/kg
Maximum value of SAR (measured) = 0.0495 W/kg



0 dB = 0.0495 W/kg = -13.05 dBW/kg

Date: 2018/9/19

LTE Band 66 (20MHz)_Body_Bottom side_CH 132322_QPSK_1-99_0mm

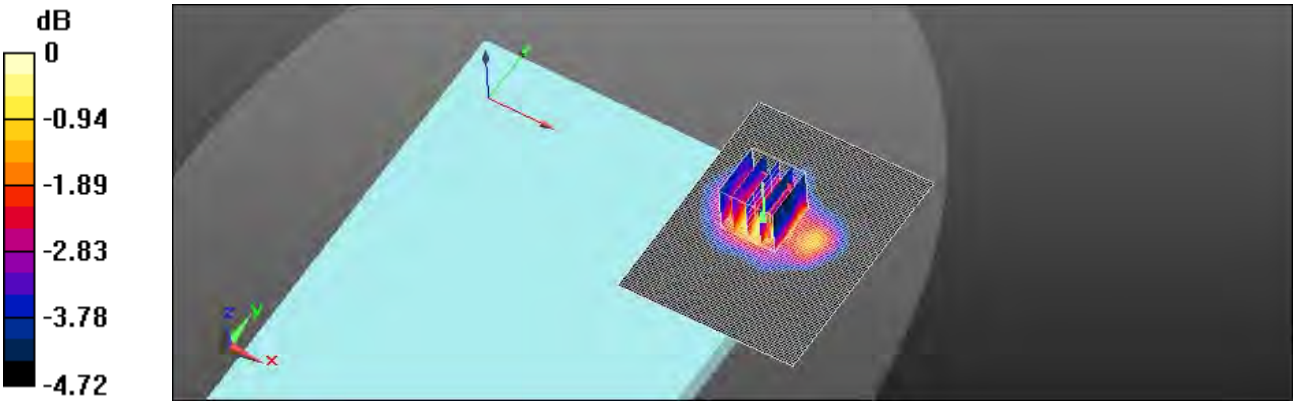
Communication System: LTE; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1745 MHz; σ = 1.431 S/m; ε_r = 51.331; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.4°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8.26, 8.26, 8.26); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI;
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x91x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0547 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.745 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0610 W/kg
SAR(1 g) = 0.047 W/kg; SAR(10 g) = 0.037 W/kg
Maximum value of SAR (measured) = 0.0537 W/kg



0 dB = 0.0537 W/kg = -12.70 dBW/kg

6. SAR System Performance Verification

Date: 2018/9/17

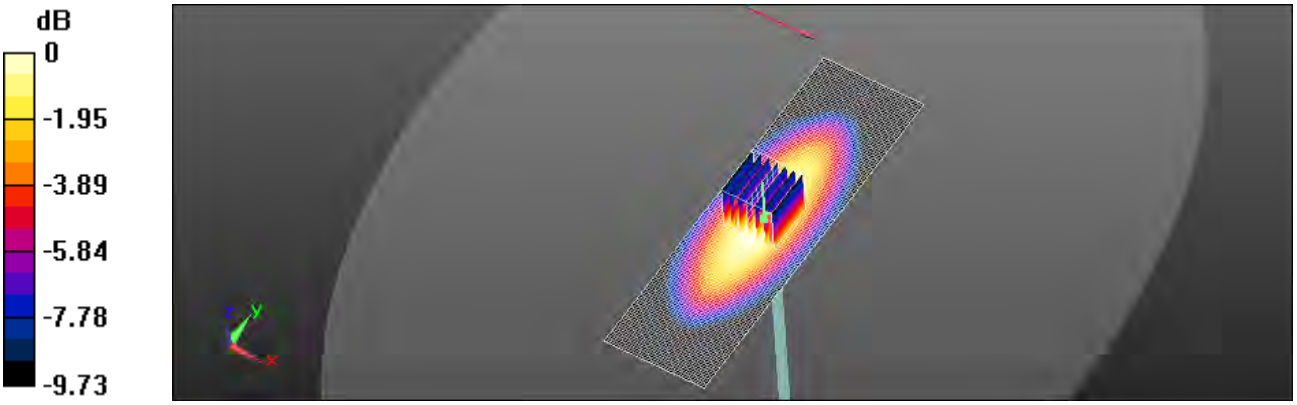
Dipole 750 MHz_SN:1015

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.975 S/m; ε_r = 57.292; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.5°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.97, 9.97, 9.97); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Pin=250mW/Area Scan (41x141x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 2.71 W/kg
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.21 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 2.72 W/kg



0 dB = 2.72 W/kg = 4.35 dBW/kg

Date: 2018/9/18

Dipole 835 MHz_SN:4d063

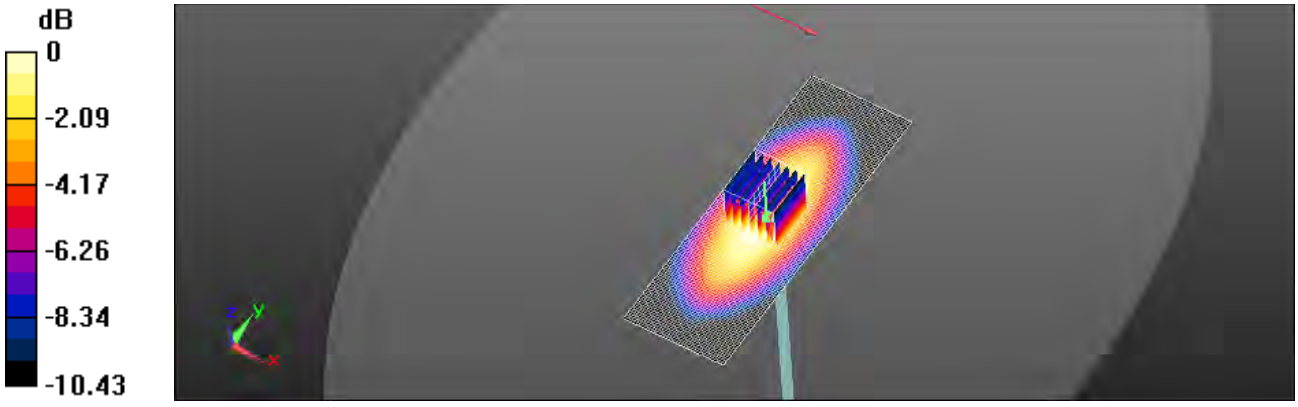
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.994 S/m; ε_r = 57.385; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(9.72, 9.72, 9.72); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Pin=250mW/Area Scan (41x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 3.08 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.62 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.08 W/kg



0 dB = 3.08 W/kg = 4.89 dBW/kg

Date: 2018/9/19

Dipole 1750 MHz_SN:1008

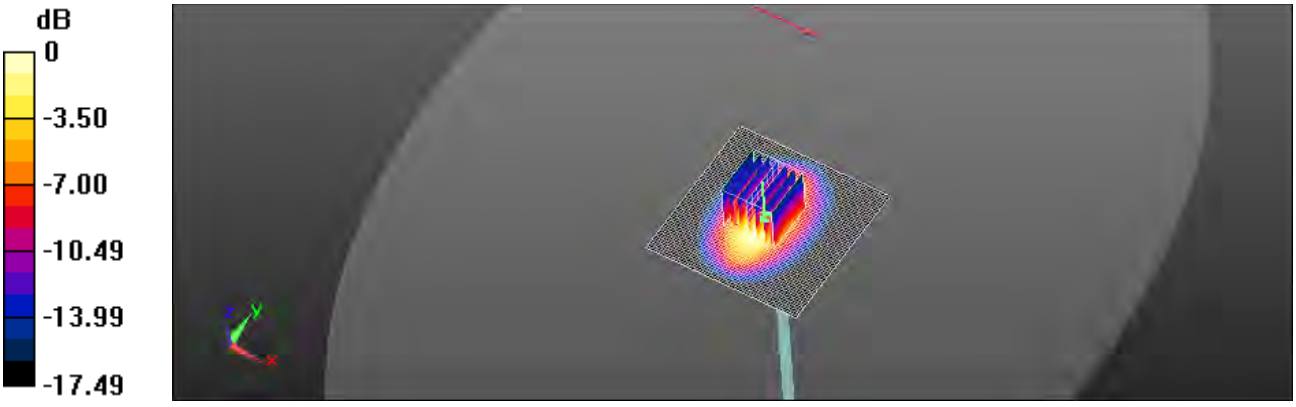
Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.432 S/m; ε_r = 51.275; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.4°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8.26, 8.26, 8.26); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 12.8 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.97 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 8.89 W/kg; SAR(10 g) = 4.62 W/kg
Maximum value of SAR (measured) = 12.9 W/kg



0 dB = 12.9 W/kg = 11.11 dBW/kg

Date: 2018/9/19

Dipole 1900 MHz_SN:5d173

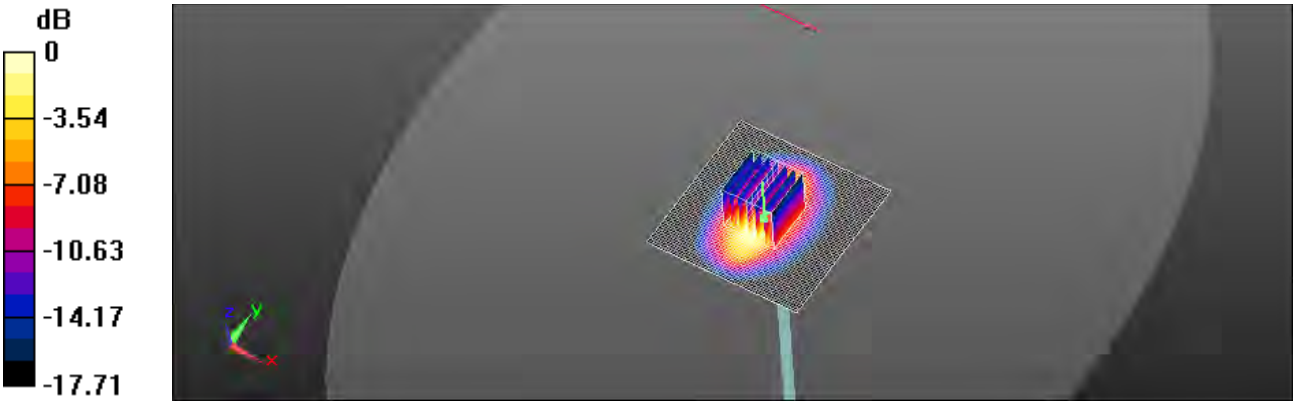
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.574 S/m; ε_r = 50.772; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(8, 8, 8); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 14.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.58 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 14.5 W/kg



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

Date: 2018/9/20

Dipole 2300 MHz_SN:1023

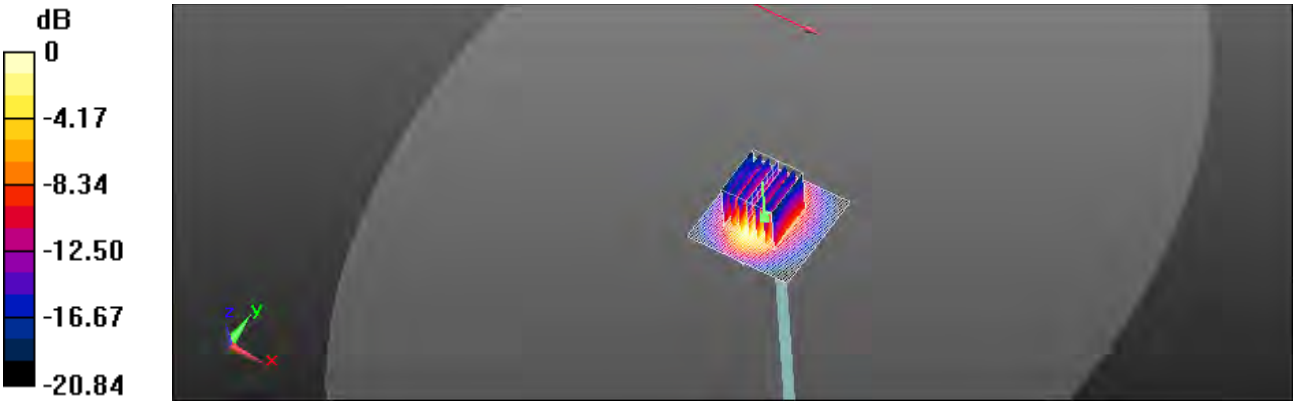
Communication System: CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2300 MHz; σ = 1.865 S/m; ε_r = 53.572; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 21.6°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.68, 7.68, 7.68); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Pin=250mW/Area Scan (51x51x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 18.4 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.23 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 23.1 W/kg
SAR(1 g) = 11.6 W/kg; SAR(10 g) = 5.45 W/kg
Maximum value of SAR (measured) = 17.5 W/kg



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

Date: 2018/9/21

Dipole 2600 MHz_SN:1005

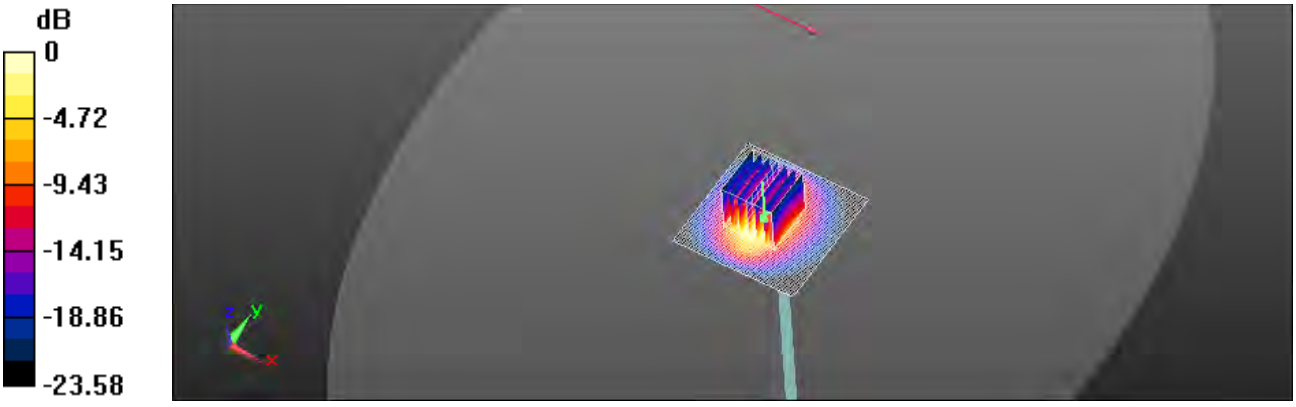
Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.227 S/m; ε_r = 52.54; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.2°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3770; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/4/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn856; Calibrated: 2018/4/21
- Phantom: ELI
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 22.9 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.37 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 31.7 W/kg
SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.5 W/kg
Maximum value of SAR (measured) = 23.0 W/kg



0 dB = 23.0 W/kg = 13.62 dBW/kg

7. DAE & Probe Calibration Certificate

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

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

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

Accreditation No.: SCS 0108

Client SGS-TW (Auden)

Certificate No: DAE4-856_Apr18

CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BM - SN: 856

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

Calibration date: April 21, 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:	Adrian Gehring	Laboratory Technician	
Approved by:	Sven Kühn	Deputy Manager	

Issued: April 21, 2018

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

Certificate No: DAE4-856_Apr18 Page 1 of 5

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

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

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

Accreditation No.: **SCS 0108**

Glossary

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	403.380 ± 0.02% (k=2)	404.500 ± 0.02% (k=2)	403.824 ± 0.02% (k=2)
Low Range	3.97569 ± 1.50% (k=2)	3.98803 ± 1.50% (k=2)	3.94148 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	264.5 ° ± 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	199991.32	-3.93	-0.00
Channel X	+ Input	20000.89	-0.73	-0.00
Channel X	- Input	-19999.72	1.36	-0.01
Channel Y	+ Input	199995.30	0.19	0.00
Channel Y	+ Input	19999.58	-1.96	-0.01
Channel Y	- Input	-20002.18	-0.91	0.00
Channel Z	+ Input	199995.15	0.22	0.00
Channel Z	+ Input	19998.23	-3.34	-0.02
Channel Z	- Input	-20002.45	-1.22	0.01

Low Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	2001.18	-0.15	-0.01
Channel X	+ Input	202.02	0.40	0.20
Channel X	- Input	-197.78	0.37	-0.19
Channel Y	+ Input	1999.81	-1.28	-0.06
Channel Y	+ Input	201.37	-0.27	-0.13
Channel Y	- Input	-199.29	-0.94	0.47
Channel Z	+ Input	2000.80	-0.29	-0.01
Channel Z	+ Input	201.21	-0.19	-0.10
Channel Z	- Input	-199.51	-1.18	0.60

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	-13.71	-15.90
	- 200	17.59	16.11
Channel Y	200	-2.20	-2.52
	- 200	0.55	-0.02
Channel Z	200	11.04	10.58
	- 200	-12.61	-12.99

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	-	2.30	-2.46
Channel Y	200	7.31	-	3.25
Channel Z	200	8.90	4.49	-

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	16218	15730
Channel Y	15957	16114
Channel Z	15879	16093

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	-0.35	-1.46	1.21	0.40
Channel Y	-0.34	-1.68	0.58	0.46
Channel Z	-0.03	-1.43	1.45	0.57

6. Input Offset Current

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

7. Input Resistance (Typical values for information)

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

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

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

9. Power Consumption (Typical values for information)

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

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Accreditation No.: SCS 0108

Client: SGS-TW (Auden) Certificate No: EX3-3770_Apr18

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3770

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: 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. 217-02572/02573)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02572)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02573)	Apr-19
Reference 20 dB Attenuator	SN: 55277 (20x)	04-Apr-18 (No. 217-02582)	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-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-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 26, 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).

Probe EX3DV4

SN:3770

Manufactured: July 6, 2010
Calibrated: April 25, 2018

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

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.30	0.60	0.38	± 10.1 %
DCP (mV)[B]	101.9	101.9	101.5	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	138.1	±3.5 %
		Y	0.0	0.0	1.0		134.7	
		Z	0.0	0.0	1.0		135.6	

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.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
450	43.5	0.87	11.20	11.20	11.20	0.13	1.25	± 13.3 %
750	41.9	0.89	10.05	10.05	10.05	0.43	0.80	± 12.0 %
835	41.5	0.90	9.55	9.55	9.55	0.35	0.97	± 12.0 %
900	41.5	0.97	9.36	9.36	9.36	0.27	1.10	± 12.0 %
1750	40.1	1.37	8.48	8.48	8.48	0.35	0.80	± 12.0 %
1900	40.0	1.40	8.22	8.22	8.22	0.32	0.80	± 12.0 %
2000	40.0	1.40	8.15	8.15	8.15	0.38	0.80	± 12.0 %
2300	39.5	1.67	7.78	7.78	7.78	0.33	0.84	± 12.0 %
2450	39.2	1.80	7.43	7.43	7.43	0.38	0.80	± 12.0 %
2600	39.0	1.96	7.20	7.20	7.20	0.36	0.84	± 12.0 %
5250	35.9	4.71	5.25	5.25	5.25	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.92	4.92	4.92	0.40	1.80	± 13.1 %
5750	35.4	5.22	5.21	5.21	5.21	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.

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

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
450	56.7	0.94	10.68	10.68	10.68	0.08	1.25	± 13.3 %
750	55.5	0.96	9.97	9.97	9.97	0.39	0.95	± 12.0 %
835	55.2	0.97	9.72	9.72	9.72	0.45	0.88	± 12.0 %
900	55.0	1.05	9.64	9.64	9.64	0.44	0.85	± 12.0 %
1750	53.4	1.49	8.26	8.26	8.26	0.43	0.80	± 12.0 %
1900	53.3	1.52	8.00	8.00	8.00	0.37	0.87	± 12.0 %
2000	53.3	1.52	7.97	7.97	7.97	0.29	1.00	± 12.0 %
2300	52.9	1.81	7.68	7.68	7.68	0.42	0.84	± 12.0 %
2450	52.7	1.95	7.59	7.59	7.59	0.41	0.84	± 12.0 %
2600	52.5	2.16	7.37	7.37	7.37	0.15	0.98	± 12.0 %
5250	48.9	5.36	4.65	4.65	4.65	0.50	1.90	± 13.1 %
5600	48.5	5.77	4.06	4.06	4.06	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.38	4.38	4.38	0.50	1.90	± 13.1 %

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

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

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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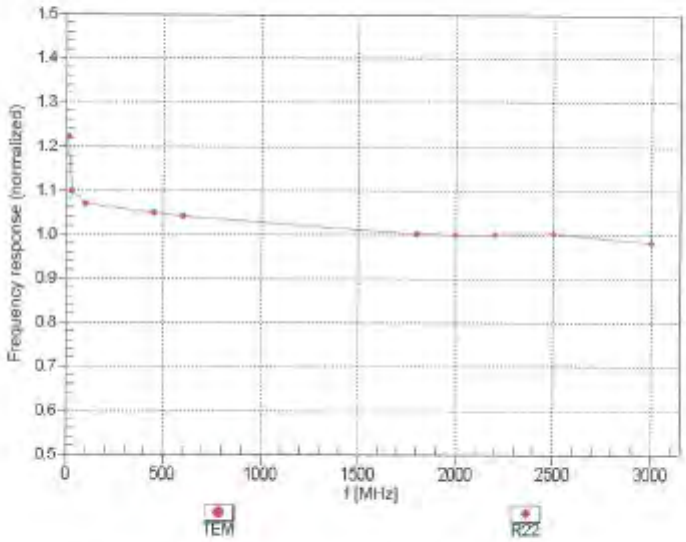
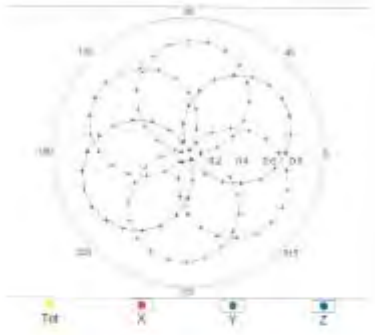
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



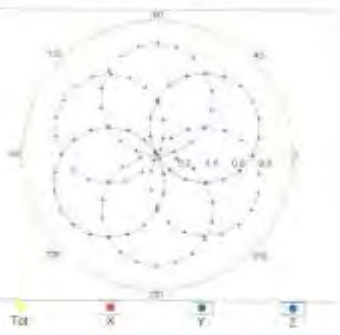
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

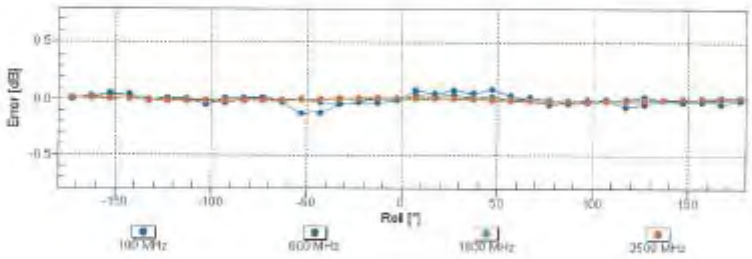
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22





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

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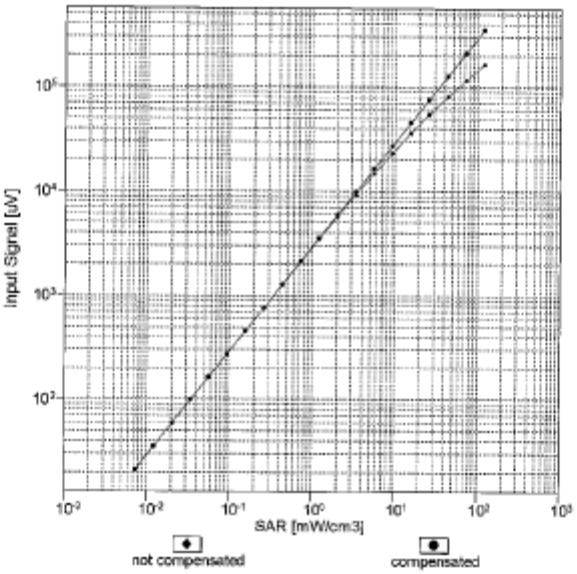
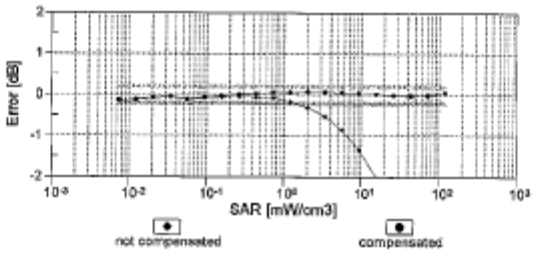
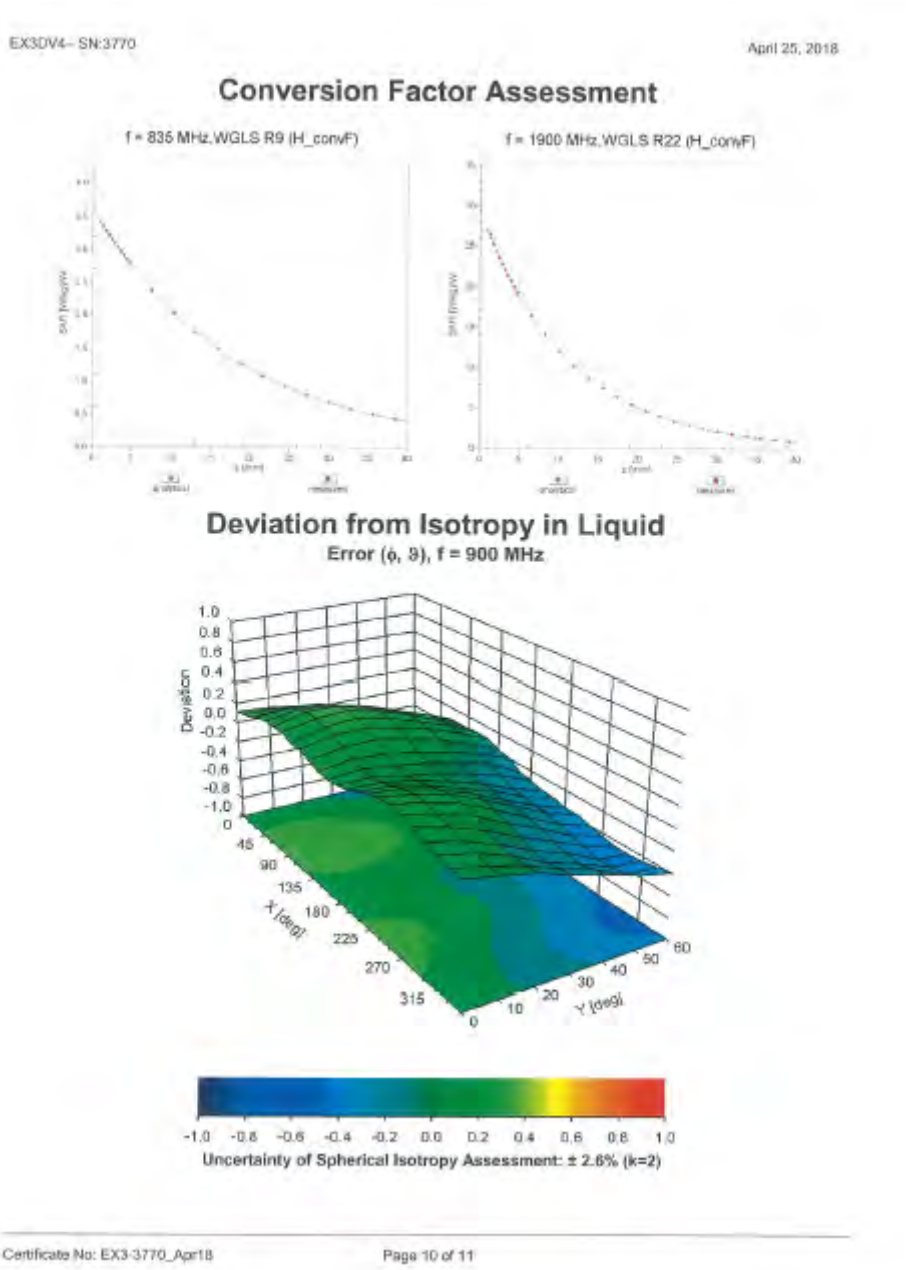
Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)





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



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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-32.8
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

8. Uncertainty Budget

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

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	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 shell	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.)	4.31%	N	1	1	0.64	0.43	2.76%	1.85%	M
Liquid Conductivity (mea.)	4.83%	N	1	1	0.6	0.49	2.90%	2.37%	M
Combined standard uncertainty		RSS					12.10%	11.80%	
Expant uncertainty (95% confidence interval), K=2							24.20%	23.59%	

9.Phantom Description

Schmid & Partner Engineering AG
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info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

Item	Oval Flat Phantom ELI 5.0
Type No	QD OVA 002 A
Series No	1108 and higher
Manufacturer	Untersee Composites Knebelstrasse 8, CH-8268 Mannenbach, Switzerland

Tests
Complete tests were made on the prototype units QD OVA 001 A, pre-series units QD OVA 001 B as well as on some series units QD OVA 001 B. Some tests are made on all series units QD OVA 002 A.

Test	Requirement	Details	Units tested
Shape	Internal dimensions, depth and sagging are compatible with standards	Bottom elliptical 600 x 400 mm, Depth 190 mm, dimension compliant with [1] for f > 375 MHz	Prototypes
Material thickness	Bottom: 2.0mm +/- 0.2mm	dimension compliant with [3] for f > 800 MHz	all
Material parameters	rel. permittivity 2 – 5, loss tangent ≤ 0.05, at f ≤ 6 GHz	rel. permittivity 3.5 +/- 0.5 loss tangent ≤ 0.05	Material samples
Material resistivity	Compatibility with tissue simulating liquids .	Compatible with SPEAG liquids. **	Phantoms, Material sample
Sagging	Sagging of the flat section in tolerance when filled with tissue simulating liquid.	within tolerance for filling height up to 155 mm	Prototypes, samples

** Note: Compatibility restrictions apply certain liquid components mentioned in the standard, containing e.g. DGBE, DGMHE or Triton X-100. Observe technical note on material compatibility.

Standards
[1] OET Bulletin 65, Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 01-01
[2] IEEE 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques, December 2003
[3] IEC 62209–1 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", 2005-02-18
[4] IEC 62209–2 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 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)", 2010-03-30

Conformity
Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of **body-worn** SAR measurements and system performance checks as specified in [1 – 4] and further standards.

Date 25.7.2011

Signature / Stamp

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10. System Validation from Original Equipment Supplier

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

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C Service suisse d'étalonnage
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S Swiss Calibration Service

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

Accreditation No.: SCS 0108

Client SGS-TW (Auden)

Certificate No: D750V3-1015_Aug18

CALIBRATION CERTIFICATE

Object D750V3 - SN:1015

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

Calibration date: August 23, 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 Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 24, 2018

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

Certificate No: D750V3-1015_Aug18 Page 1 of 8

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

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S Swiss Calibration Service

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

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	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 %	0.89 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	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.23 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.34 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.34 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	55.0 ± 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	**8.62 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	**5.71 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	53.4 Ω + 0.0 jΩ
Return Loss	- 29.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.2 Ω - 3.6 jΩ
Return Loss	- 27.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.037 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	March 22, 2010

DASY5 Validation Report for Head TSL

Date: 22.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

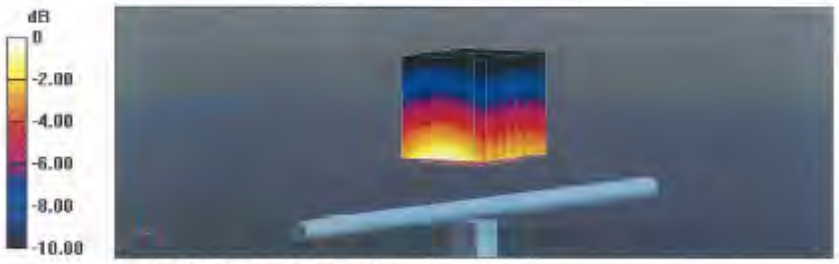
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1015

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.89 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:

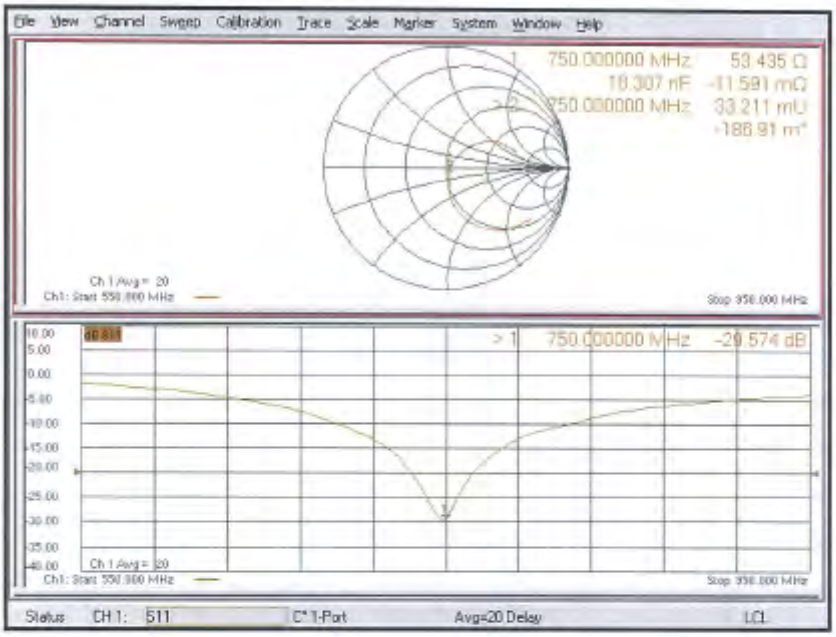
- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 59.12 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.34 W/kg
Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.42 dBW/kg

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 23.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

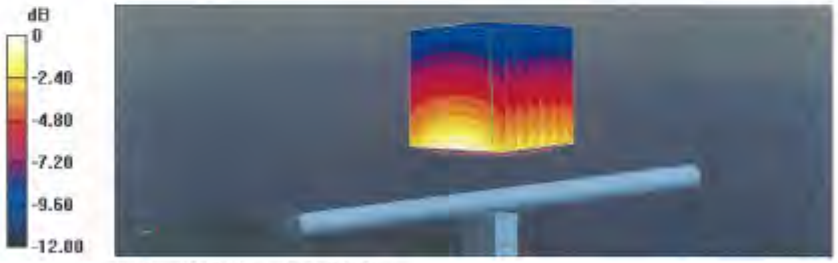
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1015

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

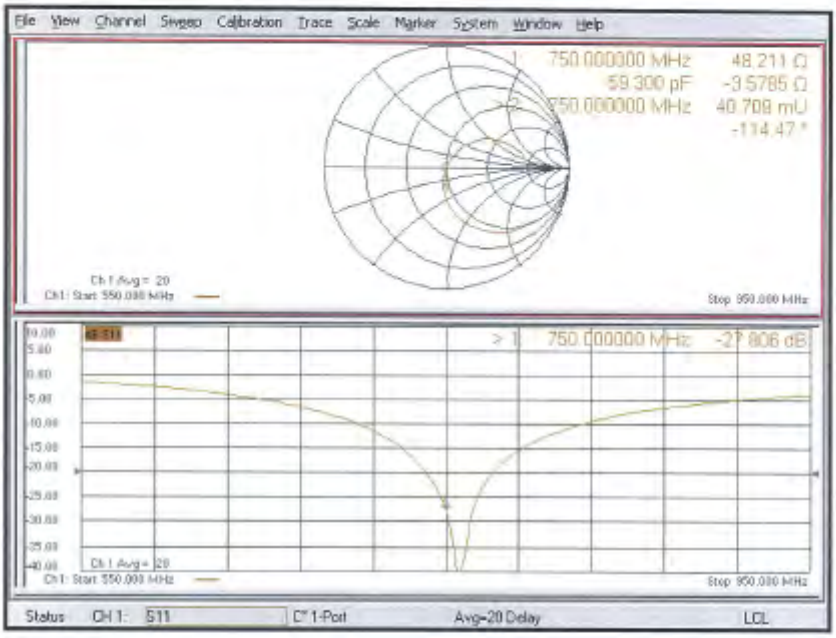
- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 57.93 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.17 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

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client SGS-TW (Auden)

Certificate No: D835V2-4d063_Aug18

CALIBRATION CERTIFICATE

Object: D835V2 - SN:4d063

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

Calibration date: August 23, 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 Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 24, 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%.

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 %	0.92 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	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.48 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.9 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	—	—

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.56 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.28 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3 Ω - 1.8 jΩ
Return Loss	- 33.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7 Ω - 4.4 jΩ
Return Loss	- 25.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.393 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 27, 2006

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DASY5 Validation Report for Head TSL

Date: 22.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

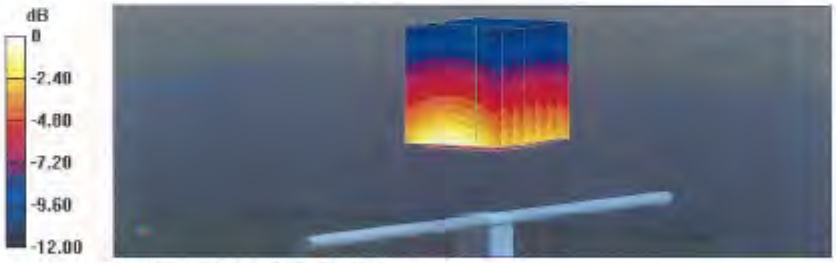
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 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:

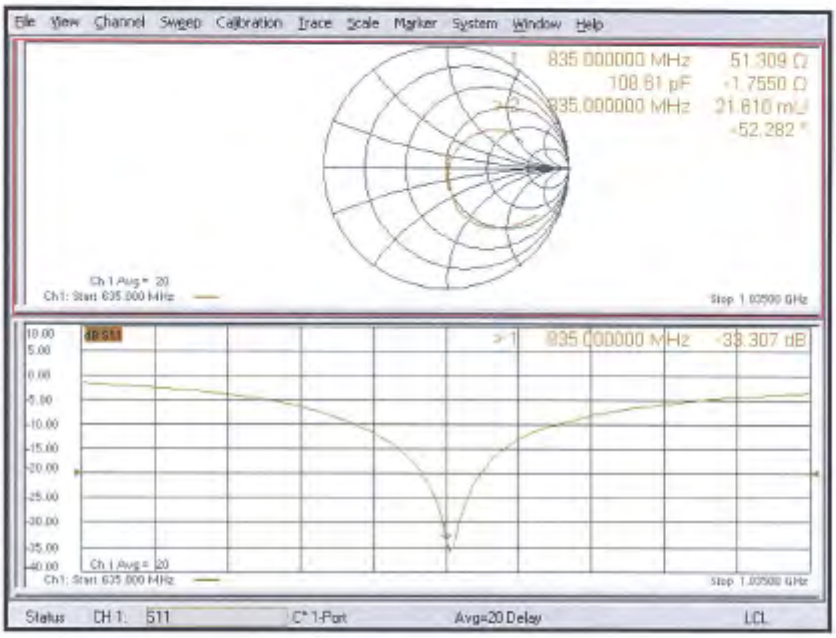
- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 62.96 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.70 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.25 W/kg



0 dB = 3.25 W/kg = 5.12 dBW/kg

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 23.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

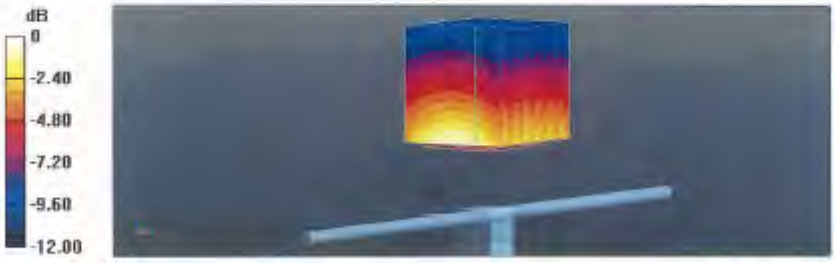
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

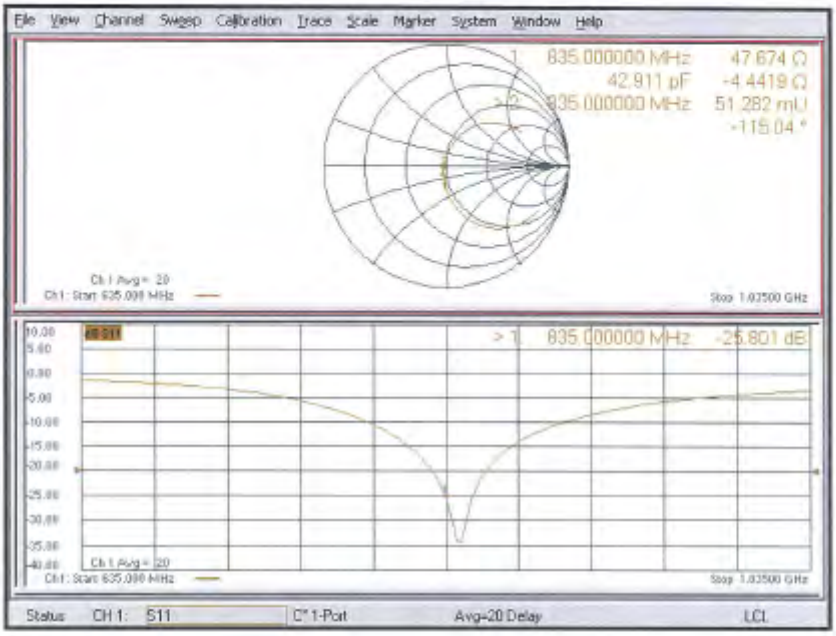
- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 60.67 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.61 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 3.23 W/kg



0 dB = 3.23 W/kg = 5.09 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client SGS-TW (Auden)

Certificate No: D1750V2-1008_Aug18

CALIBRATION CERTIFICATE

Object D1750V2 - SN:1008

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

Calibration date: August 30, 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 Agilent E8358A	SN: US41080477	31-Mar-14 (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: August 30, 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%.

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	38.9 ± 6 %	1.34 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	9.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.81 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	53.4 ± 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	9.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.0 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.93 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.8 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 1.6 jΩ
Return Loss	- 32.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3 Ω + 0.6 jΩ
Return Loss	- 34.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.207 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 11, 2009

DASY5 Validation Report for Head TSL

Date: 30.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

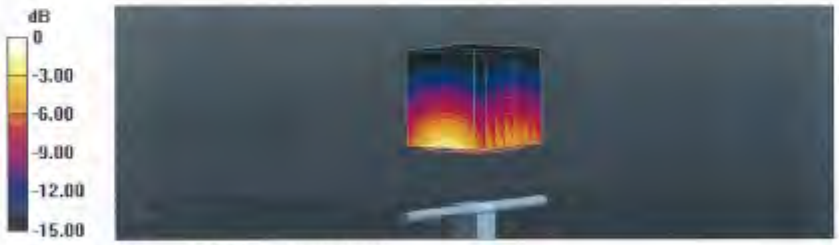
DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.34 S/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

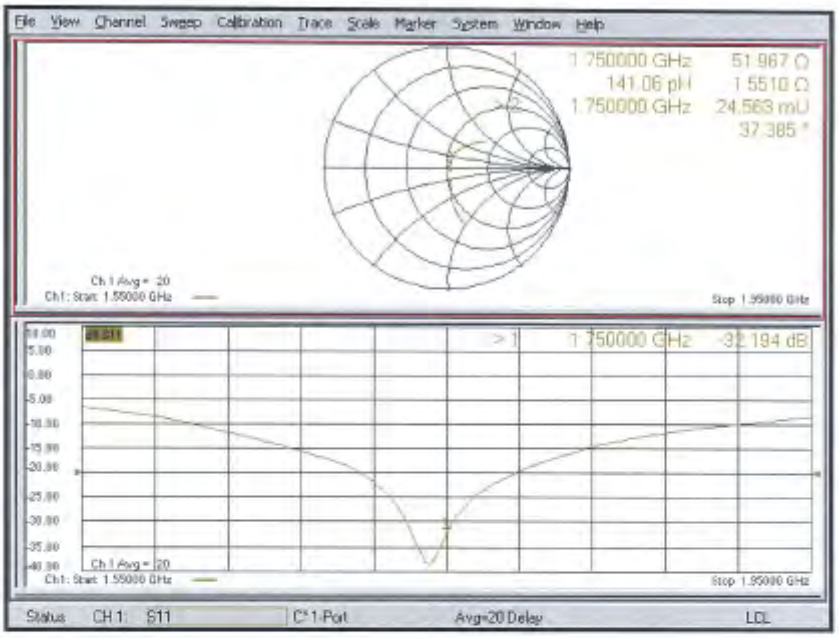
- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 107.6 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.07 W/kg; SAR(10 g) = 4.81 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



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

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 30.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

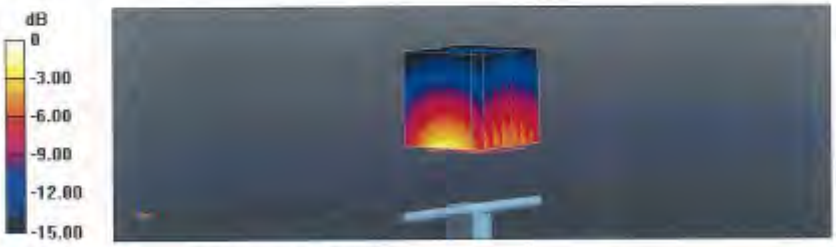
DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.47 S/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

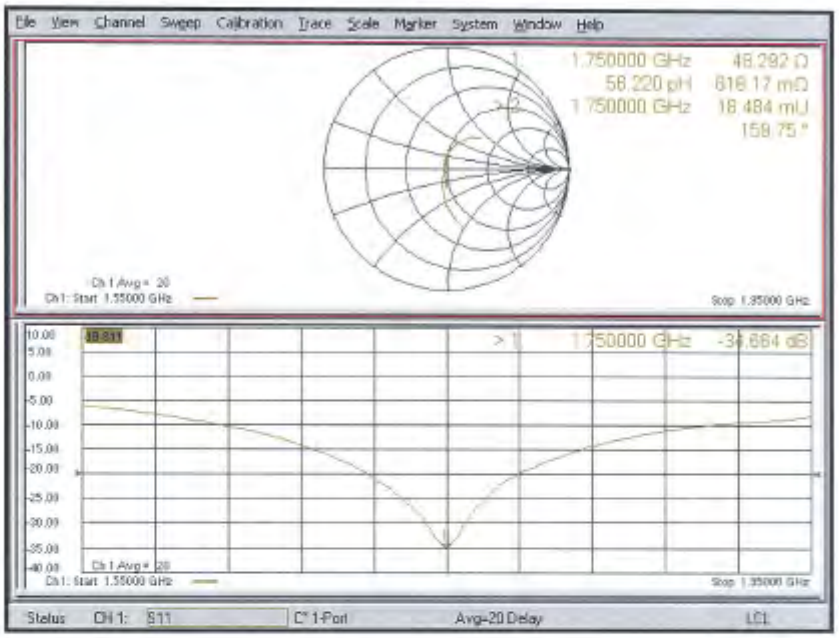
- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 101.7 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 15.9 W/kg
SAR(1 g) = 9.16 W/kg; SAR(10 g) = 4.93 W/kg
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

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	28-Oct-17 (No. DAE4-601_Oct17)	Oct-18

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

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

Issued: April 25, 2018

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Certificate No: D1900V2-5d173_Apr18 Page 1 of 8

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Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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 cm³ (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 cm³ (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 cm³ (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 cm³ (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)**

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	- 25.8 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

DASY5 Validation Report for Head TSL

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

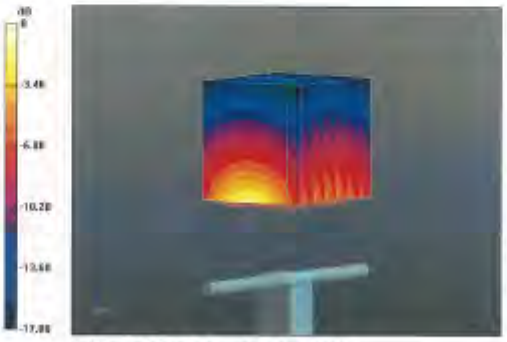
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

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:

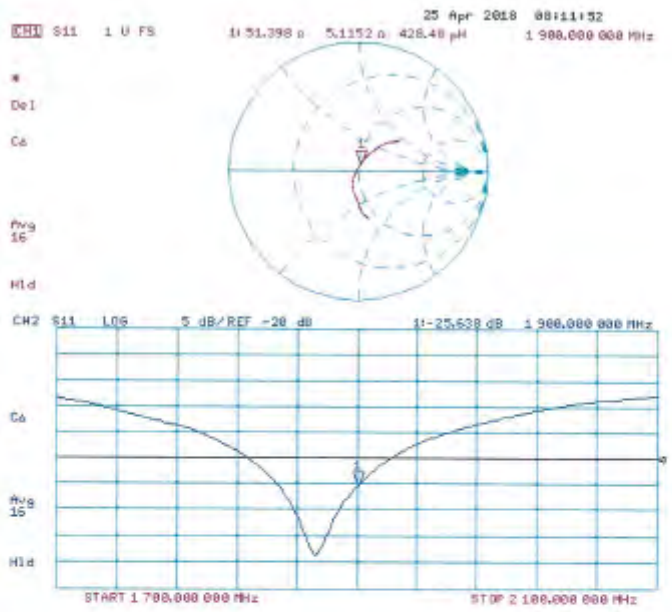
- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

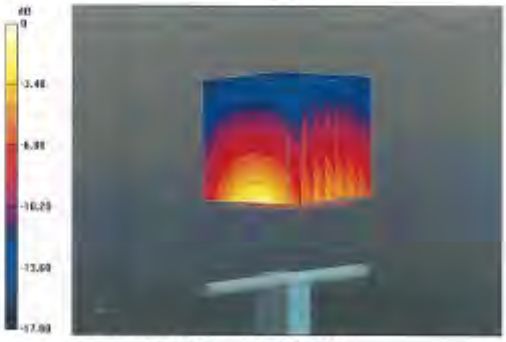
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

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

DASY52 Configuration:

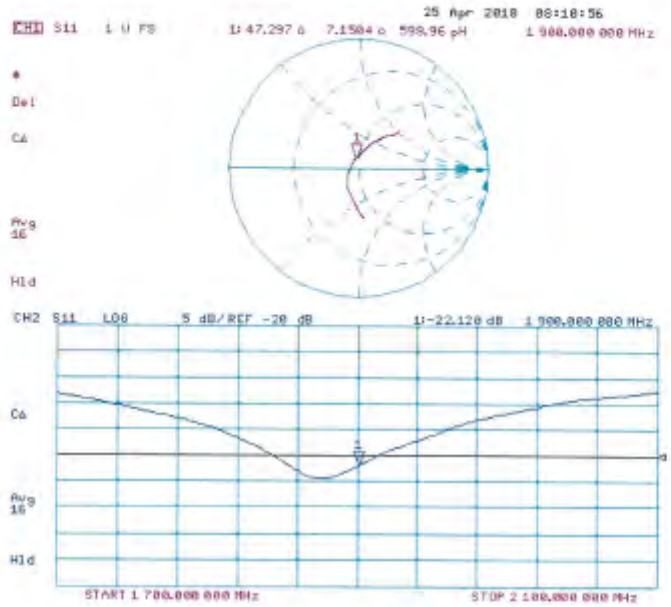
- Probe: EX3DV4 - SN7349; ConvF(8.15, 8.15, 8.15); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.6 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 17.7 W/kg
SAR(1 g) = 9.93 W/kg; SAR(10 g) = 5.3 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



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

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client SGS-TW (Auden) Certificate No: D2300V2-1023_Aug18

CALIBRATION CERTIFICATE

Object: D2300V2 - SN:1023

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

Calibration date: August 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 Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Mélin Sejic	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 24, 2018

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Certificate No: D2300V2-1023_Aug18 Page 1 of 8

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Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2300 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.5	1.67 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.2 ± 6 %	1.70 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	12.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**48.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.93 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.5 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.9	1.81 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.2 ± 6 %	1.85 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	—	—

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**47.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.86 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.2 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.6 Ω - 2.1 jΩ
Return Loss	- 33.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.4 Ω - 0.9 jΩ
Return Loss	- 26.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.171 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	March 30, 2009

DASY5 Validation Report for Head TSL

Date: 23.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

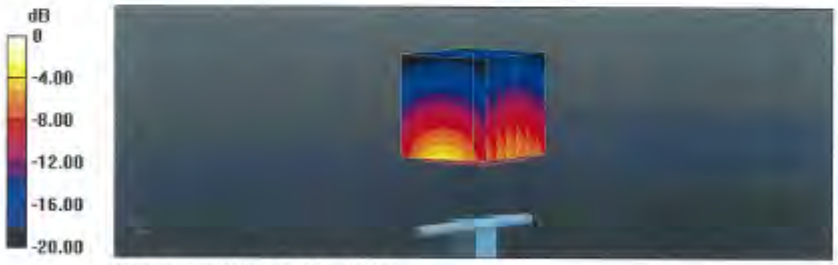
DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1023

Communication System: UID 0 - CW; Frequency: 2300 MHz
Medium parameters used: f = 2300 MHz; σ = 1.7 S/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

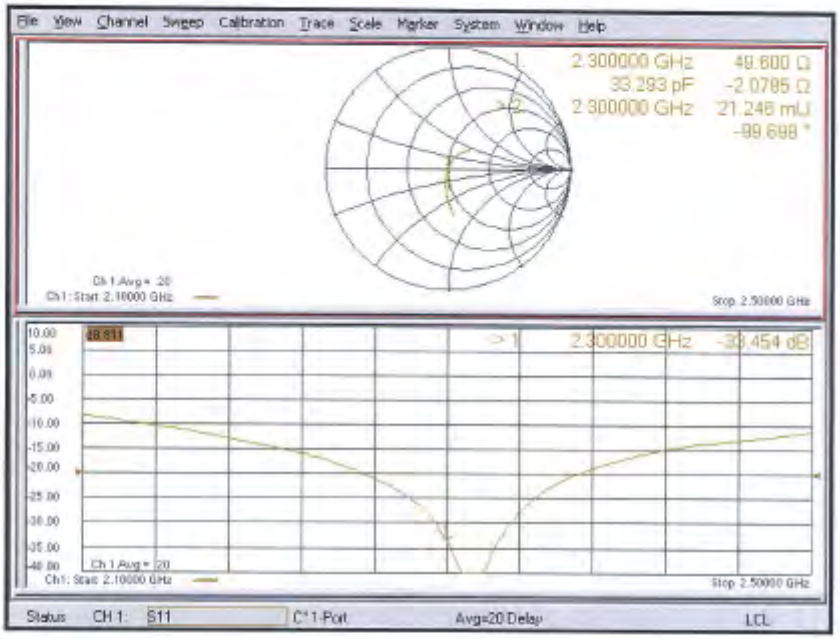
- Probe: EX3DV4 - SN7349; ConvF(8.08, 8.08, 8.08) @ 2300 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 114.4 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 23.7 W/kg
SAR(1 g) = 12.3 W/kg; SAR(10 g) = 5.93 W/kg
Maximum value of SAR (measured) = 19.8 W/kg



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

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 24.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

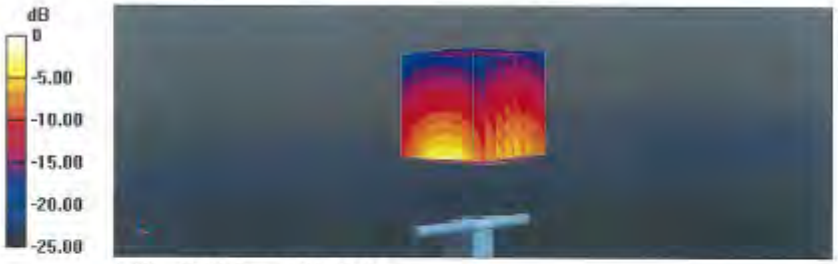
DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1023

Communication System: UID 0 - CW; Frequency: 2300 MHz
Medium parameters used: f = 2300 MHz; σ = 1.85 S/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

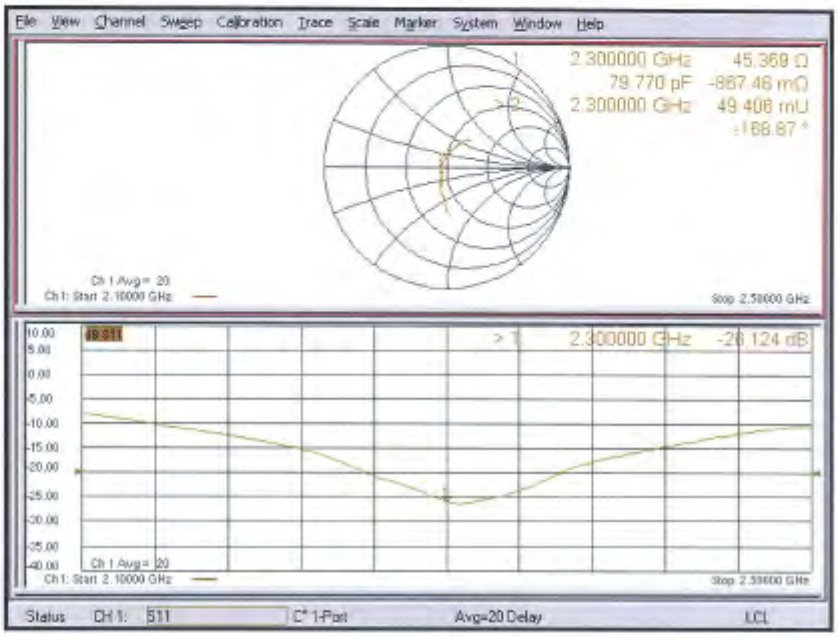
- Probe: EX3DV4 - SN7349; ConvF(8.08, 8.08, 8.08) @ 2300 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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 = 108.1 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 22.8 W/kg
SAR(1 g) = 12.1 W/kg; SAR(10 g) = 5.86 W/kg
Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.1 W/kg = 12.81 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client SGS-TW (Auden)

Certificate No: D2600V2-1005_Jan18

CALIBRATION CERTIFICATE

Object D2600V2 - SN:1005

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

Calibration date: January 17, 2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: January 17, 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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.2 ± 6 %	2.04 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**56.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.49 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.5 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.1 ± 6 %	2.20 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**54.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.3 W/kg ± 16.5 % (k=2)**

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

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

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω - 3.0 jΩ
Return Loss	- 25.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.155 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 23, 2006

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DASY5 Validation Report for Head TSL

Date: 17.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

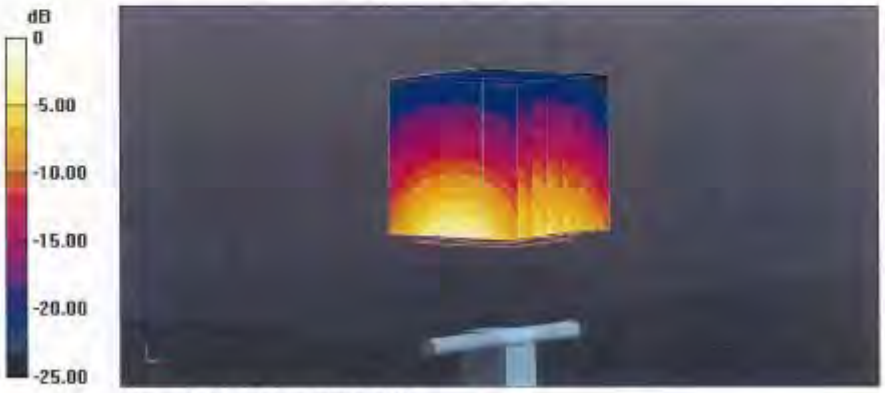
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1005

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

DASY52 Configuration:

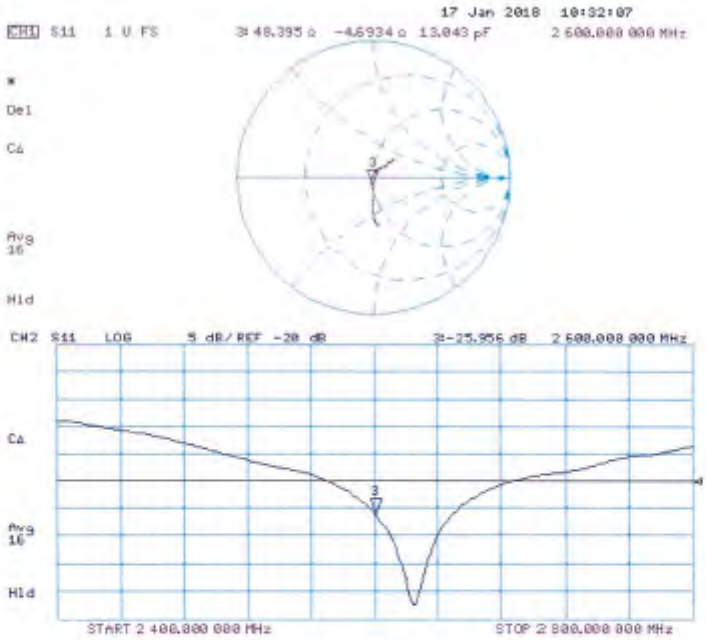
- Probe: EX3DV4 - SN7349; ConvF(7.7, 7.7, 7.7); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 118.8 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.49 W/kg
Maximum value of SAR (measured) = 24.1 W/kg



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

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 17.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

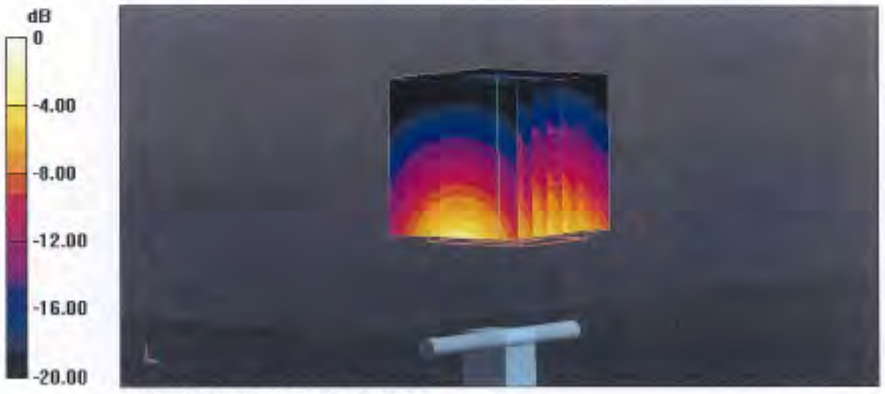
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1005

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

DASY52 Configuration:

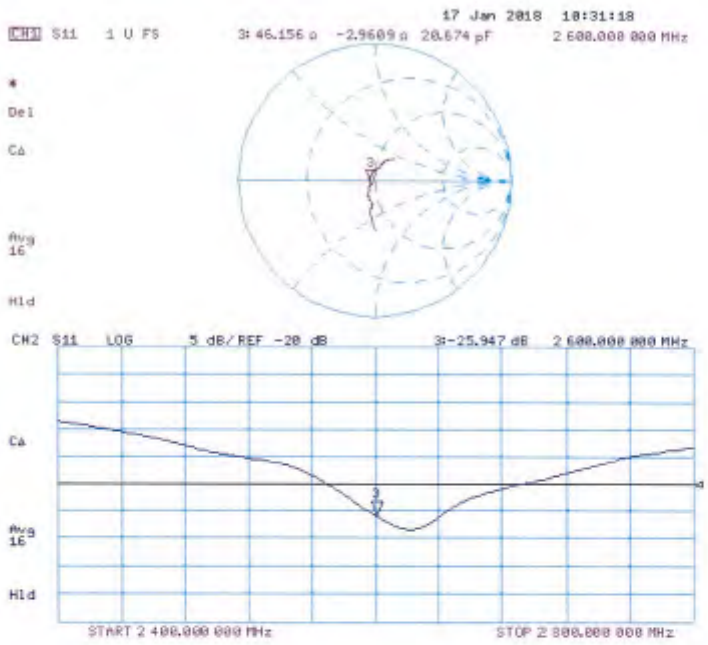
- Probe: EX3DV4 - SN7349; ConvF(7.81, 7.81, 7.81); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.0 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 28.6 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.13 W/kg
Maximum value of SAR (measured) = 22.6 W/kg



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

Impedance Measurement Plot for Body TSL



- End of report -

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