SAR TEST REPORT

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

Equipment Under Test	Notebook PC
Brand Name	CTL
Model No.	NL71CT-L
Company Name	Fibocom Wireless Inc.
Company Address	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan ShenZhen, China
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013
FCC ID	ZMOL850GL
Date of Receipt	Oct. 13, 2020
Date of Test(s)	Nov. 03, 2020 ~ Nov. 06, 2020
Date of Issue	Nov. 16, 2020

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 Ltd. Central RF Lab or testing done by SGS Taiwan Ltd. Central RF Lab in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Ltd. Central RF Lab in writing.

Signed on behalf of SGS

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

Date: Nov. 16, 2020

Revision History

Report Number	Revision	Description	Issue Date
E5/2020/A0002	Rev.00	Initial creation of document	Nov. 16, 2020

Contents

0. Guidance applied

The SAR testing method and procedure for this device is in accordance with the following standards:

IEEE/ANSI C95.1-1992

IEEE 1528-2013

KDB616217D04v01r02

KDB865664D01v01r04

KDB865664D02v01r02

KDB941225D01v03r01

KDB941225D05v02r05

KDB941225D05Av01r02

KDB447498D01v06

KDB248227D01v02r02

1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Central RF Lab	
No. 2, Keji 1st Rd., Guishan Township, Taoyuan County, 33383, Taiwan	
FCC Designation Number	TW0028
Tel	+886-2-2299-3279
Fax	+886-2-2298-0488
Internet	http://www.tw.sgs.com/

1.2 Details of Applicant

Company Name	Fibocom Wireless Inc.
Company Address	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan ShenZhen, China

1.3 Description of EUT

Equipment Under Test	Notebook PC		
Brand Name	CTL		
Model No.	NL71CT-L		
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 ☒WLAN802.11 a/b/g/n/ac(20M/40M/80M/160M) ☒Bluetooth		
Duty Cycle	WCDMA	100%	
	LTE FDD	100%	
	LTE TDD	63.3%	
	WLAN802.11 a/b/g/n/ac(20M/40M/80M/160M)	100%	
	Bluetooth	100%	
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

TX Frequency Range (MHz)	LTE TDD Band 38	2570	–	2620
	LTE TDD Band 41	2496	–	2690
	LTE FDD Band 66	1710	–	1780
	WLAN802.11 b/g/n(20M)	2412	–	2472
	WLAN802.11 n(40M)	2422	–	2462
	WLAN802.11 a/n/ac(20M) 5.2G	5180	–	5240
	WLAN802.11 n/ac(40M) 5.2G	5190	–	5230
	WLAN802.11 ac(80M) 5.2G	5210		
	WLAN802.11 ac(160M) 5.2G	5250		
	WLAN802.11 a/n/ac(20M) 5.3G	5260	–	5320
	WLAN802.11 n/ac(40M) 5.3G	5270	–	5310
	WLAN802.11 ac(80M) 5.3G	5290		
	WLAN802.11 a/n/ac(20M) 5.6G	5500	–	5720
	WLAN802.11 n/ac(40M) 5.6G	5510	–	5710
	WLAN802.11 ac(80M) 5.6G	5530	–	5690
	WLAN802.11 ac(160M) 5.6G	5570		
	WLAN802.11 a/n/ac(20M) 5.8G	5745	–	5825
	WLAN802.11 n/ac(40M) 5.8G	5755	–	5795
	WLAN802.11 ac(80M) 5.8G	5775		
	Bluetooth	2402	–	2480
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

Channel Number (ARFCN)	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
	WLAN802.11 b/g/n(20M)	1	—	13
	WLAN802.11 n(40M)	3	—	11
	WLAN802.11 a/n/ac(20M) 5.2G	36	—	48
	WLAN802.11 n/ac(40M) 5.2G	38	—	46
	WLAN802.11 ac(80M) 5.2G		42	
	WLAN802.11 ac(160M) 5.2G		50	
	WLAN802.11 a/n/ac(20M) 5.3G	52	—	64
	WLAN802.11 n/ac(40M) 5.3G	54	—	62
	WLAN802.11 ac(80M) 5.3G	58		
	WLAN802.11 a/n/ac(20M) 5.6G	100	—	144
	WLAN802.11 n/ac(40M) 5.6G	102	—	142
	WLAN802.11 ac(80M) 5.6G	106	—	138
	WLAN802.11 ac(160M) 5.6G		114	
	WLAN802.11 a/n/ac(20M) 5.8G	149	—	165
	WLAN802.11 n/ac(40M) 5.8G	151	—	159
	WLAN802.11 ac(80M) 5.8G		155	
	Bluetooth	0	—	78

Max. SAR (1 g) (Unit: W/Kg)				
Band	Measured	Reported	Channel	Position
WCDMA Band II	0.02	0.02	9400	Bottom side
WCDMA Band IV	0.01	0.01	1312	Bottom side
WCDMA Band V	0.01	0.01	4183	Bottom side
LTE FDD Band 2	0.01	0.02	18900	Bottom side
LTE FDD Band 4	0.01	0.01	20050	Bottom side
LTE FDD Band 5	0.01	0.02	20525	Bottom side
LTE FDD Band 7	0.01	0.01	21350	Bottom side
LTE FDD Band 12	0.01	0.02	23130	Bottom side
LTE FDD Band 13	0.02	0.02	23230	Bottom side
LTE FDD Band 17	0.02	0.02	23790	Bottom side
LTE FDD Band 26	0.01	0.01	26865	Bottom side
LTE FDD Band 30	0.03	0.03	37710	Bottom side
LTE TDD Band 38	0.01	0.01	38150	Bottom side
LTE TDD Band 41	0.01	0.01	41490	Bottom side
LTE FDD Band 66	0.01	0.01	132072	Bottom side

Antenna Information

WWAN

Gain table(dBi)	
Vendor	WNC
Part Number	DQ6615G1600(81EAA615.G16)
Band	WWAN
WCDMA B2	2.58
WCDMA B4	-0.27
WCDMA B5	-1.25
LTE B2	2.58
LTE B4	-0.27
LTE B5	-1.25
LTE B7	1.85
LTE B12	-0.49
LTE B13	-3.01
LTE B17	-0.49
LTE B26	-1.25
LTE B30	2.74
LTE B38	1.85
LTE B41	1.9
LTE B66	-0.04

Tx5-WCDMA Band II / Band IV / Band V - HSDPA / HSUPA 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)		**24.50**		
3GPP Rel 99	RMC 12.2Kbps	24.01	24.05	24.32
3GPP Rel 5	HSDPA Subtest-1	23.81	23.83	24.20
	HSDPA Subtest-2	22.85	22.86	23.20
	HSDPA Subtest-3	22.31	22.37	22.68
	HSDPA Subtest-4	22.05	22.10	22.41
3GPP Rel 6	HSUPA Subtest-1	22.80	22.87	23.18
	HSUPA Subtest-2	20.59	20.63	20.92
	HSUPA Subtest-3	21.35	21.35	21.66
	HSUPA Subtest-4	20.89	20.85	21.19
	HSUPA Subtest-5	22.89	22.91	23.22
3GPP Rel 7	HSPA+	24.00	23.86	23.87
3GPP Rel 8	DC-HSDPA Subtest-1	23.85	23.92	23.83
	DC-HSDPA Subtest-2	23.96	23.84	23.84
	DC-HSDPA Subtest-3	23.41	23.47	23.38
	DC-HSDPA Subtest-4	23.48	23.46	23.37
Band		WCDMA IV		
TX Channel		1312	1412	1513
Frequency (MHz)		1712.4	1732.4	1752.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**24.50**		
3GPP Rel 99	RMC 12.2Kbps	24.01	24.07	24.46
3GPP Rel 5	HSDPA Subtest-1	23.86	23.89	24.44
	HSDPA Subtest-2	22.91	22.87	23.46
	HSDPA Subtest-3	22.37	22.39	22.98
	HSDPA Subtest-4	22.16	22.18	22.69
3GPP Rel 6	HSUPA Subtest-1	22.89	22.97	23.38
	HSUPA Subtest-2	20.70	20.79	21.19
	HSUPA Subtest-3	21.42	21.46	21.89
	HSUPA Subtest-4	21.01	21.03	21.47
	HSUPA Subtest-5	22.91	23.04	23.45
3GPP Rel 7	HSPA+	23.90	23.90	23.92
3GPP Rel 8	DC-HSDPA Subtest-1	23.83	23.87	23.90
	DC-HSDPA Subtest-2	23.92	23.91	23.81
	DC-HSDPA Subtest-3	23.44	23.49	23.49
	DC-HSDPA Subtest-4	23.43	23.38	23.40
Band		WCDMA V		
TX Channel		4132	4183	4233
Frequency (MHz)		826.4	836.6	846.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		**24.50**		
3GPP Rel 99	RMC 12.2Kbps	23.84	23.94	23.75
3GPP Rel 5	HSDPA Subtest-1	23.69	23.89	23.54
	HSDPA Subtest-2	22.85	23.51	22.76
	HSDPA Subtest-3	22.42	22.99	22.24
	HSDPA Subtest-4	22.12	22.75	22.07
3GPP Rel 6	HSUPA Subtest-1	22.81	23.42	22.60
	HSUPA Subtest-2	20.56	21.23	20.36
	HSUPA Subtest-3	21.34	21.99	21.11
	HSUPA Subtest-4	20.84	21.49	20.71
	HSUPA Subtest-5	22.85	23.52	22.74
3GPP Rel 7	HSPA+	23.72	23.61	23.65
3GPP Rel 8	DC-HSDPA Subtest-1	23.75	23.71	23.61
	DC-HSDPA Subtest-2	23.69	23.61	23.72
	DC-HSDPA Subtest-3	23.19	23.21	23.09
	DC-HSDPA Subtest-4	23.10	23.24	23.20

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 38 / Band 41 / Band 66 power table:

LTE Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1860	1880	1900		
Channel				18700	18900	19100		
20	QPSK	1	0	23.47	23.31	23.42	24.00	0
		1	50	23.08	23.20	23.26	24.00	0
		1	99	23.18	23.29	23.28	24.00	0
		50	0	22.17	22.12	22.26	23.00	0-1
		50	25	22.05	22.13	22.45	23.00	0-1
		50	50	22.15	22.18	22.58	23.00	0-1
		100	0	22.22	22.25	22.59	23.00	0-1
	16-QAM	1	0	22.87	22.29	22.15	23.00	0-1
		1	50	22.60	22.32	22.55	23.00	0-1
		1	99	22.97	22.39	22.62	23.00	0-1
		50	0	21.20	21.10	21.25	22.00	0-2
		50	25	21.06	21.16	21.40	22.00	0-2
		50	50	21.14	21.18	21.65	22.00	0-2
		100	0	21.20	21.27	21.71	22.00	0-2
	64-QAM	1	0	21.80	21.28	21.06	22.00	0-2
		1	50	21.56	21.28	21.53	22.00	0-2
		1	99	21.88	21.38	21.57	22.00	0-2
		50	0	20.17	20.05	20.22	21.00	0-3
		50	25	20.01	20.07	20.39	21.00	0-3
		50	50	20.11	20.12	20.63	21.00	0-3
		100	0	20.12	20.24	20.62	21.00	0-3
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1857.5	1880	1902.5		
Channel				18675	18900	19125		
15	QPSK	1	0	23.39	23.23	23.42	24.00	0
		1	36	23.06	23.16	23.19	24.00	0
		1	74	23.13	23.25	23.18	24.00	0
		36	0	22.09	22.04	22.22	23.00	0-1
		36	18	22.01	22.12	22.45	23.00	0-1
		36	37	22.12	22.13	22.49	23.00	0-1
		75	0	22.14	22.15	22.57	23.00	0-1
	16-QAM	1	0	22.84	22.22	22.09	23.00	0-1
		1	36	22.52	22.24	22.55	23.00	0-1
		1	74	22.90	22.35	22.53	23.00	0-1
		36	0	21.12	21.02	21.18	22.00	0-2
		36	18	20.96	21.13	21.33	22.00	0-2
		36	37	21.14	21.16	21.57	22.00	0-2
		75	0	21.19	21.27	21.62	22.00	0-2
	64-QAM	1	0	21.75	21.25	21.03	22.00	0-2
		1	36	21.46	21.25	21.46	22.00	0-2
		1	74	21.79	21.32	21.53	22.00	0-2
		36	0	20.15	20.03	20.13	21.00	0-3
		36	18	19.93	19.98	20.34	21.00	0-3
		36	37	20.11	20.07	20.58	21.00	0-3
		75	0	20.05	20.23	20.60	21.00	0-3

LTE Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1855	1880	1905		
Channel				18650	18900	19150		
10	QPSK	1	0	23.39	23.24	23.32	24.00	0
		1	25	23.02	23.18	23.21	24.00	0
		1	49	23.10	23.28	23.20	24.00	0
		25	0	22.14	22.10	22.22	23.00	0-1
		25	12	21.98	22.12	22.43	23.00	0-1
		25	25	22.13	22.11	22.55	23.00	0-1
		50	0	22.20	22.16	22.51	23.00	0-1
	16-QAM	1	0	22.85	22.28	22.11	23.00	0-1
		1	25	22.53	22.26	22.49	23.00	0-1
		1	49	22.92	22.38	22.59	23.00	0-1
		25	0	21.11	21.01	21.20	22.00	0-2
		25	12	21.00	21.07	21.34	22.00	0-2
		25	25	21.05	21.12	21.63	22.00	0-2
		50	0	21.12	21.20	21.68	22.00	0-2
	64-QAM	1	0	21.70	21.18	21.02	22.00	0-2
		1	25	21.53	21.27	21.48	22.00	0-2
		1	49	21.80	21.34	21.48	22.00	0-2
		25	0	20.15	20.04	20.20	21.00	0-3
		25	12	19.92	20.05	20.35	21.00	0-3
		25	25	20.05	20.06	20.62	21.00	0-3
		50	0	20.09	20.16	20.56	21.00	0-3
Frequency (MHz)				1852.5	1880	1907.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				18625	18900	19175		
5	QPSK	1	0	23.30	23.20	23.28	24.00	0
		1	12	22.92	23.17	23.12	24.00	0
		1	24	23.09	23.23	23.15	24.00	0
		12	0	22.13	22.01	22.20	23.00	0-1
		12	6	21.96	22.03	22.43	23.00	0-1
		12	13	22.08	22.02	22.49	23.00	0-1
		25	0	22.19	22.08	22.50	23.00	0-1
	16-QAM	1	0	22.85	22.22	22.08	23.00	0-1
		1	12	22.53	22.23	22.45	23.00	0-1
		1	24	22.87	22.36	22.59	23.00	0-1
		12	0	21.04	20.97	21.19	22.00	0-2
		12	6	20.97	21.04	21.31	22.00	0-2
		12	13	21.04	21.10	21.61	22.00	0-2
		25	0	21.10	21.15	21.64	22.00	0-2
	64-QAM	1	0	21.70	21.16	20.99	22.00	0-2
		1	12	21.46	21.25	21.44	22.00	0-2
		1	24	21.80	21.24	21.44	22.00	0-2
		12	0	20.15	19.98	20.13	21.00	0-3
		12	6	19.86	19.97	20.33	21.00	0-3
		12	13	19.98	20.04	20.55	21.00	0-3
		25	0	20.09	20.09	20.53	21.00	0-3

LTE Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1720	1732.5	1745		
Channel				20050	20175	20300		
20	QPSK	1	0	23.37	23.39	23.21	24.00	0
		1	50	23.44	23.20	23.48	24.00	0
		1	99	23.33	23.40	23.84	24.00	0
		50	0	22.40	22.20	22.28	23.00	0-1
		50	25	22.32	22.15	22.54	23.00	0-1
		50	50	22.22	22.15	22.82	23.00	0-1
		100	0	22.43	22.29	22.74	23.00	0-1
	16-QAM	1	0	22.32	22.42	22.27	23.00	0-1
		1	50	22.60	22.52	22.73	23.00	0-1
		1	99	22.17	22.57	22.73	23.00	0-1
		50	0	21.43	21.14	21.30	22.00	0-2
		50	25	21.33	21.23	21.59	22.00	0-2
		50	50	21.26	21.19	21.76	22.00	0-2
		100	0	21.37	21.31	21.70	22.00	0-2
	64-QAM	1	0	21.27	21.38	21.18	22.00	0-2
		1	50	21.50	21.44	21.64	22.00	0-2
		1	99	21.09	21.49	21.64	22.00	0-2
		50	0	20.39	20.06	20.29	21.00	0-3
		50	25	20.25	20.14	20.55	21.00	0-3
		50	50	20.18	20.14	20.72	21.00	0-3
		100	0	20.30	20.30	20.65	21.00	0-3
Frequency (MHz)				1717.5	1732.5	1747.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				20025	20175	20325		
15	QPSK	1	0	23.31	23.32	23.16	24.00	0
		1	36	23.40	23.12	23.45	24.00	0
		1	74	23.33	23.37	23.80	24.00	0
		36	0	22.34	22.19	22.19	23.00	0-1
		36	18	22.30	22.08	22.50	23.00	0-1
		36	37	22.18	22.12	22.72	23.00	0-1
		75	0	22.35	22.21	22.73	23.00	0-1
	16-QAM	1	0	22.22	22.38	22.25	23.00	0-1
		1	36	22.50	22.43	22.73	23.00	0-1
		1	74	22.13	22.49	22.64	23.00	0-1
		36	0	21.35	21.13	21.21	22.00	0-2
		36	18	21.30	21.21	21.58	22.00	0-2
		36	37	21.25	21.14	21.70	22.00	0-2
		75	0	21.28	21.22	21.69	22.00	0-2
	64-QAM	1	0	21.23	21.38	21.15	22.00	0-2
		1	36	21.45	21.41	21.56	22.00	0-2
		1	74	21.07	21.47	21.63	22.00	0-2
		36	0	20.30	19.99	20.19	21.00	0-3
		36	18	20.19	20.09	20.53	21.00	0-3
		36	37	20.12	20.06	20.65	21.00	0-3
		75	0	20.26	20.28	20.64	21.00	0-3

LTE Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1715	1732.5	1750		
Channel				20000	20175	20350		
10	QPSK	1	0	23.27	23.35	23.12	24.00	0
		1	25	23.35	23.11	23.46	24.00	0
		1	49	23.31	23.38	23.75	24.00	0
		25	0	22.39	22.13	22.28	23.00	0-1
		25	12	22.27	22.07	22.50	23.00	0-1
		25	25	22.21	22.07	22.73	23.00	0-1
		50	0	22.37	22.26	22.74	23.00	0-1
	16-QAM	1	0	22.28	22.35	22.22	23.00	0-1
		1	25	22.57	22.44	22.64	23.00	0-1
		1	49	22.11	22.51	22.69	23.00	0-1
		25	0	21.42	21.12	21.24	22.00	0-2
		25	12	21.24	21.16	21.52	22.00	0-2
		25	25	21.26	21.15	21.68	22.00	0-2
		50	0	21.36	21.24	21.69	22.00	0-2
	64-QAM	1	0	21.21	21.28	21.17	22.00	0-2
		1	25	21.44	21.38	21.57	22.00	0-2
		1	49	21.05	21.45	21.63	22.00	0-2
		25	0	20.37	19.96	20.24	21.00	0-3
		25	12	20.21	20.10	20.48	21.00	0-3
		25	25	20.11	20.10	20.66	21.00	0-3
		50	0	20.25	20.27	20.64	21.00	0-3
Frequency (MHz)				1712.5	1732.5	1752.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				19975	20175	20375		
5	QPSK	1	0	23.26	23.25	23.04	24.00	0
		1	12	23.31	23.10	23.42	24.00	0
		1	24	23.27	23.36	23.72	24.00	0
		12	0	22.35	22.09	22.23	23.00	0-1
		12	6	22.18	22.04	22.44	23.00	0-1
		12	13	22.19	22.03	22.67	23.00	0-1
		25	0	22.33	22.25	22.65	23.00	0-1
	16-QAM	1	0	22.23	22.32	22.19	23.00	0-1
		1	12	22.54	22.39	22.60	23.00	0-1
		1	24	22.05	22.47	22.60	23.00	0-1
		12	0	21.35	21.10	21.15	22.00	0-2
		12	6	21.21	21.08	21.44	22.00	0-2
		12	13	21.23	21.07	21.64	22.00	0-2
		25	0	21.36	21.19	21.68	22.00	0-2
	64-QAM	1	0	21.19	21.22	21.17	22.00	0-2
		1	12	21.39	21.35	21.57	22.00	0-2
		1	24	21.03	21.37	21.57	22.00	0-2
		12	0	20.36	19.86	20.16	21.00	0-3
		12	6	20.21	20.04	20.45	21.00	0-3
		12	13	20.01	20.09	20.61	21.00	0-3
		25	0	20.17	20.20	20.54	21.00	0-3

LTE Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
Channel				19965	20175	20385		
3	QPSK	1	0	23.26	23.27	23.03	24.00	0
		1	7	23.32	23.05	23.37	24.00	0
		1	14	23.26	23.35	23.66	24.00	0
		8	0	22.33	22.09	22.28	23.00	0-1
		8	4	22.21	22.05	22.44	23.00	0-1
		8	7	22.16	22.01	22.65	23.00	0-1
		15	0	22.35	22.19	22.66	23.00	0-1
	16-QAM	1	0	22.27	22.30	22.18	23.00	0-1
		1	7	22.52	22.36	22.63	23.00	0-1
		1	14	22.10	22.47	22.62	23.00	0-1
		8	0	21.37	21.08	21.21	22.00	0-2
		8	4	21.15	21.06	21.43	22.00	0-2
		8	7	21.17	21.11	21.65	22.00	0-2
		15	0	21.29	21.18	21.68	22.00	0-2
	64-QAM	1	0	21.16	21.28	21.10	22.00	0-2
		1	7	21.40	21.36	21.56	22.00	0-2
		1	14	20.97	21.39	21.60	22.00	0-2
		8	0	20.34	19.94	20.15	21.00	0-3
		8	4	20.12	20.05	20.43	21.00	0-3
		8	7	20.10	20.09	20.57	21.00	0-3
		15	0	20.20	20.25	20.60	21.00	0-3
Frequency (MHz)				1710.7	1732.5	1754.3	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				19957	20175	20393		
1.4	QPSK	1	0	23.18	23.22	22.99	24.00	0
		1	2	23.24	22.97	23.37	24.00	0
		1	5	23.22	23.31	23.61	24.00	0
		3	0	22.30	22.09	22.25	24.00	0.00
		3	2	22.12	22.00	22.37	24.00	0.00
		3	3	22.12	22.02	22.56	24.00	0.00
		6	0	22.29	22.17	22.64	23.00	0-1
	16-QAM	1	0	22.26	22.25	22.09	23.00	0-1
		1	2	22.50	22.31	22.55	23.00	0-1
		1	5	22.08	22.43	22.55	23.00	0-1
		3	0	21.28	21.03	21.15	23.00	0-1
		3	2	21.15	21.01	21.40	23.00	0-1
		3	3	21.14	21.04	21.57	23.00	0-1
		6	0	21.26	21.13	21.58	22.00	0-2
	64-QAM	1	0	21.09	21.28	21.06	22.00	0-2
		1	2	21.38	21.30	21.51	22.00	0-2
		1	5	20.88	21.30	21.52	22.00	0-2
		3	0	20.24	20.04	20.05	22.00	0-2
		3	2	20.04	20.00	20.42	22.00	0-2
		3	3	20.03	20.05	20.51	22.00	0-2
		6	0	20.16	20.17	20.50	21.00	0-3

LTE Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				829	836.5	844		
Channel				20450	20525	20600		
10	QPSK	1	0	23.45	23.51	23.22	24.00	0
		1	25	23.42	23.28	23.21	24.00	0
		1	49	23.29	23.29	23.20	24.00	0
		25	0	22.41	22.42	22.29	23.00	0-1
		25	12	22.39	22.37	22.24	23.00	0-1
		25	25	22.55	22.27	22.10	23.00	0-1
		50	0	22.41	22.29	22.18	23.00	0-1
	16-QAM	1	0	22.92	22.61	22.81	23.00	0-1
		1	25	22.56	22.82	22.38	23.00	0-1
		1	49	22.95	22.85	22.30	23.00	0-1
		25	0	21.38	21.48	21.22	22.00	0-2
		25	12	21.52	21.38	21.18	22.00	0-2
		25	25	21.65	21.40	21.16	22.00	0-2
		50	0	21.59	21.38	21.26	22.00	0-2
	64-QAM	1	0	21.83	21.51	21.80	22.00	0-2
		1	25	21.47	21.73	21.33	22.00	0-2
		1	49	21.97	21.75	21.24	22.00	0-2
		25	0	20.38	20.45	20.20	21.00	0-3
		25	12	20.42	20.29	20.13	21.00	0-3
		25	25	20.60	20.38	20.15	21.00	0-3
		50	0	20.55	20.34	20.18	21.00	0-3
Frequency (MHz)				826.5	836.5	846.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				20425	20525	20625		
5	QPSK	1	0	23.46	23.40	23.12	24.00	0
		1	12	23.37	23.20	23.20	24.00	0
		1	24	23.29	23.25	23.15	24.00	0
		12	0	22.34	22.40	22.21	23.00	0-1
		12	6	22.35	22.33	22.19	23.00	0-1
		12	13	22.46	22.27	22.09	23.00	0-1
		25	0	22.37	22.24	22.14	23.00	0-1
	16-QAM	1	0	22.87	22.59	22.72	23.00	0-1
		1	12	22.50	22.79	22.32	23.00	0-1
		1	24	22.95	22.85	22.28	23.00	0-1
		12	0	21.37	21.39	21.13	22.00	0-2
		12	6	21.44	21.32	21.10	22.00	0-2
		12	13	21.60	21.39	21.07	22.00	0-2
		25	0	21.58	21.33	21.17	22.00	0-2
	64-QAM	1	0	21.82	21.43	21.76	22.00	0-2
		1	12	21.46	21.71	21.32	22.00	0-2
		1	24	21.96	21.75	21.15	22.00	0-2
		12	0	20.29	20.42	20.17	21.00	0-3
		12	6	20.38	20.22	20.10	21.00	0-3
		12	13	20.57	20.30	20.09	21.00	0-3
		25	0	20.48	20.28	20.18	21.00	0-3

LTE Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				825.5	836.5	847.5		
Channel				20415	20525	20635		
3	QPSK	1	0	23.37	23.41	23.17	24.00	0
		1	7	23.36	23.22	23.13	24.00	0
		1	14	23.25	23.24	23.18	24.00	0
		8	0	22.35	22.32	22.27	23.00	0-1
		8	4	22.36	22.29	22.21	23.00	0-1
		8	7	22.51	22.20	22.01	23.00	0-1
		15	0	22.37	22.19	22.11	23.00	0-1
	16-QAM	1	0	22.91	22.57	22.73	23.00	0-1
		1	7	22.50	22.81	22.36	23.00	0-1
		1	14	22.99	22.81	22.26	23.00	0-1
		8	0	21.38	21.40	21.12	22.00	0-2
		8	4	21.44	21.30	21.14	22.00	0-2
		8	7	21.56	21.38	21.12	22.00	0-2
		15	0	21.52	21.32	21.20	22.00	0-2
	64-QAM	1	0	21.79	21.47	21.71	22.00	0-2
		1	7	21.41	21.71	21.25	22.00	0-2
		1	14	22.00	21.73	21.19	22.00	0-2
		8	0	20.29	20.37	20.13	21.00	0-3
		8	4	20.40	20.23	20.11	21.00	0-3
		8	7	20.52	20.32	20.12	21.00	0-3
		15	0	20.46	20.31	20.17	21.00	0-3
Frequency (MHz)				824.7	836.5	848.3	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				20407	20525	20643		
1.4	QPSK	1	0	23.30	23.35	23.10	24.00	0
		1	2	23.36	23.21	23.12	24.00	0
		1	5	23.17	23.20	23.18	24.00	0
		3	0	22.26	22.23	22.18	23.00	0-1
		3	2	22.30	22.22	22.14	23.00	0-1
		3	3	22.43	22.15	22.08	23.00	0-1
		6	0	22.34	22.15	22.08	23.00	0-1
	16-QAM	1	0	22.86	22.54	22.67	23.00	0-1
		1	2	22.41	22.74	22.28	23.00	0-1
		1	5	22.91	22.71	22.18	23.00	0-1
		3	0	21.31	21.38	21.02	22.00	0-2
		3	2	21.36	21.29	21.07	22.00	0-2
		3	3	21.50	21.31	21.08	22.00	0-2
		6	0	21.50	21.30	21.10	22.00	0-2
	64-QAM	1	0	21.71	21.47	21.67	22.00	0-2
		1	2	21.33	21.66	21.19	22.00	0-2
		1	5	21.96	21.68	21.11	22.00	0-2
		3	0	20.27	20.34	20.03	21.00	0-3
		3	2	20.34	20.16	20.04	21.00	0-3
		3	3	20.50	20.22	20.05	21.00	0-3
		6	0	20.38	20.23	20.09	21.00	0-3

LTE Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2510	2535	2560		
Channel				20850	21100	21350		
20	QPSK	1	0	22.98	22.85	22.82	24.00	0
		1	50	22.89	22.84	22.80	24.00	0
		1	99	23.10	23.02	22.97	24.00	0
		50	0	21.99	21.90	21.92	23.00	0-1
		50	25	21.93	21.87	21.94	23.00	0-1
		50	50	22.04	21.98	21.97	23.00	0-1
		100	0	22.08	21.96	22.05	23.00	0-1
	16-QAM	1	0	21.94	22.05	22.32	23.00	0-1
		1	50	22.30	22.08	22.10	23.00	0-1
		1	99	22.28	21.91	22.22	23.00	0-1
		50	0	21.00	20.92	20.89	22.00	0-2
		50	25	21.02	20.93	20.97	22.00	0-2
		50	50	21.10	20.98	21.11	22.00	0-2
		100	0	21.09	21.04	21.11	22.00	0-2
	64-QAM	1	0	20.88	21.00	21.31	22.00	0-2
		1	50	21.26	21.08	21.03	22.00	0-2
		1	99	21.20	20.89	21.16	22.00	0-2
		50	0	19.99	19.85	19.87	21.00	0-3
		50	25	20.02	19.92	19.94	21.00	0-3
		50	50	20.08	19.95	20.07	21.00	0-3
		100	0	20.03	20.01	20.05	21.00	0-3
Frequency (MHz)				2507.5	2535	2562.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				20825	21100	21375		
15	QPSK	1	0	22.94	22.79	22.76	24.00	0
		1	36	22.88	22.75	22.79	24.00	0
		1	74	23.04	22.94	22.95	24.00	0
		36	0	21.92	21.80	21.87	23.00	0-1
		36	18	21.84	21.77	21.94	23.00	0-1
		36	37	22.00	21.88	21.92	23.00	0-1
		75	0	21.99	21.94	22.05	23.00	0-1
	16-QAM	1	0	21.91	22.00	22.24	23.00	0-1
		1	36	22.28	22.01	22.01	23.00	0-1
		1	74	22.25	21.87	22.13	23.00	0-1
		36	0	20.94	20.83	20.85	22.00	0-2
		36	18	21.00	20.92	20.89	22.00	0-2
		36	37	21.10	20.88	21.02	22.00	0-2
		75	0	21.07	21.02	21.09	22.00	0-2
	64-QAM	1	0	20.81	20.92	21.25	22.00	0-2
		1	36	21.20	21.01	20.96	22.00	0-2
		1	74	21.15	20.83	21.11	22.00	0-2
		36	0	19.97	19.80	19.78	21.00	0-3
		36	18	20.00	19.88	19.94	21.00	0-3
		36	37	20.05	19.89	20.01	21.00	0-3
		75	0	19.94	19.97	20.02	21.00	0-3

LTE Band 7								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2505	2535	2565		
Channel				20800	21100	21400		
10	QPSK	1	0	23.01	22.79	22.79	24.00	0
		1	25	22.84	22.79	22.72	24.00	0
		1	49	23.00	22.94	22.91	24.00	0
		25	0	21.91	21.85	21.83	23.00	0-1
		25	12	21.90	21.79	21.88	23.00	0-1
		25	25	22.02	21.95	21.90	23.00	0-1
		50	0	22.05	21.86	22.01	23.00	0-1
	16-QAM	1	0	21.94	22.00	22.28	23.00	0-1
		1	25	22.20	22.06	22.04	23.00	0-1
		1	49	22.27	21.89	22.20	23.00	0-1
		25	0	20.94	20.85	20.87	22.00	0-2
		25	12	20.98	20.90	20.91	22.00	0-2
		25	25	21.03	20.97	21.04	22.00	0-2
		50	0	21.08	20.98	21.01	22.00	0-2
	64-QAM	1	0	20.83	20.95	21.29	22.00	0-2
		1	25	21.25	21.03	21.02	22.00	0-2
		1	49	21.20	20.80	21.15	22.00	0-2
		25	0	19.91	19.81	19.82	21.00	0-3
		25	12	19.94	19.84	19.89	21.00	0-3
		25	25	19.99	19.88	20.04	21.00	0-3
		50	0	20.00	19.92	19.96	21.00	0-3
Frequency (MHz)				2502.5	2535	2567.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				20775	21100	21425		
5	QPSK	1	0	22.91	22.70	22.70	24.00	0
		1	12	22.78	22.78	22.62	24.00	0
		1	24	22.93	22.91	22.95	24.00	0
		12	0	21.82	21.75	21.79	23.00	0-1
		12	6	21.89	21.74	21.86	23.00	0-1
		12	13	21.98	21.94	21.82	23.00	0-1
		25	0	22.03	21.84	21.95	23.00	0-1
	16-QAM	1	0	21.93	21.90	22.26	23.00	0-1
		1	12	22.16	22.02	22.00	23.00	0-1
		1	24	22.19	21.81	22.19	23.00	0-1
		12	0	20.92	20.76	20.78	22.00	0-2
		12	6	20.91	20.84	20.85	22.00	0-2
		12	13	20.99	20.89	20.95	22.00	0-2
		25	0	21.00	20.89	20.93	22.00	0-2
	64-QAM	1	0	20.82	20.88	21.26	22.00	0-2
		1	12	21.19	20.95	20.97	22.00	0-2
		1	24	21.15	20.78	21.12	22.00	0-2
		12	0	19.82	19.72	19.77	21.00	0-3
		12	6	19.88	19.81	19.86	21.00	0-3
		12	13	19.96	19.88	20.03	21.00	0-3
		25	0	19.92	19.89	19.94	21.00	0-3

LTE Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				704	707.5	711		
Channel				23060	23095	23130		
10	QPSK	1	0	23.25	23.11	23.01	24.00	0
		1	25	23.13	23.18	23.21	24.00	0
		1	49	23.29	23.31	23.10	24.00	0
		25	0	22.16	22.13	22.17	23.00	0-1
		25	12	22.13	22.18	22.06	23.00	0-1
		25	25	22.26	22.34	22.08	23.00	0-1
		50	0	22.34	22.23	22.19	23.00	0-1
	16-QAM	1	0	22.73	22.18	22.16	23.00	0-1
		1	25	22.52	22.48	22.66	23.00	0-1
		1	49	22.82	22.73	22.64	23.00	0-1
		25	0	21.25	21.18	21.09	22.00	0-2
		25	12	21.29	21.33	21.28	22.00	0-2
		25	25	21.35	21.35	21.21	22.00	0-2
		50	0	21.33	21.30	21.38	22.00	0-2
	64-QAM	1	0	21.68	21.08	21.09	22.00	0-2
		1	25	21.44	21.47	21.59	22.00	0-2
		1	49	21.80	21.66	21.56	22.00	0-2
		25	0	20.19	20.14	20.02	21.00	0-3
		25	12	20.23	20.31	20.23	21.00	0-3
		25	25	20.33	20.35	20.15	21.00	0-3
		50	0	20.28	20.21	20.32	21.00	0-3
Frequency (MHz)				701.5	707.5	713.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				23035	23095	23155		
5	QPSK	1	0	23.15	23.10	22.98	24.00	0
		1	12	23.11	23.08	23.13	24.00	0
		1	24	23.29	23.27	23.08	24.00	0
		12	0	22.11	22.11	22.16	23.00	0-1
		12	6	22.13	22.09	22.04	23.00	0-1
		12	13	22.23	22.24	22.05	23.00	0-1
		25	0	22.26	22.20	22.13	23.00	0-1
	16-QAM	1	0	22.68	22.08	22.13	23.00	0-1
		1	12	22.51	22.42	22.60	23.00	0-1
		1	24	22.74	22.73	22.56	23.00	0-1
		12	0	21.15	21.10	21.06	22.00	0-2
		12	6	21.23	21.26	21.20	22.00	0-2
		12	13	21.29	21.33	21.14	22.00	0-2
		25	0	21.27	21.28	21.30	22.00	0-2
	64-QAM	1	0	21.60	21.01	21.07	22.00	0-2
		1	12	21.41	21.39	21.53	22.00	0-2
		1	24	21.75	21.58	21.54	22.00	0-2
		12	0	20.14	20.07	20.02	21.00	0-3
		12	6	20.20	20.29	20.14	21.00	0-3
		12	13	20.32	20.26	20.06	21.00	0-3
		25	0	20.21	20.14	20.23	21.00	0-3

LTE Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				700.5	707.5	714.5		
Channel				23025	23095	23165		
3	QPSK	1	0	23.22	23.04	23.01	24.00	0
		1	7	23.03	23.15	23.21	24.00	0
		1	14	23.26	23.25	23.08	24.00	0
		8	0	22.13	22.12	22.07	23.00	0-1
		8	4	22.10	22.14	22.05	23.00	0-1
		8	7	22.20	22.31	22.02	23.00	0-1
		15	0	22.33	22.16	22.16	23.00	0-1
	16-QAM	1	0	22.67	22.14	22.12	23.00	0-1
		1	7	22.46	22.46	22.59	23.00	0-1
		1	14	22.79	22.71	22.57	23.00	0-1
		8	0	21.15	21.18	21.04	22.00	0-2
		8	4	21.25	21.30	21.23	22.00	0-2
		8	7	21.29	21.31	21.11	22.00	0-2
		15	0	21.33	21.26	21.30	22.00	0-2
	64-QAM	1	0	21.64	21.04	21.04	22.00	0-2
		1	7	21.35	21.47	21.59	22.00	0-2
		1	14	21.75	21.62	21.51	22.00	0-2
		8	0	20.18	20.13	20.01	21.00	0-3
		8	4	20.15	20.23	20.22	21.00	0-3
		8	7	20.24	20.27	20.14	21.00	0-3
		15	0	20.22	20.16	20.31	21.00	0-3
Frequency (MHz)				699.7	707.5	715.3	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				23017	23095	23173		
1.4	QPSK	1	0	23.20	23.01	22.93	24.00	0
		1	2	22.95	23.10	23.19	24.00	0
		1	5	23.17	23.17	23.04	24.00	0
		3	0	22.12	22.03	22.00	23.00	0-1
		3	2	22.08	22.08	21.97	23.00	0-1
		3	3	22.18	22.31	21.93	23.00	0-1
		6	0	22.23	22.14	22.08	23.00	0-1
	16-QAM	1	0	22.61	22.10	22.10	23.00	0-1
		1	2	22.37	22.44	22.51	23.00	0-1
		1	5	22.78	22.70	22.49	23.00	0-1
		3	0	21.09	21.12	20.96	22.00	0-2
		3	2	21.16	21.29	21.15	22.00	0-2
		3	3	21.19	21.29	21.04	22.00	0-2
		6	0	21.23	21.21	21.27	22.00	0-2
	64-QAM	1	0	21.62	20.96	21.00	22.00	0-2
		1	2	21.32	21.40	21.49	22.00	0-2
		1	5	21.74	21.55	21.45	22.00	0-2
		3	0	20.16	20.10	20.00	21.00	0-3
		3	2	20.07	20.14	20.18	21.00	0-3
		3	3	20.17	20.24	20.11	21.00	0-3
		6	0	20.18	20.07	20.30	21.00	0-3

LTE Band 13								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				782	782	782		
Channel				23230	23230	23230		
10	QPSK	1	0	23.35			24.00	0
		1	25	23.30			24.00	0
		1	49	23.19			24.00	0
		25	0	22.41			23.00	0-1
		25	12	22.30			23.00	0-1
		25	25	22.32			23.00	0-1
		50	0	22.30			23.00	0-1
	16-QAM	1	0	22.62			23.00	0-1
		1	25	22.44			23.00	0-1
		1	49	22.86			23.00	0-1
		25	0	21.15			22.00	0-2
		25	12	21.26			22.00	0-2
		25	25	21.30			22.00	0-2
		50	0	21.50			22.00	0-2
	64-QAM	1	0	21.55			22.00	0-2
		1	25	21.34			22.00	0-2
		1	49	21.85			22.00	0-2
		25	0	20.12			21.00	0-3
		25	12	20.25			21.00	0-3
		25	25	20.26			21.00	0-3
		50	0	20.47			21.00	0-3
Frequency (MHz)				779.5	782	784.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				23205	23230	23255		
5	QPSK	1	0	23.27	23.17	23.11	24.00	0
		1	12	23.32	23.29	23.11	24.00	0
		1	24	23.11	22.99	22.90	24.00	0
		12	0	22.35	22.29	22.28	23.00	0-1
		12	6	22.21	22.19	21.98	23.00	0-1
		12	13	22.29	22.09	22.01	23.00	0-1
		25	0	22.27	22.03	22.25	23.00	0-1
	16-QAM	1	0	22.56	22.30	22.54	23.00	0-1
		1	12	22.43	22.19	22.20	23.00	0-1
		1	24	22.78	22.66	22.58	23.00	0-1
		12	0	21.09	20.83	20.96	22.00	0-2
		12	6	21.17	20.95	21.07	22.00	0-2
		12	13	21.25	21.24	21.11	22.00	0-2
		25	0	21.49	21.30	21.46	22.00	0-2
	64-QAM	1	0	21.50	21.28	21.35	22.00	0-2
		1	12	21.28	21.09	21.27	22.00	0-2
		1	24	21.76	21.57	21.66	22.00	0-2
		12	0	20.06	19.99	19.95	21.00	0-3
		12	6	20.18	20.03	19.93	21.00	0-3
		12	13	20.23	20.07	20.19	21.00	0-3
		25	0	20.40	20.31	20.26	21.00	0-3

LTE Band 17								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				709	710	711		
Channel				23780	23790	23800		
10	QPSK	1	0	22.96	22.95	22.92	24.00	0
		1	25	23.18	23.09	23.13	24.00	0
		1	49	23.23	23.06	23.05	24.00	0
		25	0	22.10	22.04	21.94	23.00	0-1
		25	12	22.06	22.18	22.08	23.00	0-1
		25	25	22.25	22.32	21.97	23.00	0-1
		50	0	22.19	22.18	22.03	23.00	0-1
	16-QAM	1	0	22.16	22.53	22.43	23.00	0-1
		1	25	22.38	22.50	22.46	23.00	0-1
		1	49	22.56	22.49	22.46	23.00	0-1
		25	0	21.20	21.15	21.17	22.00	0-2
		25	12	21.35	21.03	21.18	22.00	0-2
		25	25	21.24	21.16	21.10	22.00	0-2
		50	0	21.34	21.24	21.26	22.00	0-2
	64-QAM	1	0	21.14	21.47	21.33	22.00	0-2
		1	25	21.35	21.43	21.41	22.00	0-2
		1	49	21.48	21.43	21.39	22.00	0-2
		25	0	20.18	20.15	20.12	21.00	0-3
		25	12	20.28	19.98	20.09	21.00	0-3
		25	25	20.24	20.08	20.06	21.00	0-3
		50	0	20.29	20.22	20.18	21.00	0-3
Frequency (MHz)				706.5	710	713.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				23755	23790	23825		
5	QPSK	1	0	22.81	22.95	22.80	24.00	0
		1	12	23.12	23.04	23.01	24.00	0
		1	24	23.10	22.97	22.93	24.00	0
		12	0	22.08	21.99	21.93	23.00	0-1
		12	6	21.96	22.14	22.00	23.00	0-1
		12	13	22.17	22.20	21.94	23.00	0-1
		25	0	22.09	22.18	21.92	23.00	0-1
	16-QAM	1	0	22.05	22.44	22.38	23.00	0-1
		1	12	22.27	22.45	22.38	23.00	0-1
		1	24	22.46	22.34	22.39	23.00	0-1
		12	0	21.11	21.03	21.06	22.00	0-2
		12	6	21.31	20.90	21.09	22.00	0-2
		12	13	21.19	21.07	20.95	22.00	0-2
		25	0	21.28	21.24	21.12	22.00	0-2
	64-QAM	1	0	21.00	21.36	21.23	22.00	0-2
		1	12	21.24	21.33	21.40	22.00	0-2
		1	24	21.39	21.43	21.35	22.00	0-2
		12	0	20.12	20.02	19.98	21.00	0-3
		12	6	20.13	19.85	19.97	21.00	0-3
		12	13	20.18	19.94	19.97	21.00	0-3
		25	0	20.23	20.04	19.92	21.00	0-3

LTE Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				821.5	831.5	841.5		
Channel				26765	26865	26965		
15	QPSK	1	0	22.92	22.87	23.01	24.00	0
		1	36	23.05	23.28	22.93	24.00	0
		1	74	23.19	22.96	22.92	24.00	0
		36	0	22.08	22.11	22.05	23.00	0-1
		36	18	22.10	22.30	21.92	23.00	0-1
		36	37	22.20	22.19	22.18	23.00	0-1
		75	0	22.16	22.49	22.12	23.00	0-1
	16-QAM	1	0	22.36	22.48	22.63	23.00	0-1
		1	36	22.60	22.60	22.32	23.00	0-1
		1	74	22.47	22.29	22.38	23.00	0-1
		36	0	21.25	21.18	21.17	22.00	0-2
		36	18	21.33	21.37	21.02	22.00	0-2
		36	37	21.22	21.34	21.11	22.00	0-2
		75	0	21.37	21.65	21.39	22.00	0-2
	64-QAM	1	0	21.32	21.36	21.52	22.00	0-2
		1	36	21.59	21.55	21.29	22.00	0-2
		1	74	21.44	21.27	21.38	22.00	0-2
		36	0	20.12	20.10	20.06	21.00	0-3
		36	18	20.31	20.33	19.94	21.00	0-3
		36	37	20.07	20.31	19.97	21.00	0-3
		75	0	20.22	20.65	20.26	21.00	0-3
Frequency (MHz)				819	831.5	844	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				26740	26865	26990		
10	QPSK	1	0	22.87	22.74	22.92	24.00	0
		1	25	22.98	23.18	22.89	24.00	0
		1	49	23.25	22.95	22.90	24.00	0
		25	0	22.04	22.06	21.94	23.00	0-1
		25	12	22.04	22.20	21.87	23.00	0-1
		25	25	22.06	22.08	22.17	23.00	0-1
		50	0	22.09	22.37	21.98	23.00	0-1
	16-QAM	1	0	22.25	22.39	22.57	23.00	0-1
		1	25	22.46	22.50	22.19	23.00	0-1
		1	49	22.42	22.15	22.37	23.00	0-1
		25	0	21.23	21.17	21.03	22.00	0-2
		25	12	21.29	21.32	20.95	22.00	0-2
		25	25	21.17	21.27	21.08	22.00	0-2
		50	0	21.29	21.57	21.26	22.00	0-2
	64-QAM	1	0	21.18	21.22	21.51	22.00	0-2
		1	25	21.56	21.51	21.15	22.00	0-2
		1	49	21.38	21.25	21.30	22.00	0-2
		25	0	19.99	19.99	19.93	21.00	0-3
		25	12	20.31	20.25	19.82	21.00	0-3
		25	25	19.95	20.25	19.93	21.00	0-3
		50	0	20.18	20.57	20.20	21.00	0-3

LTE Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				816.5	831.5	846.5		
Channel				26715	26865	27015		
5	QPSK	1	0	22.92	22.82	22.90	24.00	0
		1	12	22.96	23.16	22.91	24.00	0
		1	24	23.10	22.93	22.79	24.00	0
		12	0	22.00	21.99	22.02	23.00	0-1
		12	6	22.01	22.26	21.86	23.00	0-1
		12	13	22.09	22.14	22.06	23.00	0-1
		25	0	22.06	22.48	22.07	23.00	0-1
	16-QAM	1	0	22.28	22.35	22.54	23.00	0-1
		1	12	22.60	22.47	22.20	23.00	0-1
		1	24	22.41	22.16	22.37	23.00	0-1
		12	0	21.12	21.05	21.16	22.00	0-2
		12	6	21.26	21.35	21.02	22.00	0-2
		12	13	21.15	21.28	20.98	22.00	0-2
		25	0	21.28	21.53	21.29	22.00	0-2
	64-QAM	1	0	21.30	21.27	21.40	22.00	0-2
		1	12	21.46	21.44	21.26	22.00	0-2
		1	24	21.39	21.22	21.35	22.00	0-2
		12	0	20.09	20.01	19.98	21.00	0-3
		12	6	20.19	20.19	19.82	21.00	0-3
		12	13	19.97	20.26	19.88	21.00	0-3
		25	0	20.17	20.64	20.14	21.00	0-3
Frequency (MHz)				815.5	831.5	847.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				26705	26865	27025		
3	QPSK	1	0	22.80	22.81	22.78	24.00	0
		1	7	22.94	22.82	23.11	24.00	0
		1	14	23.08	22.91	22.70	24.00	0
		8	0	21.90	21.98	21.96	23.00	0-1
		8	4	21.89	22.13	21.76	23.00	0-1
		8	7	22.06	21.99	21.97	23.00	0-1
		15	0	21.94	22.42	22.07	23.00	0-1
	16-QAM	1	0	22.15	22.34	22.45	23.00	0-1
		1	7	22.49	22.33	22.14	23.00	0-1
		1	14	22.27	22.14	22.30	23.00	0-1
		8	0	21.02	20.91	21.02	22.00	0-2
		8	4	21.14	21.24	20.93	22.00	0-2
		8	7	21.04	21.15	20.96	22.00	0-2
		15	0	21.22	21.49	21.20	22.00	0-2
	64-QAM	1	0	21.27	21.22	21.36	22.00	0-2
		1	7	21.43	21.40	21.22	22.00	0-2
		1	14	21.39	21.19	21.33	22.00	0-2
		8	0	19.95	19.94	19.88	21.00	0-3
		8	4	20.08	20.15	19.69	21.00	0-3
		8	7	19.86	20.23	19.81	21.00	0-3
		15	0	20.07	20.54	20.09	21.00	0-3

LTE Band 26								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				814.7	831.5	848.3		
Channel				26697	26865	27033		
1.4	QPSK	1	0	22.66	22.73	22.74	24.00	0
		1	2	22.89	22.72	23.03	24.00	0
		1	5	23.05	22.82	22.57	24.00	0
		3	0	21.81	21.91	21.89	23.00	0-1
		3	2	21.85	22.01	21.73	23.00	0-1
		3	3	21.99	21.98	21.92	23.00	0-1
		6	0	21.91	22.40	21.98	23.00	0-1
	16-QAM	1	0	22.15	22.30	22.33	23.00	0-1
		1	2	22.49	22.30	22.12	23.00	0-1
		1	5	22.20	22.05	22.26	23.00	0-1
		3	0	20.89	20.81	20.92	22.00	0-2
		3	2	21.05	21.16	20.86	22.00	0-2
		3	3	20.95	21.01	20.93	22.00	0-2
		6	0	21.08	21.40	21.07	22.00	0-2
	64-QAM	1	0	21.15	21.07	21.30	22.00	0-2
		1	2	21.38	21.34	21.18	22.00	0-2
		1	5	21.38	21.06	21.23	22.00	0-2
		3	0	19.87	19.88	19.83	21.00	0-3
		3	2	20.04	20.10	19.57	21.00	0-3
		3	3	19.77	20.23	19.75	21.00	0-3
		6	0	20.01	20.47	20.08	21.00	0-3

LTE Band 30								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2310	2310	2310		
Channel				27710	27710	27710		
10	QPSK	1	0	23.11			24.00	0
		1	25	22.96			24.00	0
		1	49	23.05			24.00	0
		25	0	22.19			23.00	0-1
		25	12	22.11			23.00	0-1
		25	25	22.01			23.00	0-1
		50	0	22.08			23.00	0-1
	16-QAM	1	0	22.26			23.00	0-1
		1	25	22.37			23.00	0-1
		1	49	22.48			23.00	0-1
		25	0	21.28			22.00	0-2
		25	12	21.26			22.00	0-2
		25	25	21.24			22.00	0-2
		50	0	21.27			22.00	0-2
	64-QAM	1	0	21.20			22.00	0-2
		1	25	21.25			22.00	0-2
		1	49	21.36			22.00	0-2
		25	0	20.22			21.00	0-3
		25	12	20.20			21.00	0-3
		25	25	20.12			21.00	0-3
		50	0	20.25			21.00	0-3
Frequency (MHz)				2307.5	2310	2312.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				27685	27710	27735		
5	QPSK	1	0	23.00	22.87	22.71	24.00	0
		1	12	22.82	22.77	22.71	24.00	0
		1	24	23.04	22.94	22.90	24.00	0
		12	0	22.05	21.77	21.77	23.00	0-1
		12	6	22.08	21.83	22.00	23.00	0-1
		12	13	21.99	21.95	21.90	23.00	0-1
		25	0	21.99	21.96	21.89	23.00	0-1
	16-QAM	1	0	22.12	21.92	21.84	23.00	0-1
		1	12	22.26	22.19	21.96	23.00	0-1
		1	24	22.34	22.22	22.05	23.00	0-1
		12	0	21.27	21.10	21.07	22.00	0-2
		12	6	21.23	21.23	21.21	22.00	0-2
		12	13	21.11	21.08	21.01	22.00	0-2
		25	0	21.19	20.99	21.14	22.00	0-2
	64-QAM	1	0	21.05	20.91	21.03	22.00	0-2
		1	12	21.13	20.94	21.04	22.00	0-2
		1	24	21.32	21.16	21.31	22.00	0-2
		12	0	20.07	19.99	19.90	21.00	0-3
		12	6	20.19	19.94	19.97	21.00	0-3
		12	13	19.98	19.69	19.78	21.00	0-3
		25	0	20.23	20.18	20.06	21.00	0-3

LTE Band 66								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1720	1745	1770		
Channel				132072	132322	132572		
20	QPSK	1	0	23.30	23.24	23.85	24.00	0
		1	50	23.36	23.20	23.39	24.00	0
		1	99	23.07	23.74	23.77	24.00	0
		50	0	22.44	22.36	22.51	23.00	0-1
		50	25	22.40	22.54	22.36	23.00	0-1
		50	50	22.29	22.84	22.43	23.00	0-1
		100	0	22.50	22.76	22.68	23.00	0-1
	16-QAM	1	0	22.48	22.40	22.92	23.00	0-1
		1	50	22.34	22.62	22.49	23.00	0-1
		1	99	22.14	22.45	22.89	23.00	0-1
		50	0	21.26	21.29	21.48	22.00	0-2
		50	25	21.34	21.45	21.34	22.00	0-2
		50	50	21.19	21.71	21.40	22.00	0-2
		100	0	21.47	21.69	21.64	22.00	0-2
	64-QAM	1	0	21.39	21.29	21.78	22.00	0-2
		1	50	21.21	21.50	21.41	22.00	0-2
		1	99	21.06	21.41	21.87	22.00	0-2
		50	0	20.25	20.21	20.43	21.00	0-3
		50	25	20.27	20.34	20.19	21.00	0-3
		50	50	20.12	20.68	20.31	21.00	0-3
		100	0	20.38	20.64	20.58	21.00	0-3
Frequency (MHz)				1717.5	1745	1772.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				132047	132322	132597		
15	QPSK	1	0	23.20	23.18	23.78	24.00	0
		1	36	23.31	23.06	23.32	24.00	0
		1	74	23.01	23.63	23.71	24.00	0
		36	0	22.31	22.25	22.47	23.00	0-1
		36	18	22.25	22.45	22.25	23.00	0-1
		36	37	22.27	22.76	22.33	23.00	0-1
		75	0	22.48	22.73	22.65	23.00	0-1
	16-QAM	1	0	22.34	22.26	22.86	23.00	0-1
		1	36	22.25	22.49	22.46	23.00	0-1
		1	74	22.07	22.30	22.79	23.00	0-1
		36	0	21.13	21.15	21.43	22.00	0-2
		36	18	21.23	21.45	21.21	22.00	0-2
		36	37	21.11	21.69	21.39	22.00	0-2
		75	0	21.46	21.55	21.58	22.00	0-2
	64-QAM	1	0	21.36	21.24	21.70	22.00	0-2
		1	36	21.16	21.39	21.35	22.00	0-2
		1	74	20.94	21.36	21.79	22.00	0-2
		36	0	20.25	20.08	20.42	21.00	0-3
		36	18	20.22	20.31	20.10	21.00	0-3
		36	37	20.00	20.64	20.24	21.00	0-3
		75	0	20.34	20.57	20.54	21.00	0-3

LTE Band 66								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1715	1745	1775		
Channel				132022	132322	132622		
10	QPSK	1	0	23.22	23.17	23.73	24.00	0
		1	25	23.28	23.10	23.38	24.00	0
		1	49	22.97	23.74	23.71	24.00	0
		25	0	22.36	22.24	22.43	23.00	0-1
		25	12	22.27	22.48	22.25	23.00	0-1
		25	25	22.20	22.73	22.42	23.00	0-1
		50	0	22.38	22.76	22.56	23.00	0-1
	16-QAM	1	0	22.44	22.35	22.78	23.00	0-1
		1	25	22.23	22.57	22.35	23.00	0-1
		1	49	22.11	22.41	22.83	23.00	0-1
		25	0	21.16	21.22	21.45	22.00	0-2
		25	12	21.24	21.37	21.28	22.00	0-2
		25	25	21.09	21.62	21.26	22.00	0-2
		50	0	21.43	21.68	21.50	22.00	0-2
	64-QAM	1	0	21.38	21.17	21.65	22.00	0-2
		1	25	21.08	21.48	21.33	22.00	0-2
		1	49	20.98	21.38	21.76	22.00	0-2
		25	0	20.18	20.12	20.42	21.00	0-3
		25	12	20.24	20.33	20.19	21.00	0-3
		25	25	20.03	20.58	20.31	21.00	0-3
		50	0	20.32	20.61	20.51	21.00	0-3
Frequency (MHz)				1712.5	1745	1777.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				131997	132322	132647		
5	QPSK	1	0	23.15	23.11	23.68	24.00	0
		1	12	23.19	23.07	23.31	24.00	0
		1	24	22.85	23.71	23.67	24.00	0
		12	0	22.27	22.18	22.43	23.00	0-1
		12	6	22.20	22.37	22.11	23.00	0-1
		12	13	22.08	22.71	22.29	23.00	0-1
		25	0	22.32	22.73	22.51	23.00	0-1
	16-QAM	1	0	22.41	22.31	22.67	23.00	0-1
		1	12	22.14	22.48	22.25	23.00	0-1
		1	24	22.09	22.37	22.74	23.00	0-1
		12	0	21.08	21.09	21.32	22.00	0-2
		12	6	21.23	21.31	21.15	22.00	0-2
		12	13	21.09	21.58	21.16	22.00	0-2
		25	0	21.31	21.62	21.42	22.00	0-2
	64-QAM	1	0	21.31	21.09	21.58	22.00	0-2
		1	12	20.95	21.36	21.24	22.00	0-2
		1	24	20.94	21.29	21.71	22.00	0-2
		12	0	20.03	19.99	20.39	21.00	0-3
		12	6	20.23	20.32	20.08	21.00	0-3
		12	13	19.89	20.47	20.30	21.00	0-3
		25	0	20.28	20.48	20.41	21.00	0-3

LTE Band 66								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				1711.5	1745	1778.5		
Channel				131987	132322	132657		
3	QPSK	1	0	23.12	23.15	23.66	24.00	0
		1	7	23.19	22.99	23.24	24.00	0
		1	14	22.86	23.66	23.70	24.00	0
		8	0	22.33	22.24	22.36	23.00	0-1
		8	4	22.26	22.40	22.17	23.00	0-1
		8	7	22.12	22.67	22.36	23.00	0-1
		15	0	22.24	22.63	22.50	23.00	0-1
	16-QAM	1	0	22.40	22.23	22.68	23.00	0-1
		1	7	22.21	22.52	22.32	23.00	0-1
		1	14	22.02	22.41	22.81	23.00	0-1
		8	0	21.15	21.20	21.43	22.00	0-2
		8	4	21.16	21.29	21.17	22.00	0-2
		8	7	21.03	21.51	21.23	22.00	0-2
		15	0	21.34	21.55	21.42	22.00	0-2
	64-QAM	1	0	21.29	21.11	21.52	22.00	0-2
		1	7	20.97	21.42	21.24	22.00	0-2
		1	14	20.88	21.24	21.74	22.00	0-2
		8	0	20.09	20.07	20.30	21.00	0-3
		8	4	20.18	20.24	20.10	21.00	0-3
		8	7	19.92	20.56	20.23	21.00	0-3
		15	0	20.20	20.59	20.38	21.00	0-3
Frequency (MHz)				1710.7	1745	1779.3	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				131979	132322	132665		
1.4	QPSK	1	0	22.99	23.12	23.54	24.00	0
		1	2	23.17	22.85	23.17	24.00	0
		1	5	22.80	23.60	23.56	24.00	0
		3	0	22.22	22.24	22.22	23.00	0-1
		3	2	22.21	22.36	22.09	23.00	0-1
		3	3	22.11	22.66	22.25	23.00	0-1
		6	0	22.13	22.56	22.47	23.00	0-1
	16-QAM	1	0	22.34	22.12	22.56	23.00	0-1
		1	2	22.20	22.50	22.17	23.00	0-1
		1	5	21.87	22.32	22.78	23.00	0-1
		3	0	21.15	21.10	21.38	22.00	0-2
		3	2	21.11	21.27	21.14	22.00	0-2
		3	3	21.03	21.39	21.13	22.00	0-2
		6	0	21.31	21.49	21.28	22.00	0-2
	64-QAM	1	0	21.28	21.09	21.48	22.00	0-2
		1	2	20.91	21.31	21.18	22.00	0-2
		1	5	20.83	21.20	21.62	22.00	0-2
		3	0	19.97	19.95	20.22	21.00	0-3
		3	2	20.10	20.15	20.03	21.00	0-3
		3	3	19.90	20.48	20.13	21.00	0-3
		6	0	20.19	20.58	20.34	21.00	0-3

LTE TDD Band 38 / Band 41 power table:

LTE Band 38								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2580	2595	2610		
Channel				37850	38000	38150		
20	QPSK	1	0	22.63	22.75	22.80	24.00	0
		1	50	22.57	22.72	22.76	24.00	0
		1	99	22.60	22.79	22.81	24.00	0
		50	0	21.54	21.60	21.65	23.00	0-1
		50	25	21.51	21.59	21.64	23.00	0-1
		50	50	21.51	21.59	21.67	23.00	0-1
		100	0	21.51	21.61	21.66	23.00	0-1
	16-QAM	1	0	21.50	21.54	21.61	23.00	0-1
		1	50	21.41	21.51	21.63	23.00	0-1
		1	99	21.46	21.56	21.66	23.00	0-1
		50	0	20.66	20.69	20.82	22.00	0-2
		50	25	20.66	20.68	20.81	22.00	0-2
		50	50	20.64	20.74	20.82	22.00	0-2
		100	0	20.61	20.68	20.75	22.00	0-2
	64-QAM	1	0	20.49	20.53	20.58	22.00	0-2
		1	50	20.36	20.45	20.50	22.00	0-2
		1	99	20.37	20.55	20.62	22.00	0-2
		50	0	19.63	19.65	19.75	21.00	0-3
		50	25	19.58	19.62	19.79	21.00	0-3
		50	50	19.50	19.62	19.72	21.00	0-3
		100	0	19.59	19.62	19.69	21.00	0-3
Frequency (MHz)				2577.5	2595	2612.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				37825	38000	38175		
15	QPSK	1	0	22.59	22.68	22.65	24.00	0
		1	36	22.45	22.61	22.74	24.00	0
		1	74	22.55	22.79	22.76	24.00	0
		36	0	21.43	21.60	21.57	23.00	0-1
		36	18	21.46	21.54	21.61	23.00	0-1
		36	37	21.41	21.48	21.58	23.00	0-1
		75	0	21.48	21.48	21.53	23.00	0-1
	16-QAM	1	0	21.48	21.41	21.53	23.00	0-1
		1	36	21.40	21.43	21.59	23.00	0-1
		1	74	21.38	21.52	21.61	23.00	0-1
		36	0	20.57	20.62	20.78	22.00	0-2
		36	18	20.57	20.58	20.72	22.00	0-2
		36	37	20.54	20.59	20.75	22.00	0-2
		75	0	20.58	20.58	20.63	22.00	0-2
	64-QAM	1	0	20.35	20.53	20.52	22.00	0-2
		1	36	20.24	20.34	20.43	22.00	0-2
		1	74	20.34	20.52	20.58	22.00	0-2
		36	0	19.54	19.58	19.65	21.00	0-3
		36	18	19.46	19.59	19.70	21.00	0-3
		36	37	19.39	19.51	19.62	21.00	0-3
		75	0	19.49	19.52	19.62	21.00	0-3

LTE Band 38								
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)			Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2575	2595	2615		
Channel				37800	38000	38200		
10	QPSK	1	0	22.59	22.66	22.75	24.00	0
		1	25	22.43	22.69	22.64	24.00	0
		1	49	22.53	22.77	22.76	24.00	0
		25	0	21.48	21.55	21.50	23.00	0-1
		25	12	21.51	21.55	21.59	23.00	0-1
		25	25	21.47	21.50	21.61	23.00	0-1
		50	0	21.51	21.48	21.63	23.00	0-1
	16-QAM	1	0	21.50	21.52	21.56	23.00	0-1
		1	25	21.41	21.47	21.60	23.00	0-1
		1	49	21.33	21.43	21.53	23.00	0-1
		25	0	20.63	20.64	20.75	22.00	0-2
		25	12	20.59	20.66	20.68	22.00	0-2
		25	25	20.50	20.71	20.69	22.00	0-2
		50	0	20.56	20.68	20.75	22.00	0-2
	64-QAM	1	0	20.39	20.53	20.46	22.00	0-2
		1	25	20.31	20.44	20.47	22.00	0-2
		1	49	20.33	20.55	20.60	22.00	0-2
		25	0	19.49	19.55	19.62	21.00	0-3
		25	12	19.50	19.57	19.68	21.00	0-3
		25	25	19.44	19.56	19.66	21.00	0-3
		50	0	19.48	19.48	19.66	21.00	0-3
Frequency (MHz)				2572.5	2595	2617.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				37775	38000	38225		
5	QPSK	1	0	22.49	22.57	22.73	24.00	0
		1	12	22.30	22.60	22.51	24.00	0
		1	24	22.40	22.72	22.61	24.00	0
		12	0	21.35	21.49	21.40	23.00	0-1
		12	6	21.47	21.48	21.58	23.00	0-1
		12	13	21.40	21.36	21.52	23.00	0-1
		25	0	21.45	21.47	21.50	23.00	0-1
	16-QAM	1	0	21.49	21.47	21.49	23.00	0-1
		1	12	21.28	21.46	21.54	23.00	0-1
		1	24	21.31	21.31	21.46	23.00	0-1
		12	0	20.54	20.50	20.68	22.00	0-2
		12	6	20.58	20.59	20.64	22.00	0-2
		12	13	20.48	20.60	20.59	22.00	0-2
		25	0	20.53	20.64	20.69	22.00	0-2
	64-QAM	1	0	20.29	20.40	20.46	22.00	0-2
		1	12	20.22	20.34	20.44	22.00	0-2
		1	24	20.19	20.46	20.48	22.00	0-2
		12	0	19.40	19.41	19.54	21.00	0-3
		12	6	19.47	19.55	19.59	21.00	0-3
		12	13	19.34	19.46	19.56	21.00	0-3
		25	0	19.42	19.40	19.53	21.00	0-3

LTE Band 41										
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)					Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
Channel				39750	40185	40620	41055	41490		
20	QPSK	1	0	22.81	22.94	22.91	23.03	22.90	24.00	0
		1	50	22.79	22.85	22.87	22.95	22.82	24.00	0
		1	99	22.77	22.88	22.93	22.95	22.84	24.00	0
		50	0	21.66	21.72	21.77	21.83	21.65	23.00	0-1
		50	25	21.64	21.72	21.76	21.78	21.63	23.00	0-1
		50	50	21.64	21.72	21.78	21.80	21.66	23.00	0-1
		100	0	21.74	21.75	21.77	21.80	21.75	23.00	0-1
	16-QAM	1	0	21.60	21.76	21.72	21.83	21.72	23.00	0-1
		1	50	21.58	21.70	21.67	21.78	21.65	23.00	0-1
		1	99	21.59	21.70	21.74	21.77	21.66	23.00	0-1
		50	0	20.77	20.87	20.85	20.92	20.76	22.00	0-2
		50	25	20.78	20.84	20.83	20.89	20.74	22.00	0-2
		50	50	20.84	20.82	20.88	20.86	20.76	22.00	0-2
		100	0	20.86	20.80	20.81	20.85	20.77	22.00	0-2
	64-QAM	1	0	20.52	20.75	20.58	20.70	20.66	22.00	0-2
		1	50	20.57	20.64	20.58	20.77	20.61	22.00	0-2
		1	99	20.48	20.61	20.71	20.68	20.53	22.00	0-2
		50	0	19.63	19.77	19.73	19.89	19.67	21.00	0-3
		50	25	19.69	19.71	19.73	19.78	19.71	21.00	0-3
		50	50	19.74	19.69	19.82	19.73	19.71	21.00	0-3
		100	0	19.74	19.68	19.80	19.79	19.72	21.00	0-3
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				39725	40173	40620	41068	41515		
15	QPSK	1	0	22.77	22.93	22.81	23.00	22.77	24.00	0
		1	36	22.70	22.77	22.76	22.92	22.70	24.00	0
		1	74	22.76	22.80	22.90	22.86	22.76	24.00	0
		36	0	21.61	21.61	21.76	21.74	21.52	23.00	0-1
		36	18	21.51	21.68	21.64	21.64	21.49	23.00	0-1
		36	37	21.53	21.59	21.76	21.79	21.59	23.00	0-1
		75	0	21.62	21.69	21.68	21.68	21.69	23.00	0-1
	16-QAM	1	0	21.59	21.65	21.58	21.79	21.61	23.00	0-1
		1	36	21.52	21.59	21.59	21.69	21.59	23.00	0-1
		1	74	21.57	21.62	21.60	21.69	21.65	23.00	0-1
		36	0	20.65	20.79	20.76	20.81	20.73	22.00	0-2
		36	18	20.64	20.84	20.77	20.77	20.69	22.00	0-2
		36	37	20.71	20.68	20.83	20.81	20.72	22.00	0-2
		75	0	20.74	20.78	20.71	20.74	20.64	22.00	0-2
	64-QAM	1	0	20.41	20.72	20.45	20.60	20.64	22.00	0-2
		1	36	20.43	20.58	20.48	20.71	20.60	22.00	0-2
		1	74	20.45	20.56	20.67	20.61	20.49	22.00	0-2
		36	0	19.62	19.72	19.62	19.80	19.54	21.00	0-3
		36	18	19.60	19.59	19.70	19.70	19.66	21.00	0-3
		36	37	19.68	19.66	19.81	19.68	19.66	21.00	0-3
		75	0	19.74	19.53	19.66	19.69	19.59	21.00	0-3

LTE Band 41										
BW(Mhz)	Modulation	RB Size	RB Offset	Conducted power (dBm)					Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
Channel				39700	40160	40620	41080	41540		
10	QPSK	1	0	22.78	22.80	22.89	22.89	22.80	24.00	0
		1	25	22.76	22.74	22.87	22.86	22.71	24.00	0
		1	49	22.64	22.83	22.84	22.94	22.78	24.00	0
		25	0	21.59	21.69	21.63	21.80	21.51	23.00	0-1
		25	12	21.53	21.62	21.70	21.74	21.50	23.00	0-1
		25	25	21.58	21.71	21.64	21.71	21.58	23.00	0-1
		50	0	21.64	21.72	21.75	21.77	21.60	23.00	0-1
	16-QAM	1	0	21.52	21.68	21.71	21.82	21.68	23.00	0-1
		1	25	21.45	21.57	21.55	21.77	21.58	23.00	0-1
		1	49	21.55	21.70	21.66	21.75	21.61	23.00	0-1
		25	0	20.63	20.79	20.80	20.83	20.69	22.00	0-2
		25	12	20.72	20.72	20.79	20.75	20.72	22.00	0-2
		25	25	20.73	20.71	20.83	20.74	20.72	22.00	0-2
		50	0	20.85	20.69	20.79	20.70	20.65	22.00	0-2
	64-QAM	1	0	20.48	20.68	20.51	20.65	20.61	22.00	0-2
		1	25	20.54	20.61	20.55	20.67	20.57	22.00	0-2
		1	49	20.48	20.57	20.63	20.55	20.43	22.00	0-2
		25	0	19.57	19.69	19.64	19.79	19.56	21.00	0-3
		25	12	19.64	19.67	19.60	19.74	19.69	21.00	0-3
		25	25	19.68	19.67	19.74	19.69	19.66	21.00	0-3
		50	0	19.67	19.68	19.66	19.68	19.67	21.00	0-3
Frequency (MHz)				2498.5	2547.8	2593	2640.3	2687.5	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
Channel				39675	40148	40620	41093	41565		
5	QPSK	1	0	22.75	22.69	22.83	22.80	22.73	24.00	0
		1	12	22.62	22.70	22.74	22.75	22.69	24.00	0
		1	24	22.56	22.71	22.78	22.87	22.67	24.00	0
		12	0	21.50	21.55	21.51	21.68	21.39	23.00	0-1
		12	6	21.44	21.61	21.70	21.71	21.43	23.00	0-1
		12	13	21.51	21.58	21.57	21.58	21.50	23.00	0-1
		25	0	21.54	21.64	21.71	21.69	21.60	23.00	0-1
	16-QAM	1	0	21.42	21.61	21.66	21.71	21.57	23.00	0-1
		1	12	21.37	21.48	21.45	21.73	21.50	23.00	0-1
		1	24	21.46	21.69	21.64	21.73	21.56	23.00	0-1
		12	0	20.60	20.67	20.80	20.73	20.65	22.00	0-2
		12	6	20.60	20.60	20.67	20.65	20.64	22.00	0-2
		12	13	20.68	20.57	20.76	20.60	20.62	22.00	0-2
		25	0	20.85	20.59	20.78	20.56	20.54	22.00	0-2
	64-QAM	1	0	20.46	20.62	20.45	20.50	20.54	22.00	0-2
		1	12	20.51	20.61	20.50	20.57	20.53	22.00	0-2
		1	24	20.48	20.48	20.62	20.41	20.43	22.00	0-2
		12	0	19.48	19.63	19.62	19.69	19.46	21.00	0-3
		12	6	19.59	19.59	19.47	19.65	19.67	21.00	0-3
		12	13	19.60	19.56	19.66	19.67	19.57	21.00	0-3
		25	0	19.59	19.67	19.56	19.57	19.55	21.00	0-3

1.3.1 LTE Downlink CA specification

LTE Downlink 2CA conducted power table

Two Component Carrier Maximum Conducted Power															
PCC									SCC				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)	Configurations
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B17	20	2175	2132.5	23.44	23.47	CA_2A-17A
LTE B17	10	23780	709	QPSK	1	49	5780	739	LTE B2	10	900	1960	23.21	23.23	CA_2A-17A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B17	20	2175	2132.5	23.68	23.84	CA_4A-17A
LTE B17	10	23780	709	QPSK	1	49	5780	739	LTE B4	10	2175	2132.5	23.18	23.23	CA_4A-17A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B7	10	3100	2655	23.39	23.51	CA_5A-7A
LTE B7	20	20850	2510	QPSK	1	99	2850	2630	LTE B5	20	2525	881.5	22.97	23.10	CA_5A-7A
LTE B7	15	20825	2507.5	QPSK	75	0	2825	2627.5	LTE B7	5	2918	2636.8	21.91	21.99	CA_7B
LTE B7	20	20850	2510	QPSK	50	0	2850	2630	LTE B7	20	3048	2649.8	21.98	21.99	CA_7C
LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B7	20	3152	2660.2	22.62	22.82	CA_7C
LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B7	20	2850	2630	22.74	22.82	CA_7A-7A
LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	41490	2680	22.71	22.81	CA_41A-41A
LTE B41	20	41490	2680	QPSK	100	0	41490	2680	LTE B41	20	39750	2506	21.64	21.75	CA_41A-41A

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
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	900	1960	LTE B5	10	2525	881.5	23.26	23.47	CA_2A-2A-5A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	900	1960	LTE B5	10	2525	881.5	23.20	23.47	CA_2A-2A-5A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B2	20	900	1960	23.38	23.51	CA_2A-2A-5A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	900	1960	LTE B13	10	5230	751	23.24	23.47	CA_2A-2A-13A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	900	1960	LTE B13	10	5230	751	23.22	23.47	CA_2A-2A-13A
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B2	10	900	1960	23.20	23.35	CA_2A-2A-13A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	23.31	23.47	CA_2A-4A-5A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B2	20	900	1960	LTE B5	10	2525	881.5	23.70	23.84	CA_2A-4A-5A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.34	23.51	CA_2A-4A-5A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	23.24	23.47	CA_2A-4A-13A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B2	20	900	1960	LTE B5	10	2525	881.5	23.65	23.84	CA_2A-4A-13A
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.20	23.35	CA_2A-4A-13A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	23.22	23.47	CA_2A-5A-30A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	23.27	23.51	CA_2A-5A-30A
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	22.83	23.11	CA_2A-5A-30A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B5	10	2525	881.5	LTE B66	20	66886	2155	23.33	23.47	CA_2A-5A-66A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B66	20	66886	2155	23.28	23.51	CA_2A-5A-66A
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B2	20	900	1960	LTE B5	10	2525	881.5	23.62	23.85	CA_2A-5A-66A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	23.36	23.47	CA_2A-12A-30A
LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	23.17	23.31	CA_2A-12A-30A
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B12	10	5095	737.5	LTE B2	20	900	1960	22.82	23.11	CA_2A-12A-30A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B13	10	5230	751	LTE B66	20	66886	2155	23.33	23.47	CA_2A-13A-66A
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B66	20	66886	2155	23.17	23.35	CA_2A-13A-66A
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B2	20	900	1960	LTE B13	10	5230	751	23.74	23.85	CA_2A-13A-66A
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B66	20	66886	2155	LTE B66	20	66886	2155	23.25	23.47	CA_2A-66B
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B66	20	66886	2155	LTE B2	20	900	1960	23.70	23.85	CA_2A-66B
LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B66	20	66886	2155	LTE B66	20	66886	2155	23.29	23.47	CA_2A-66C
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B66	20	66886	2155	LTE B2	20	900	1960	23.58	23.85	CA_2A-66C
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	23.62	23.84	CA_4A-4A-5A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	23.63	23.84	CA_4A-4A-5A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B4	20	2175	2132.5	LTE B4	20	2175	2132.5	23.28	23.51	CA_4A-4A-5A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B4	20	2175	2132.5	LTE B13	10	5230	751	23.58	23.84	CA_4A-4A-13A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B4	20	2175	2132.5	LTE B13	10	5230	751	23.64	23.84	CA_4A-4A-13A
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B4	20	2175	2132.5	LTE B4	20	2175	2132.5	23.15	23.35	CA_4A-4A-13A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	23.55	23.84	CA_4A-5A-30A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	23.37	23.51	CA_4A-5A-30A
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	22.97	23.11	CA_4A-5A-30A
LTE B4	20	20300	1745	QPSK	1	99	2300	2145	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	23.68	23.84	CA_4A-12A-30A
LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	23.21	23.31	CA_4A-12A-30A
LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	22.93	23.11	CA_4A-12A-30A
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B66	20	66886	2155	LTE B66	20	66886	2155	23.29	23.51	CA_5A-66B
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B66	20	66886	2155	LTE B5	10	2525	881.5	23.66	23.85	CA_5A-66B
LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B66	20	66886	2155	LTE B66	20	66886	2155	23.38	23.51	CA_5A-66C
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B66	20	66886	2155	LTE B5	10	2525	881.5	23.57	23.85	CA_5A-66C
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B66	20	66886	2155	LTE B66	20	66886	2155	23.07	23.35	CA_13A-66B
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B66	20	66886	2155	LTE B13	10	5230	751	23.56	23.85	CA_13A-66B
LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B66	20	66886	2155	LTE B66	20	66886	2155	23.12	23.35	CA_13A-66C
LTE B66	20	132572	1770	QPSK	1	0	67036	2170	LTE B66	20	66886	2155	LTE B13	10	5230	751	23.66	23.85	CA_13A-66C
LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	40620	2593	LTE B41	20	41490	2680	22.57	22.81	CA_41D
LTE B41	20	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	39750	2506	LTE B41	20	41490	2680	22.64	22.91	CA_41D
LTE B41	20	41490	2680	QPSK	100	0	41490	2680	LTE B41	20	39750	2506	LTE B41	20	40620	2593	21.51	21.75	CA_41D
LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	22.67	22.81	CA_41A-41C
LTE B41	20	41490	2680	QPSK	100	0	41490	2680	LTE B41	20	39750	2506	LTE B41	20	41292	2660.2	21.58	21.75	CA_41A-41C
LTE B66	20	132072	1720	QPSK	100	0	66536	2120	LTE B66	20	66734	2139.8	LTE B66	20	66932	2159.6	22.21	22.50	CA_66D
LTE B66	20	132072	1720	QPSK	100	0	66536	2120	LTE B66	20	67187	2185.1	LTE B66	20	67286	2195	22.31	22.50	CA_66A-66B
LTE B66	20	132072	1720	QPSK	100	0	66536	2120	LTE B66	20	67038	2170.2	LTE B66	20	67236	2190	22.21	22.50	CA_66A-66C

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 Enhanced SC-FDMA, 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 V16.6.0. The conducted power measurement results of downlink LTE CA are provided as above per 3GPP TS 36.521-1 V16.6.0. 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 Superset	Index	3CC	Restriction	Completely Covered by Measurement Superset
2CC #1	CA 2C		3CC #10	3CC #1	CA 2A-2A-5A		No
2CC #2	CA 2A-2A		3CC #1	3CC #2	CA 2A-2A-13A		No
2CC #3	CA 2A-4A		3CC #3	3CC #3	CA 2A-4A-5A		No
2CC #4	CA 2A-5A		3CC #3	3CC #4	CA 2A-4A-13A		No
2CC #5	CA 2A-12A		3CC #7	3CC #5	CA 2A-5A-30A		No
2CC #6	CA 2A-13A		3CC #8	3CC #6	CA 2A-5A-66A		No
2CC #7	CA 2A-17A		No	3CC #7	CA 2A-12A-30A		No
2CC #8	CA 2A-29A	B29 SCC only	3CC #9	3CC #8	CA 2A-13A-66A		No
2CC #9	CA 2A-30A		3CC #5	3CC #9	CA 2A-29A-30A	B29 SCC only	No
2CC #10	CA 2A-66A		3CC #6	3CC #10	CA 2C-29A	B29 SCC only	No
2CC #11	CA 4A-4A		3CC #13	3CC #11	CA 2A-66B		No
2CC #12	CA 4A-5A		3CC #15	3CC #12	CA 2A-66C		No
2CC #13	CA 4A-12A		3CC #16	3CC #13	CA 4A-4A-5A		No
2CC #14	CA 4A-13A		3CC #14	3CC #14	CA 4A-4A-13A		No
2CC #15	CA 4A-17A		No	3CC #15	CA 4A-5A-30A		No
2CC #16	CA 4A-29A	B29 SCC only	3CC #17	3CC #16	CA 4A-12A-30A		No
2CC #17	CA 4A-30A		3CC #17	3CC #17	CA 4A-29A-30A	B29 SCC only	No
2CC #18	CA 5A-7A		No	3CC #18	CA 5A-66B		No
2CC #19	CA 5A-30A		3CC #5	3CC #19	CA 5A-66C		No
2CC #20	CA 5A-66A		3CC #6	3CC #20	CA 13A-66B		No
2CC #21	CA-7B		No	3CC #21	CA 13A-66C		No
2CC #22	CA-7C		No	3CC #22	CA 41D		No
2CC #23	CA-7A-7A		No	3CC #23	CA 41A-41C		No
2CC #24	CA 12A-30A		3CC #7	3CC #24	CA 66D		No
2CC #25	CA 13A-66A		3CC #8	3CC #25	CA 66A-66B		No
2CC #26	CA 29A-30A	B29 SCC only	3CC #9	3CC #26	CA 66A-66C		No
2CC #27	CA 41C		3CC #23				
2CC #28	CA 41A-41A		No				

Note:

1) The channel spacing and aggregated channel bandwidth for CA are identical to the associated specification in 3GPP TS 36.521-1 V16.6.0.

2) The reference test frequencies for CA refers to 3GPP TS 36.508 V16.6.0

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

4) 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

For WWAN, the EUT is controlled by using a Radio Communication Tester, and the communication between the EUT and the tester is established by air link. Also, the device is a laptop computer with notebook mode only, so SAR measurement for notebook mode is required.

Notebook mode

SAR is measured with display screen open at 90 degree and bottom side of keyboard 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. **UMTS:** 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)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: 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 signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

3. **UMTS:** 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}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	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_{ed1}: 47/15 β_{ed2}: 47/15	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 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
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 signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

4. **UMTS:** 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 $\beta_{hs} = 30/15 * \beta_c$.
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. **UMTS:** 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.		

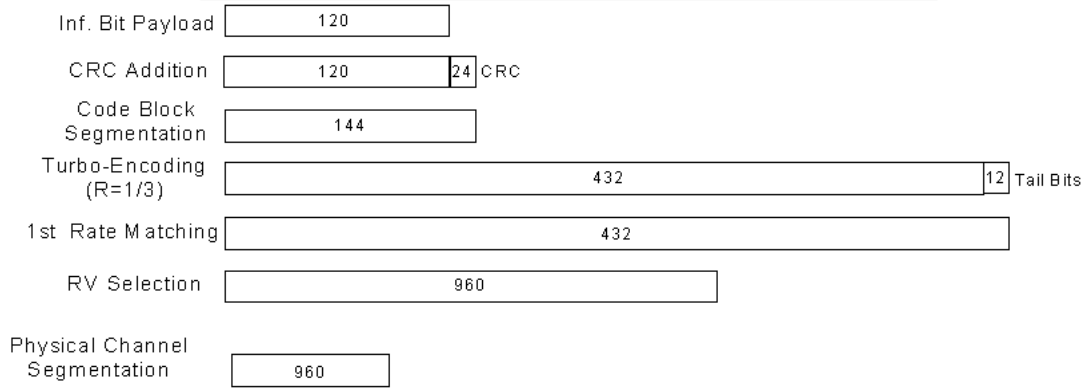


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5
Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$						
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.						
Note 3: 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 signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.						

6. **LTE:** 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 special subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4.2, the duty factor for UL-DL configuration 0/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.

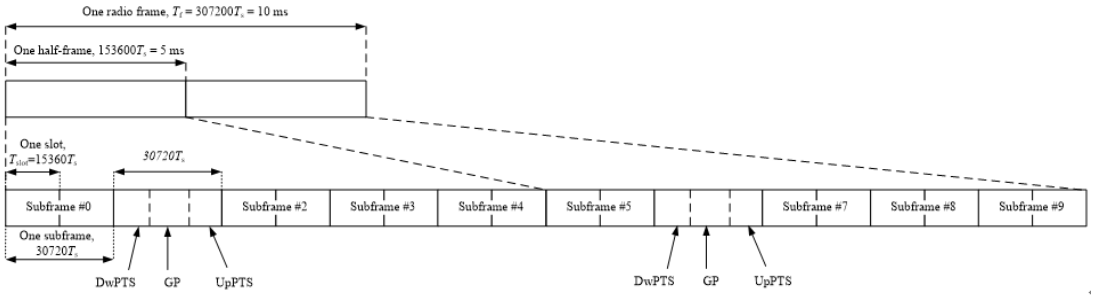


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity)

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

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	$6592 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
5	$6592 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations

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

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 6 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%.

7. **LTE downlink CA:** 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. 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. 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. When downlink carrier aggregation is active uplink maximum output power remain 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.

8. **General:** 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. 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).

9. Based on KDB 447498 D01, WLAN/BT SAR is excluded from testing based on the following table. (The Intel 9560NGW WLAN/BT module is also integrated into this host, WLAN/BT power can be referred to Intel module SAR test report, Report No.:170524-02.TR08 (FCC ID: PD99560NG).)

Mode		WLAN Main 2.45GHz	WLAN Main 5GHz	Mode		WLAN Aux 2.45GHz	WLAN Aux 5GHz	BT
Max. tune-up power(dBm)		21	21.5	Max. tune-up power(dBm)		21	21.5	11.5
Max. tune-up power(mW)		125.893	141.254	Max. tune-up power(mW)		125.893	141.254	14.125
Bottom side	Test separation distance (mm)	175	175	Bottom side	Test separation distance (mm)	175	175	175
	Calculation value	1345.598	1312.150		Calculation value	1345.598	1312.150	1345.250
	Require SAR testing?	NO	NO		Require SAR testing?	NO	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.

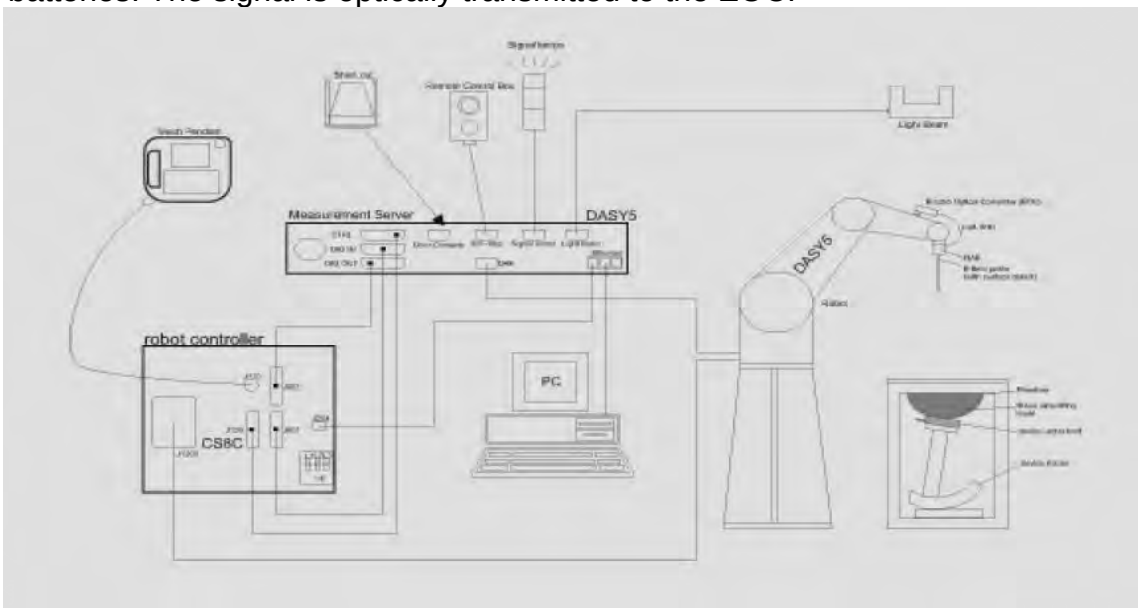


Fig. a The block diagram of SAR system

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 750/835/1750/1900/2300/2600MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 MHz to > 6 GHz	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Tip diameter: 2.5 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

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 750/835/1750/1900/2300/2600 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1 (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.

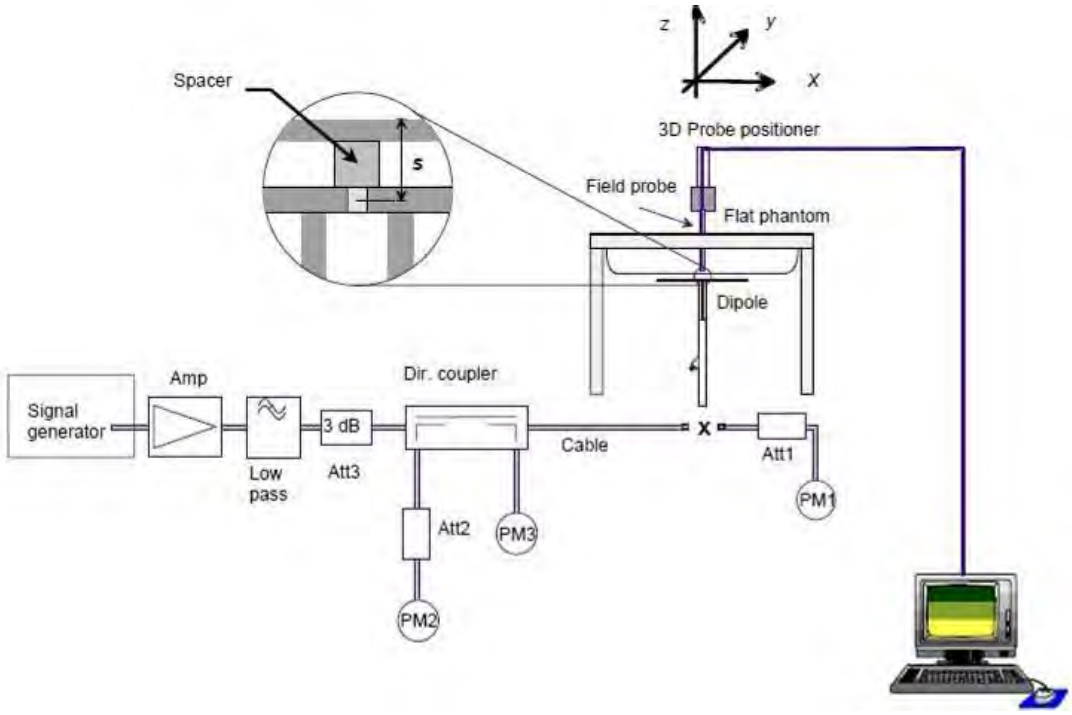


Fig. b The block diagram of system verification

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	Head	8.48	2.18	8.72	2.83%	Nov. 03, 2020
D835V2	4d063	835	Head	9.52	2.39	9.56	0.42%	Nov. 03, 2020
D1750V2	1008	1750	Head	36.00	9.08	36.32	0.89%	Nov. 04, 2020
D1900V2	5d173	1900	Head	39.40	9.72	38.88	-1.32%	Nov. 04, 2020
D2300V2	1023	2300	Head	49.00	12.20	48.80	-0.41%	Nov. 05, 2020
D2600V2	1005	2600	Head	57.30	14.60	58.40	1.92%	Nov. 06, 2020

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
Head	Nov, 03. 2020	704	42.181	0.890	42.383	0.894	0.48%	0.47%
		707.5	42.162	0.890	42.381	0.895	0.52%	0.55%
		709	42.155	0.890	42.378	0.896	0.53%	0.65%
		710	42.149	0.890	42.369	0.897	0.52%	0.76%
		711	42.144	0.890	42.362	0.898	0.52%	0.86%
		750	41.942	0.893	42.151	0.899	0.50%	0.63%
		782	41.775	0.896	42.001	0.902	0.54%	0.68%
		821.5	41.570	0.899	41.765	0.905	0.47%	0.69%
		826.4	41.545	0.899	41.757	0.906	0.51%	0.74%
		829	41.531	0.900	41.738	0.907	0.50%	0.83%
		831.5	41.518	0.900	41.726	0.908	0.50%	0.92%
		835	41.500	0.900	41.712	0.909	0.51%	1.00%
		836.5	41.500	0.902	41.712	0.909	0.51%	0.82%
		836.6	41.500	0.902	41.708	0.910	0.50%	0.92%
		841.5	41.500	0.907	41.691	0.913	0.46%	0.66%
		844	41.500	0.910	41.687	0.916	0.45%	0.69%
		846.6	41.500	0.912	41.685	0.919	0.45%	0.71%
	Nov, 04. 2020	1712.4	40.138	1.349	40.295	1.341	0.39%	-0.61%
		1720	40.126	1.354	40.291	1.345	0.41%	-0.64%
		1732.4	40.107	1.361	40.277	1.352	0.42%	-0.65%
		1732.5	40.107	1.361	40.267	1.353	0.40%	-0.58%
		1745	40.087	1.368	40.251	1.360	0.41%	-0.60%
		1750	40.079	1.371	40.247	1.363	0.42%	-0.59%
		1752.6	40.075	1.373	40.235	1.364	0.40%	-0.62%
		1770	40.047	1.383	40.191	1.375	0.36%	-0.58%
		1852.4	40.000	1.400	40.188	1.391	0.47%	-0.64%
		1860	40.000	1.400	40.176	1.392	0.44%	-0.57%
		1880	40.000	1.400	40.172	1.394	0.43%	-0.43%
		1900	40.000	1.400	40.168	1.395	0.42%	-0.36%
		1907.6	40.000	1.400	40.164	1.398	0.41%	-0.14%
	Nov, 05. 2020	2300	39.467	1.667	39.096	1.649	-0.94%	-1.06%
		2310	39.449	1.676	39.090	1.660	-0.91%	-0.93%
	Nov, 06. 2020	2506	39.129	1.861	38.793	1.842	-0.86%	-1.03%
		2510	39.124	1.865	38.787	1.846	-0.86%	-1.04%
		2535	39.092	1.893	38.760	1.874	-0.85%	-0.99%
		2549.5	39.073	1.909	38.718	1.890	-0.91%	-0.97%
		2560	39.060	1.920	38.697	1.901	-0.93%	-0.99%
		2580	39.035	1.942	38.664	1.922	-0.95%	-1.02%
		2593	39.018	1.956	38.655	1.936	-0.93%	-1.02%
		2595	39.015	1.958	38.651	1.939	-0.93%	-0.98%
		2600	39.009	1.964	38.646	1.945	-0.93%	-0.95%
		2610	38.996	1.975	38.638	1.955	-0.92%	-0.99%
		2636.5	38.963	2.003	38.604	1.984	-0.92%	-0.97%
		2680	38.907	2.051	38.569	2.030	-0.87%	-1.02%

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	Head	—	532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
850	Head	—	532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
1750	Head	444.52 g	552.42 g	3.06 g	—	—	—	1.0L(Kg)
1900	Head	444.52 g	552.42 g	3.06 g	—	—	—	1.0L(Kg)
2300	Head	550ml	450ml	—	—	—	—	1.0L(Kg)
2600	Head	550ml	450ml	—	—	—	—	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

2.1 Decision rules

Reported measurement data comply with IEEE 1528-2013:

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.2 Summary of Results

WCDMA Band II / Band IV / Band V

Band	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	24.5	24.01	111.94%	0.009	0.010	-
	Bottom side	0	9400	1880	24.5	24.05	110.92%	0.015	0.017	72
	Bottom side	0	9538	1907.6	24.5	24.32	104.23%	0.015	0.015	-
WCDMA Band IV	Bottom side	0	1312	1712.4	24.5	24.01	111.94%	0.008	0.009	73
	Bottom side	0	1412	1732.4	24.5	24.07	110.41%	0.006	0.006	-
	Bottom side	0	1513	1752.6	24.5	24.46	100.93%	0.006	0.006	-
WCDMA Band V	Bottom side	0	4132	826.4	24.5	23.84	116.41%	0.009	0.011	-
	Bottom side	0	4183	836.6	24.5	23.94	113.76%	0.011	0.013	74
	Bottom side	0	4233	846.6	24.5	23.75	118.85%	0.010	0.012	-

LTE FDD Band 2 / Band 4 / Band 5 / Band 7 / Band 12 / Band 13 / Band 17 / Band 26 / Band 30 / Band 66 / LTE TDD Band 38 / Band 41

Band	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 2	20MHz	QPSK	1 RB	0	Bottom side	0	18700	1860	24	23.47	112.98%	0.004	0.005	-
					Bottom side	0	18900	1880	24	23.31	117.22%	0.013	0.015	75
					Bottom side	0	19100	1900	24	23.42	114.29%	0.012	0.014	-
			50 RB	50	Bottom side	0	19100	1900	23	22.58	110.15%	0.010	0.011	-
			100 RB		Bottom side	0	19100	1900	23	22.59	109.90%	0.010	0.011	-
LTE Band 4	20MHz	QPSK	1 RB	50	Bottom side	0	20050	1720	24	23.44	113.76%	0.007	0.008	76
				99	Bottom side	0	20175	1732.5	24	23.40	114.82%	0.006	0.007	-
					Bottom side	0	20300	1745	24	23.84	103.75%	0.006	0.006	-
			50 RB	50	Bottom side	0	20300	1745	23	22.82	104.23%	0.005	0.005	-
			100 RB		Bottom side	0	20300	1745	23	22.74	106.17%	0.005	0.005	-
LTE Band 5	10MHz	QPSK	1 RB	0	Bottom side	0	20450	829	25	23.45	142.89%	0.010	0.014	-
					Bottom side	0	20525	836.5	25	23.51	140.93%	0.011	0.016	77
					Bottom side	0	20600	844	25	23.22	150.66%	0.009	0.013	-
			25 RB	25	Bottom side	0	20450	829	24	22.55	139.64%	0.009	0.012	-
			50 RB		Bottom side	0	20450	829	24	22.41	144.21%	0.009	0.013	-
LTE Band 7	20MHz	QPSK	1 RB	99	Bottom side	0	20850	2510	24	23.10	123.03%	0.008	0.010	-
					Bottom side	0	21100	2535	24	23.02	125.31%	0.006	0.008	-
					Bottom side	0	21350	2560	24	22.97	126.77%	0.009	0.011	78
			50 RB	50	Bottom side	0	20850	2510	23	22.04	124.74%	0.006	0.007	-
			100 RB		Bottom side	0	20850	2510	23	22.08	123.59%	0.008	0.010	-
LTE Band 12	10MHz	QPSK	1 RB	25	Bottom side	0	23130	711	24	23.21	119.95%	0.013	0.016	79
				49	Bottom side	0	23060	704	24	23.29	117.76%	0.013	0.015	-
					Bottom side	0	23095	707.5	24	23.31	117.22%	0.013	0.015	-
			25 RB	25	Bottom side	0	23095	707.5	23	22.34	116.41%	0.012	0.014	-
			50 RB		Bottom side	0	23060	704	23	22.34	116.41%	0.012	0.014	-
LTE Band 13	10MHz	QPSK	1 RB	0	Bottom side	0	23230	782	24	23.35	116.14%	0.016	0.019	80
				25	Bottom side	0	23230	782	24	23.30	117.49%	0.013	0.015	-
				49	Bottom side	0	23230	782	24	23.19	120.50%	0.012	0.014	-
			25 RB	0	Bottom side	0	23230	782	23	22.41	114.55%	0.012	0.014	-
			50 RB		Bottom side	0	23230	782	23	22.30	117.49%	0.013	0.015	-
LTE Band 17	10MHz	QPSK	1 RB	25	Bottom side	0	23790	710	24	23.09	123.31%	0.015	0.018	81
					Bottom side	0	23800	711	24	23.13	122.18%	0.014	0.017	-
				49	Bottom side	0	23780	709	24	23.23	119.40%	0.014	0.017	-
			25 RB	25	Bottom side	0	23790	710	23	22.32	116.95%	0.012	0.014	-
			50 RB		Bottom side	0	23780	709	23	22.19	120.50%	0.013	0.016	-
LTE Band 26	15MHz	QPSK	1 RB	0	Bottom side	0	26965	841.5	24	23.01	125.60%	0.007	0.009	-
				36	Bottom side	0	26865	831.5	24	23.28	118.03%	0.008	0.010	82
				74	Bottom side	0	26765	821.5	24	23.19	120.50%	0.008	0.009	-
			36 RB	18	Bottom side	0	26865	831.5	23	22.30	117.49%	0.008	0.009	-
			75 RB		Bottom side	0	26865	831.5	23	22.49	112.46%	0.008	0.009	-
LTE Band 30	10MHz	QPSK	1 RB	0	Bottom side	0	27710	2310	24	23.11	122.74%	0.020	0.025	-
				25	Bottom side	0	27710	2310	24	22.96	127.06%	0.023	0.029	-
				49	Bottom side	0	27710	2310	24	23.05	124.45%	0.025	0.031	83
			25 RB	0	Bottom side	0	27710	2310	23	22.19	120.50%	0.019	0.023	-
			50 RB		Bottom side	0	27710	2310	23	22.08	123.59%	0.021	0.026	-
LTE Band 38	20MHz	QPSK	1 RB	0	Bottom side	0	37850	2580	24	22.63	137.09%	0.006	0.009	-
				99	Bottom side	0	38000	2595	24	22.79	132.13%	0.006	0.008	-
					Bottom side	0	38150	2610	24	22.81	131.52%	0.007	0.009	84
			50 RB	50	Bottom side	0	38150	2610	23	21.67	135.83%	0.007	0.009	-
			100 RB		Bottom side	0	38150	2610	23	21.66	136.14%	0.007	0.009	-
LTE Band 41	20MHz	QPSK	1 RB	0	Bottom side	0	39750	2506	24	22.81	131.52%	0.006	0.008	-
					Bottom side	0	40185	2549.5	24	22.94	127.64%	0.005	0.007	-
					Bottom side	0	41055	2636.5	24	23.03	125.03%	0.006	0.008	-
					Bottom side	0	41490	2680	24	22.90	128.82%	0.007	0.009	85
				99	Bottom side	0	40620	2593	24	22.93	127.94%	0.007	0.009	-
			50 RB	0	Bottom side	0	41055	2636.5	23	21.83	130.92%	0.007	0.009	-
			100 RB		Bottom side	0	41055	2636.5	23	21.80	131.83%	0.006	0.008	-
LTE Band 66	20MHz	QPSK	1 RB	0	Bottom side	0	132572	1770	24	23.85	103.51%	0.006	0.007	-
				50	Bottom side	0	132072	1720	24	23.36	115.88%	0.007	0.008	86
				99	Bottom side	0	132322	1745	24	23.74	106.17%	0.006	0.006	-
			50 RB	50	Bottom side	0	132322	1745	23	22.84	103.75%	0.005	0.006	-
			100 RB		Bottom side	0	132322	1745	23	22.76	105.68%	0.005	0.005	-

Note:

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

Reported SAR = measured SAR * (scaling)

Where P2 is maximum specified power, P1 is measured conducted power

2.3 Reporting statements of conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

NO.	Simultaneous Transmit Configurations	Body
1	WWAN + 2.4GHz MIMO	YES
2	WWAN + 5GHz MIMO	YES
3	WWAN + 2.4GHz Chain B+ BT Chain A	YES
4	WWAN + 5GHz Chain B+ BT Chain A	YES
5	WWAN + 5GHz MIMO + BT Chain A	YES

Note :
1. The Intel 9560NGW WLAN/BT module is also integrated into this host, WLAN/BT power can be referred to Intel module SAR test report, Report No.:170524-02.TR08 (FCC ID:PD99560NG).
2. Since WLAN/BT is excluded from testing and the test separation distance for WLAN/BT is > 50mm, the estimated 1g-SAR is 0.4 for WLAN and BT.

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:

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

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

3.2 SPLSR evaluation and analysis

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

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

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

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

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

WWAN	Exposure position 1g(W/kg)	1	2	3	4	5	6	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
		WWAN	WLAN 2.4GHz Chain A	WLAN 2.4GHz Chain B	WLAN 5GHz Chain A	WLAN 5GHz Chain B	BT (Chain A)	1+2+3 Sum	1+4+5 Sum	1+3+6 Sum	1+5+6 Sum	1+4+5+6 Sum
WCDMA II	Laptop_Bottom	0.017	0.40	0.40	0.40	0.40	0.40	0.817	0.817	0.817	0.817	1.217
WCDMA IV	Laptop_Bottom	0.009	0.40	0.40	0.40	0.40	0.40	0.809	0.809	0.809	0.809	1.209
WCDMA V	Laptop_Bottom	0.013	0.40	0.40	0.40	0.40	0.40	0.813	0.813	0.813	0.813	1.213
LTE B2	Laptop_Bottom	0.015	0.40	0.40	0.40	0.40	0.40	0.815	0.815	0.815	0.815	1.215
LTE B4	Laptop_Bottom	0.008	0.40	0.40	0.40	0.40	0.40	0.808	0.808	0.808	0.808	1.208
LTE B5	Laptop_Bottom	0.016	0.40	0.40	0.40	0.40	0.40	0.816	0.816	0.816	0.816	1.216
LTE B7	Laptop_Bottom	0.011	0.40	0.40	0.40	0.40	0.40	0.811	0.811	0.811	0.811	1.211
LTE B12	Laptop_Bottom	0.016	0.40	0.40	0.40	0.40	0.40	0.816	0.816	0.816	0.816	1.216
LTE B13	Laptop_Bottom	0.019	0.40	0.40	0.40	0.40	0.40	0.819	0.819	0.819	0.819	1.219
LTE B17	Laptop_Bottom	0.018	0.40	0.40	0.40	0.40	0.40	0.818	0.818	0.818	0.818	1.218
LTE B26	Laptop_Bottom	0.010	0.40	0.40	0.40	0.40	0.40	0.810	0.810	0.810	0.810	1.210
LTE B30	Laptop_Bottom	0.031	0.40	0.40	0.40	0.40	0.40	0.831	0.831	0.831	0.831	1.231
LTE B38	Laptop_Bottom	0.009	0.40	0.40	0.40	0.40	0.40	0.809	0.809	0.809	0.809	1.209
LTE B41	Laptop_Bottom	0.009	0.40	0.40	0.40	0.40	0.40	0.809	0.809	0.809	0.809	1.209
LTE B66	Laptop_Bottom	0.008	0.40	0.40	0.40	0.40	0.40	0.808	0.808	0.808	0.808	1.208

Conclusion:

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

3. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	7466	Feb.04,2020	Feb.03,2021
SPEAG	System Validation Dipole	D750V3	1015	Aug.13,2020	Aug.12,2021
		D835V2	4d063	Aug.13,2020	Aug.12,2021
		D1750V2	1008	Aug.14,2020	Aug.13,2021
		D1900V2	5d173	Apr.22,2020	Apr.21,2021
		D2300V2	1023	Aug.13,2020	Aug.12,2021
		D2600V2	1005	Jan.29,2020	Jan.28,2021
SPEAG	Data acquisition Electronics	DAE4	1336	Aug.13,2020	Aug.12,2021
SPEAG	Software	DASY 52 V52.10.4	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	ELI	N/A	Calibration not required	Calibration not required
Agilent	Network Analyzer	E5071C	MY46100433	Dec.13,2019	Dec.12,2020
Agilent	Dielectric Probe Kit	85070E	MY44300677	Calibration not required	Calibration not required
Agilent	Dual-directional coupler	772D	MY46151242	Aug.17,2020	Aug.16,2021
		778D	MY48220468	Aug.17,2020	Aug.16,2021
Agilent	RF Signal Generator	N5181A	MY50141235	May.04,2020	May.03,2021
Agilent	Power Meter	E4417A	MY51410006	Mar.09,2020	Mar.08,2021
Agilent	Power Sensor	E9301H	MY51470001	Mar.09,2020	Mar.08,2021
			MY51470002	Mar.09,2020	Mar.08,2021

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
TECPEL	Digital thermometer	DTM-303A	TP130074	Apr.10,2020	Apr.09,2021
Anritsu	Radio Communication Test	MT8820C	6201061014	Apr.28,2020	Apr.27,2021
R&S	Radio Communication Test	CMW 500	125470	Dec.11,2019	Dec.11,2020

4. Measurements

Date: 2020/11/4

Report No. : E5/2020/A0002

WCDMA Band II_Body_Bottom side_CH 9400_0mm

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

Medium parameters used: f = 1880 MHz; σ = 1.394 S/m; ε_r = 40.172; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.56, 8.56, 8.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0202 W/kg

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

Reference Value = 1.299 V/m; Power Drift = 0.02 dB

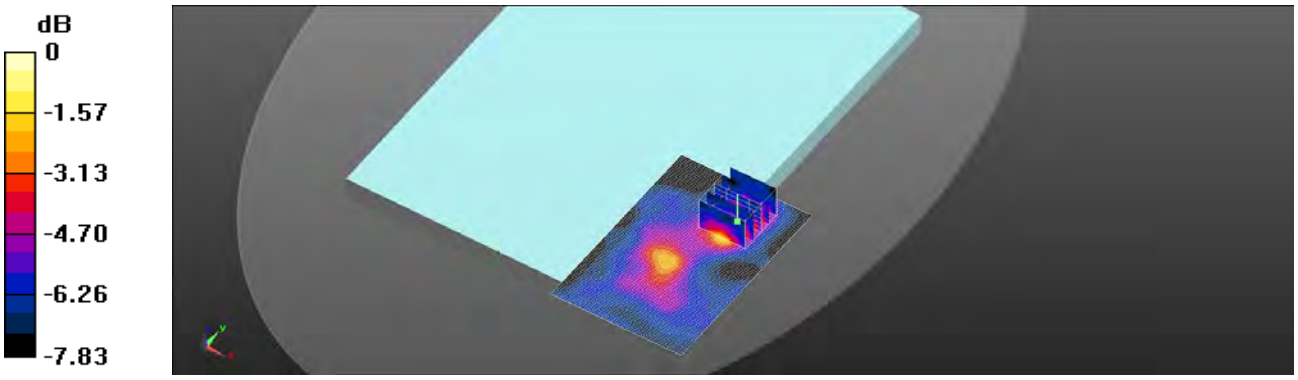
Peak SAR (extrapolated) = 0.0230 W/kg

SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.00939 W/kg

Smallest distance from peaks to all points 3 dB below = 11.5 mm

Ratio of SAR at M2 to SAR at M1 = 72%

Maximum value of SAR (measured) = 0.0191 W/kg



0 dB = 0.0191 W/kg = -17.19 dBW/kg

Date: 2020/11/4

Report No. : E5/2020/A0002

WCDMA Band IV_Body_Bottom side_CH 1312_0mm

Communication System: WCDMA; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1712.4 MHz; σ = 1.341 S/m; ε_r = 40.295; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.94, 8.94, 8.94); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.00948 W/kg

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

Reference Value = 1.357 V/m; Power Drift = 0.06 dB

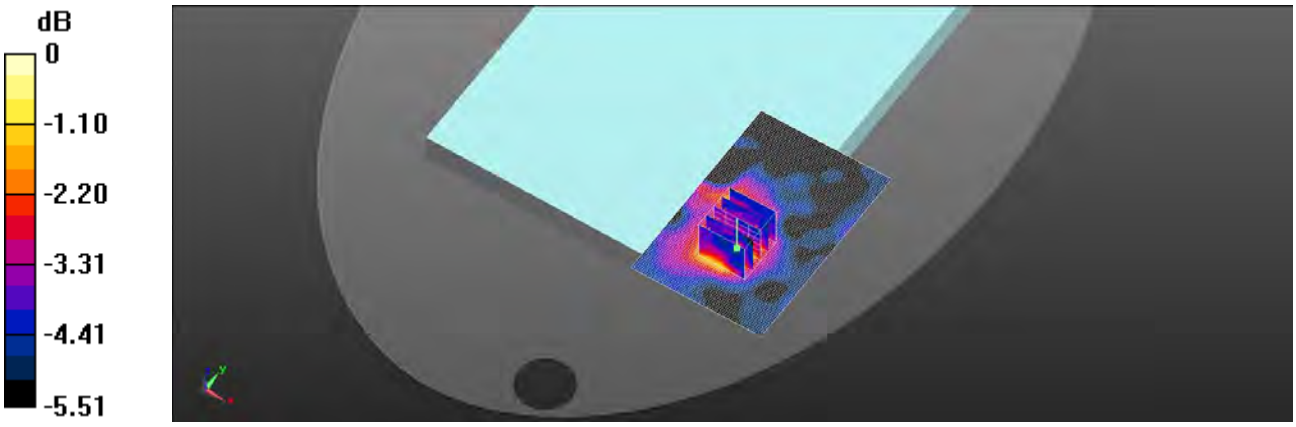
Peak SAR (extrapolated) = 0.0110 W/kg

SAR(1 g) = 0.00785 W/kg; SAR(10 g) = 0.00582 W/kg

Smallest distance from peaks to all points 3 dB below = 11.7 mm

Ratio of SAR at M2 to SAR at M1 = 73.5%

Maximum value of SAR (measured) = 0.00976 W/kg



0 dB = 0.00976 W/kg = -20.10 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002

WCDMA Band V_Body_Bottom side_CH 4183_0mm

Communication System: WCDMA; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: f = 837 MHz; σ = 0.91 S/m; ε_r = 41.708; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.32, 10.32, 10.32); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0129 W/kg

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

Reference Value = 1.369 V/m; Power Drift = 0.01 dB

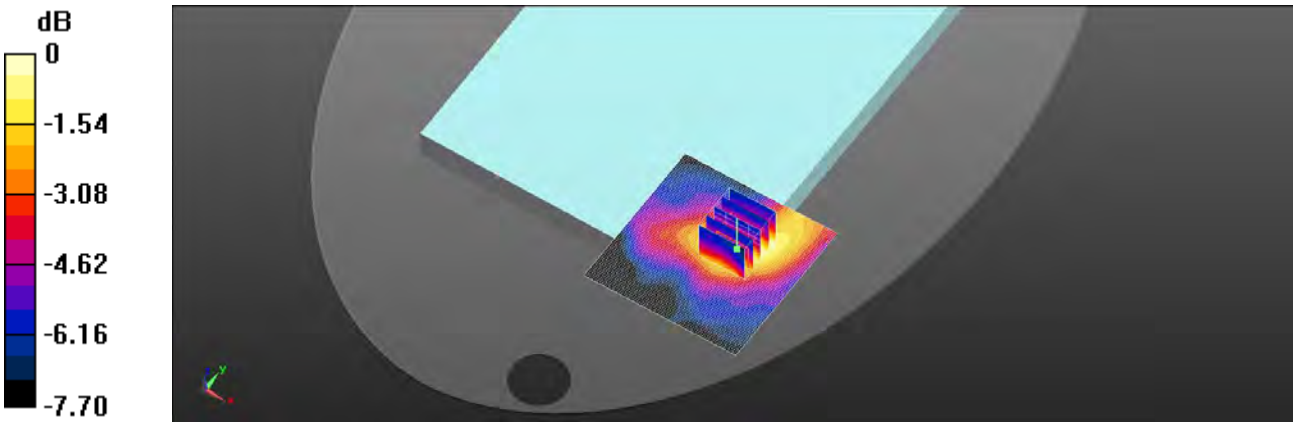
Peak SAR (extrapolated) = 0.0150 W/kg

SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00763 W/kg

Smallest distance from peaks to all points 3 dB below = 11.9 mm

Ratio of SAR at M2 to SAR at M1 = 73.4%

Maximum value of SAR (measured) = 0.0131 W/kg



0 dB = 0.0131 W/kg = -18.82 dBW/kg

Date: 2020/11/4

Report No. : E5/2020/A0002

LTE Band 2 (20MHz)_Body_Bottom side_CH 18900_QPSK_1-0_0mm

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

Medium parameters used: f = 1880 MHz; σ = 1.394 S/m; ε_r = 40.172; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.56, 8.56, 8.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x91x1): 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 = 1.575 V/m; Power Drift = 0.02 dB

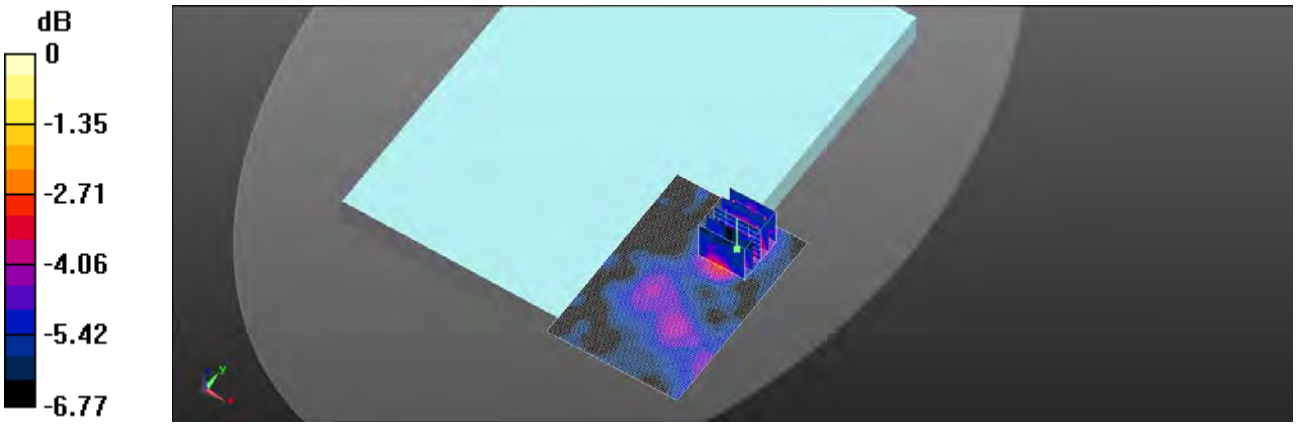
Peak SAR (extrapolated) = 0.0210 W/kg

SAR(1 g) = 0.013 W/kg; SAR(10 g) = 0.00811 W/kg

Smallest distance from peaks to all points 3 dB below = 10.1 mm

Ratio of SAR at M2 to SAR at M1 = 67.4%

Maximum value of SAR (measured) = 0.0155 W/kg



0 dB = 0.0155 W/kg = -18.11 dBW/kg

Date: 2020/11/4

Report No. : E5/2020/A0002

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 = 1.345 S/m; ε_r = 40.291; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.94, 8.94, 8.94); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.00852 W/kg

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

Reference Value = 1.413 V/m; Power Drift = 0.05 dB

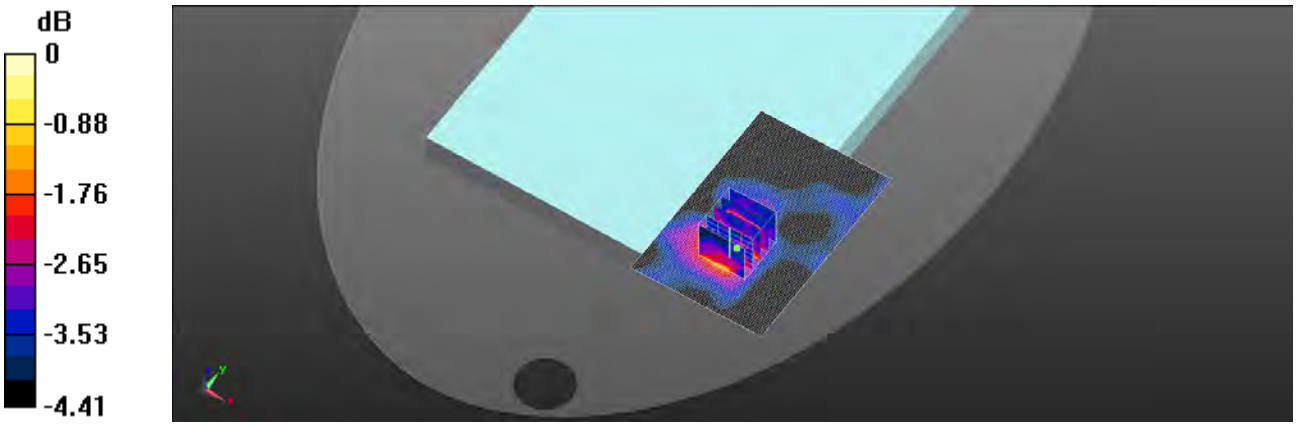
Peak SAR (extrapolated) = 0.00923 W/kg

SAR(1 g) = 0.0067 W/kg; SAR(10 g) = 0.00534 W/kg

Smallest distance from peaks to all points 3 dB below = 11.8 mm

Ratio of SAR at M2 to SAR at M1 = 73.5%

Maximum value of SAR (measured) = 0.00834 W/kg



0 dB = 0.00834 W/kg = -20.79 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002

LTE Band 5 (10MHz)_Body_Bottom side_CH 20525_QPSK_1-0_0mm

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

Medium parameters used: f = 836.5 MHz; σ = 0.909 S/m; ε_r = 41.712; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.32, 10.32, 10.32); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0128 W/kg

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

Reference Value = 1.269 V/m; Power Drift = 0.03 dB

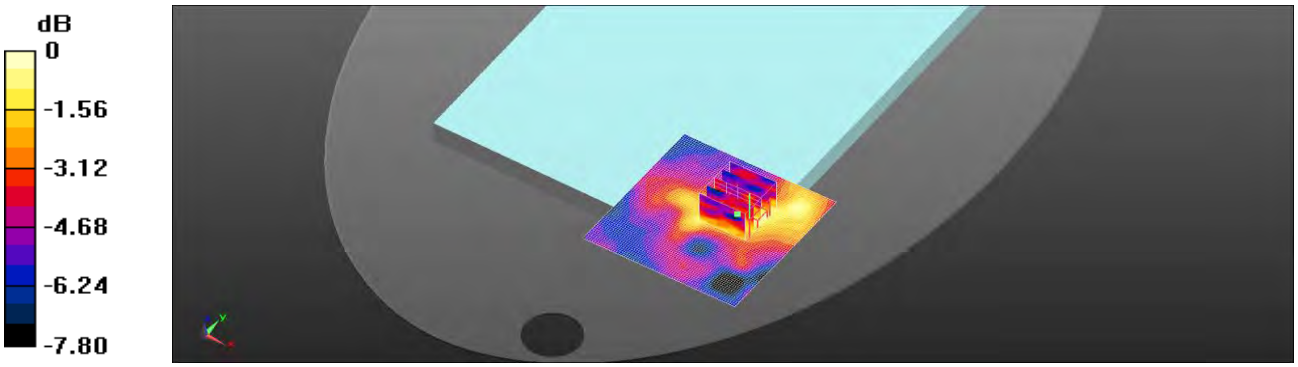
Peak SAR (extrapolated) = 0.0130 W/kg

SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00789 W/kg

Smallest distance from peaks to all points 3 dB below = 11.3 mm

Ratio of SAR at M2 to SAR at M1 = 70.8%

Maximum value of SAR (measured) = 0.0130 W/kg



0 dB = 0.0130 W/kg = -18.87 dBW/kg

Date: 2020/11/6

Report No. : E5/2020/A0002

LTE Band 7 (20MHz)_Body_Bottom side_CH 21350_QPSK_1-99_0mm

Communication System: LTE; Frequency: 2560 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2560 MHz; σ = 1.901 S/m; ε_r = 38.697; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(7.53, 7.53, 7.53); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0154 W/kg

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

Reference Value = 1.391 V/m; Power Drift = 0.04 dB

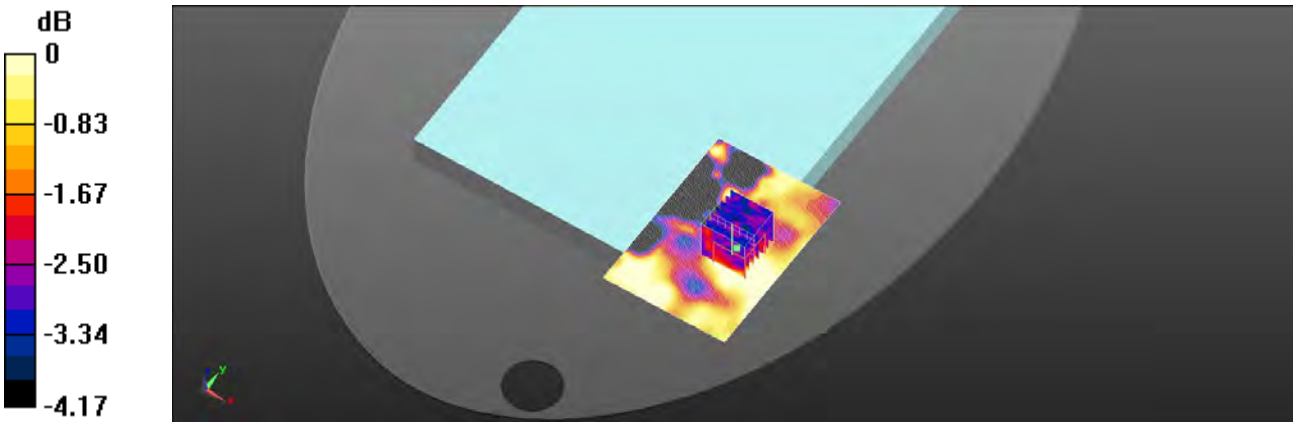
Peak SAR (extrapolated) = 0.0130 W/kg

SAR(1 g) = 0.00855 W/kg; SAR(10 g) = 0.00679 W/kg

Smallest distance from peaks to all points 3 dB below = 11.5 mm

Ratio of SAR at M2 to SAR at M1 = 73.6%

Maximum value of SAR (measured) = 0.0109 W/kg



0 dB = 0.0109 W/kg = -19.63 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002

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

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

Medium parameters used: f = 711 MHz; σ = 0.898 S/m; ε_r = 42.362; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.7°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.56, 10.56, 10.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0154 W/kg

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

Reference Value = 1.193 V/m; Power Drift = 0.02 dB

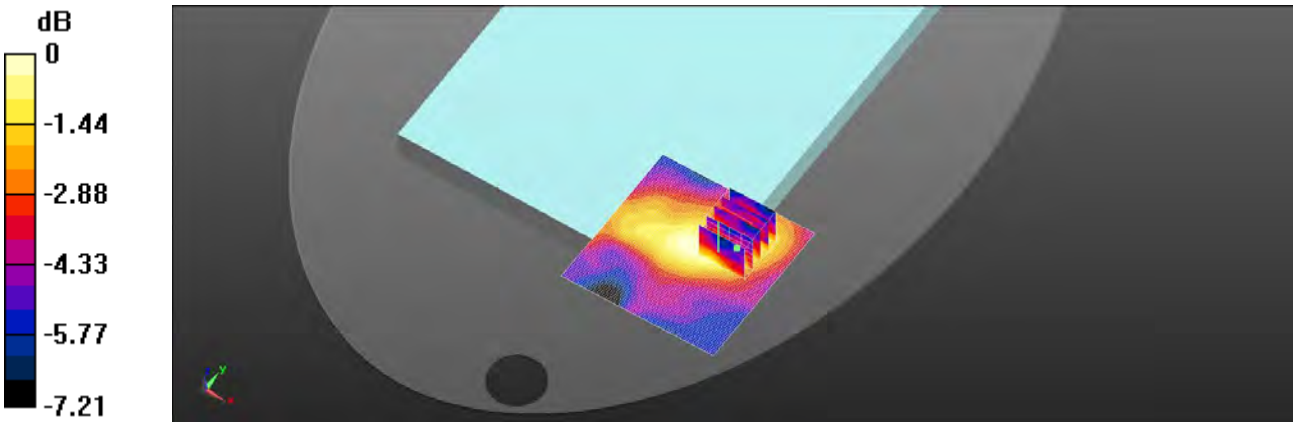
Peak SAR (extrapolated) = 0.0170 W/kg

SAR(1 g) = 0.013 W/kg; SAR(10 g) = 0.00969 W/kg

Smallest distance from peaks to all points 3 dB below = 12.2 mm

Ratio of SAR at M2 to SAR at M1 = 80.5%

Maximum value of SAR (measured) = 0.0149 W/kg



0 dB = 0.0149 W/kg = -18.26 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002

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

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

Medium parameters used: f = 782 MHz; σ = 0.902 S/m; ε_r = 42.001; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.7°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.56, 10.56, 10.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0210 W/kg

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

Reference Value = 1.140 V/m; Power Drift = 0.04 dB

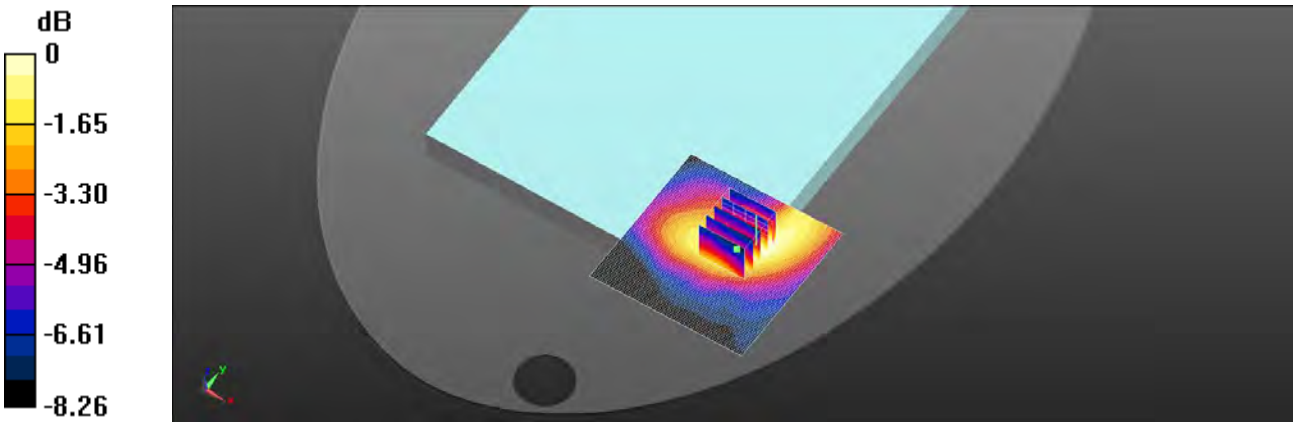
Peak SAR (extrapolated) = 0.0220 W/kg

SAR(1 g) = 0.016 W/kg; SAR(10 g) = 0.011 W/kg

Smallest distance from peaks to all points 3 dB below = 11.5 mm

Ratio of SAR at M2 to SAR at M1 = 73.1%

Maximum value of SAR (measured) = 0.0191 W/kg



0 dB = 0.0191 W/kg = -17.18 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002

LTE Band 17 (10MHz)_Body_Bottom side_CH 23790_QPSK_1-25_0mm

Communication System: LTE; Frequency: 710 MHz; Duty Cycle: 1:1

Medium parameters used: f = 710 MHz; σ = 0.897 S/m; ε_r = 42.369; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.7°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.56, 10.56, 10.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0179 W/kg

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

Reference Value = 1.041 V/m; Power Drift = -0.02 dB

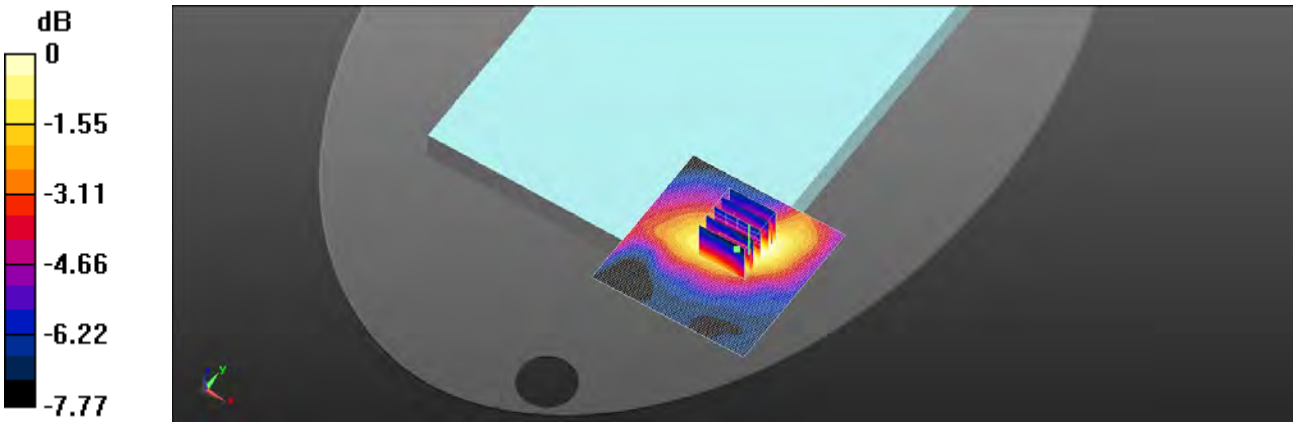
Peak SAR (extrapolated) = 0.0210 W/kg

SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.011 W/kg

Smallest distance from peaks to all points 3 dB below = 11.1 mm

Ratio of SAR at M2 to SAR at M1 = 72.7%

Maximum value of SAR (measured) = 0.0177 W/kg



0 dB = 0.0177 W/kg = -17.53 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002

LTE Band 26 (15MHz)_Body_Bottom side_CH 26865_QPSK_1-36_0mm

Communication System: LTE; Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium parameters used: f = 831.5 MHz; σ = 0.908 S/m; ε_r = 41.726; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.32, 10.32, 10.32); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0101 W/kg

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

Reference Value = 1.173 V/m; Power Drift = 0.03 dB

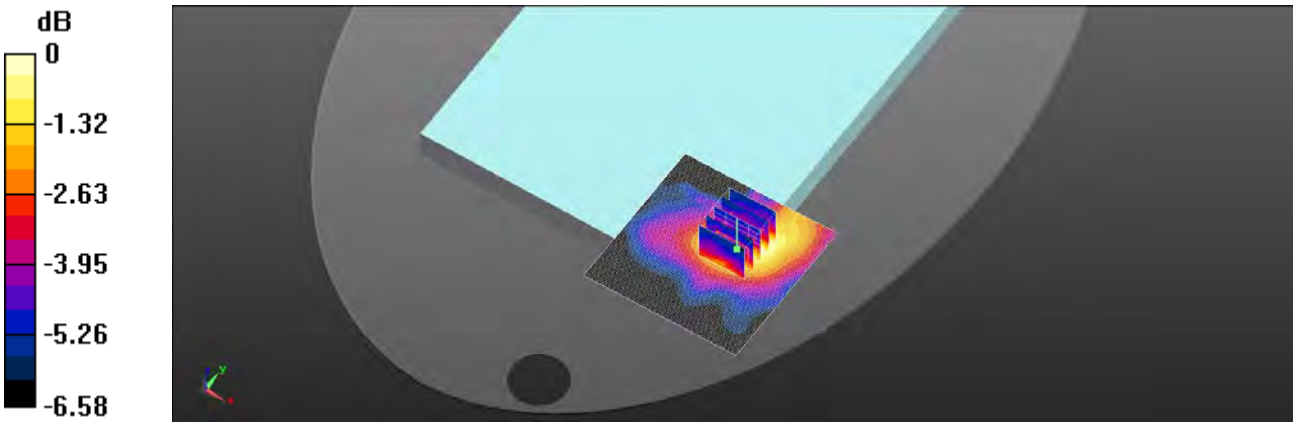
Peak SAR (extrapolated) = 0.0110 W/kg

SAR(1 g) = 0.00843 W/kg; SAR(10 g) = 0.006 W/kg

Smallest distance from peaks to all points 3 dB below = 12.1 mm

Ratio of SAR at M2 to SAR at M1 = 80.2%

Maximum value of SAR (measured) = 0.00988 W/kg



0 dB = 0.00988 W/kg = -20.05 dBW/kg

Date: 2020/11/5

Report No. : E5/2020/A0002

LTE Band 30 (20MHz)_Body_Bottom side_CH 27710_QPSK_1-49_0mm

Communication System: LTE; Frequency: 2310 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2310 MHz; σ = 1.66 S/m; ε_r = 39.09; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.08, 8.08, 8.08); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x131x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0352 W/kg

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

Reference Value = 1.993 V/m; Power Drift = 0.05 dB

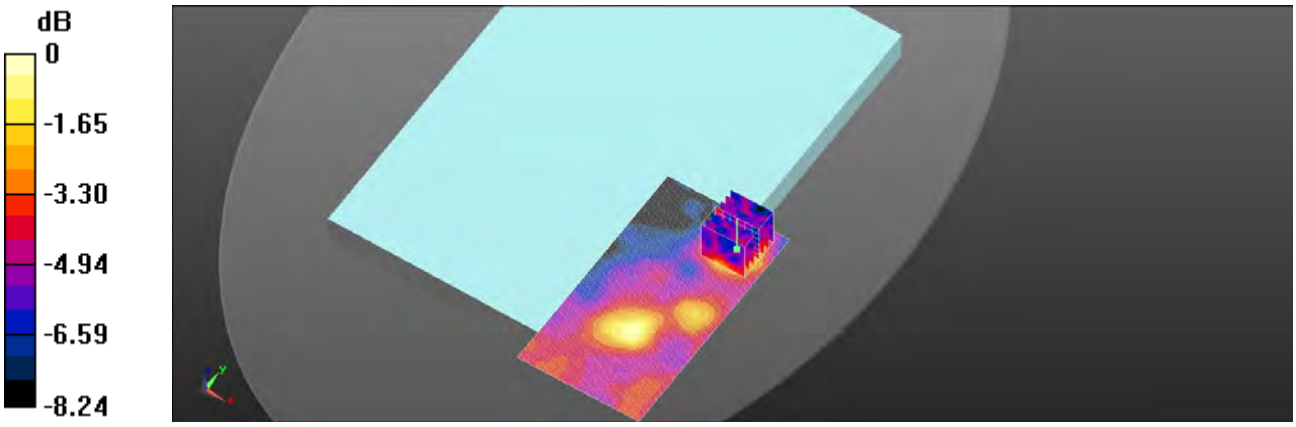
Peak SAR (extrapolated) = 0.0370 W/kg

SAR(1 g) = 0.025 W/kg; SAR(10 g) = 0.016 W/kg

Smallest distance from peaks to all points 3 dB below = 11.1 mm

Ratio of SAR at M2 to SAR at M1 = 70.9%

Maximum value of SAR (measured) = 0.0337 W/kg



0 dB = 0.0337 W/kg = -14.73 dBW/kg

Date: 2020/11/6

Report No. : E5/2020/A0002

LTE Band 38 (20MHz)_Body_Bottom side_CH 38150_QPSK_1-99_0mm

Communication System: LTE; Frequency: 2610 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2610 MHz; σ = 1.955 S/m; ε_r = 38.638; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(7.53, 7.53, 7.53); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x131x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0276 W/kg

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

Reference Value = 1.530 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.0120 W/kg

SAR(1 g) = 0.00705 W/kg; SAR(10 g) = 0.0056 W/kg

Smallest distance from peaks to all points 3 dB below = 11.4 mm

Ratio of SAR at M2 to SAR at M1 = 73.4%

Maximum value of SAR (measured) = 0.00922 W/kg

0 dB = 0.00922 W/kg = -20.35 dBW/kg

Date: 2020/11/6

Report No. : E5/2020/A0002

LTE Band 41 (20MHz)_Body_Bottom side_CH 41490_QPSK_1-0_0mm

Communication System: LTE; Frequency: 2680 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2680 MHz; σ = 2.03 S/m; ε_r = 38.569; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(7.53, 7.53, 7.53); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x131x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0160 W/kg

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

Reference Value = 1.519 V/m; Power Drift = 0.06 dB

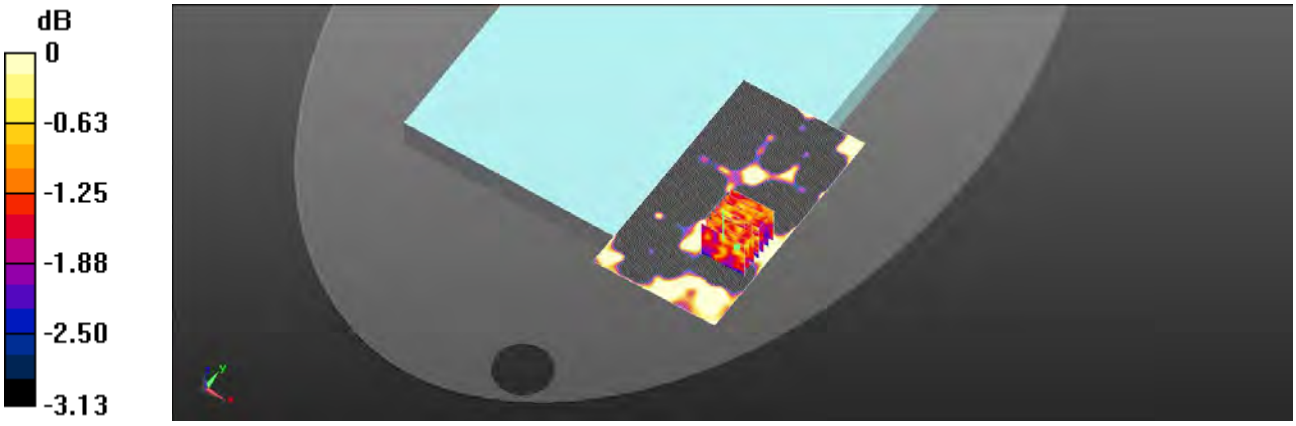
Peak SAR (extrapolated) = 0.0180 W/kg

SAR(1 g) = 0.00735 W/kg; SAR(10 g) = 0.00629 W/kg

Smallest distance from peaks to all points 3 dB below = 11.7 mm

Ratio of SAR at M2 to SAR at M1 = 74.8%

Maximum value of SAR (measured) = 0.00880 W/kg



0 dB = 0.00880 W/kg = -20.56 dBW/kg

Date: 2020/11/4

Report No. : E5/2020/A0002

LTE Band 66 (20MHz)_Body_Bottom side_CH 132072_QPSK_1-50_0mm

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

Medium parameters used: f = 1720 MHz; σ = 1.345 S/m; ε_r = 40.291; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.94, 8.94, 8.94); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.00685 W/kg

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

Reference Value = 1.447 V/m; Power Drift = -0.05 dB

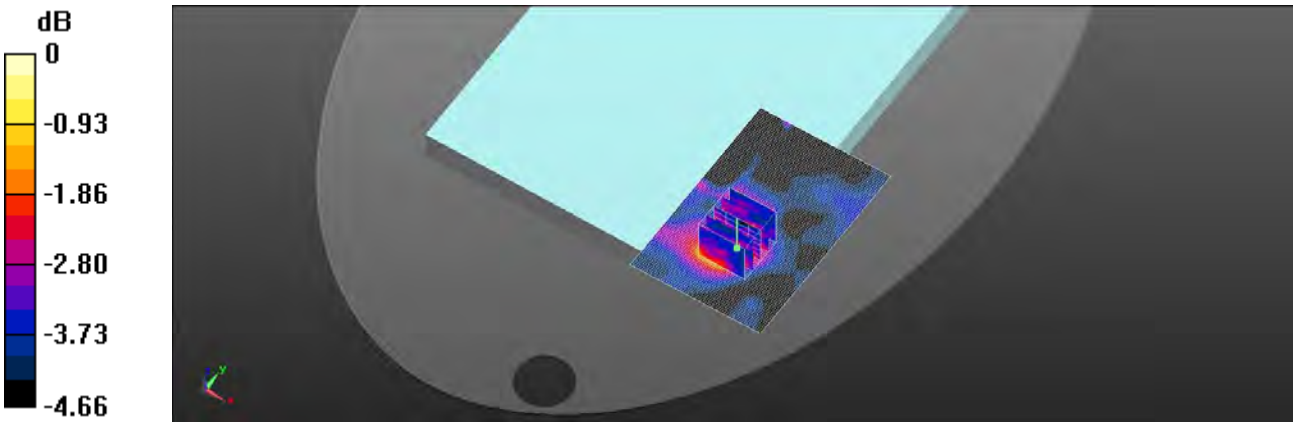
Peak SAR (extrapolated) = 0.0110 W/kg

SAR(1 g) = 0.00683 W/kg; SAR(10 g) = 0.0052 W/kg

Smallest distance from peaks to all points 3 dB below = 10.9 mm

Ratio of SAR at M2 to SAR at M1 = 70.7%

Maximum value of SAR (measured) = 0.00830 W/kg



0 dB = 0.00830 W/kg = -20.81 dBW/kg

5. SAR System Performance Verification

Date: 2020/11/3

Report No. : E5/2020/A0002

Dipole 750 MHz_SN:1015

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

Medium parameters used: f = 750 MHz; σ = 0.899 S/m; ε_r = 42.151; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.7°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.56, 10.56, 10.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (51x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.50 W/kg

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

Reference Value = 60.03 V/m; Power Drift = 0.04 dB

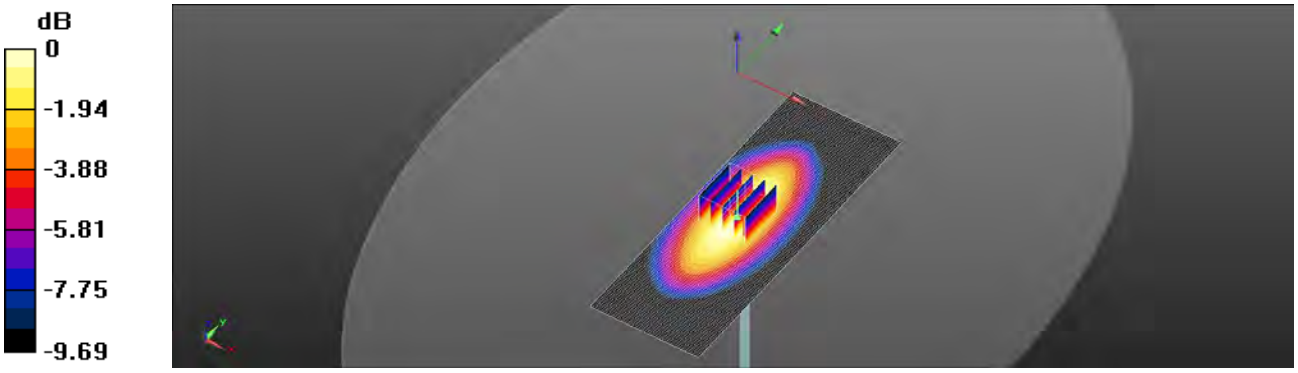
Peak SAR (extrapolated) = 2.94 W/kg

SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.43 W/kg

Smallest distance from peaks to all points 3 dB below = 10.7 mm

Ratio of SAR at M2 to SAR at M1 = 68.8%

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



0 dB = 2.53 W/kg = 4.03 dBW/kg

Date: 2020/11/3

Report No. : E5/2020/A0002
Dipole 835 MHz_SN:4d063

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

Medium parameters used: f = 835 MHz; σ = 0.909 S/m; ε_r = 41.712; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(10.32, 10.32, 10.32); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (51x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 2.82 W/kg

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

Reference Value = 61.07 V/m; Power Drift = 0.05 dB

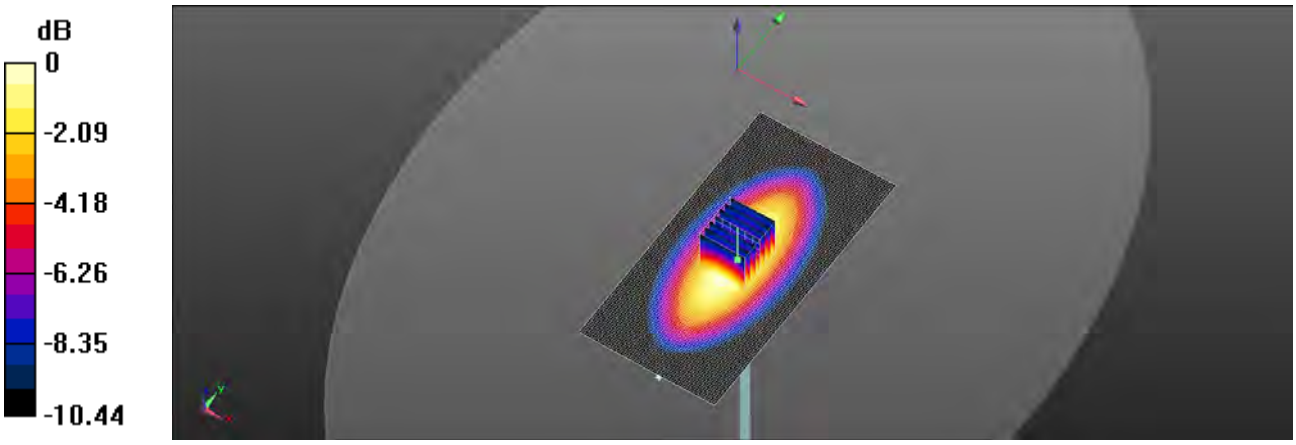
Peak SAR (extrapolated) = 3.34 W/kg

SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.57 W/kg

Smallest distance from peaks to all points 3 dB below = 9.8 mm

Ratio of SAR at M2 to SAR at M1 = 67.6%

Maximum value of SAR (measured) = 2.86 W/kg



0 dB = 2.86 W/kg = 4.57 dBW/kg

Date: 2020/11/4

Report No. : E5/2020/A0002
Dipole 1750 MHz_SN:1008

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

Medium parameters used: f = 1750 MHz; σ = 1.363 S/m; ε_r = 40.247; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.94, 8.94, 8.94); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (51x81x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 13.3 W/kg

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

Reference Value = 102.5 V/m; Power Drift = -0.01 dB

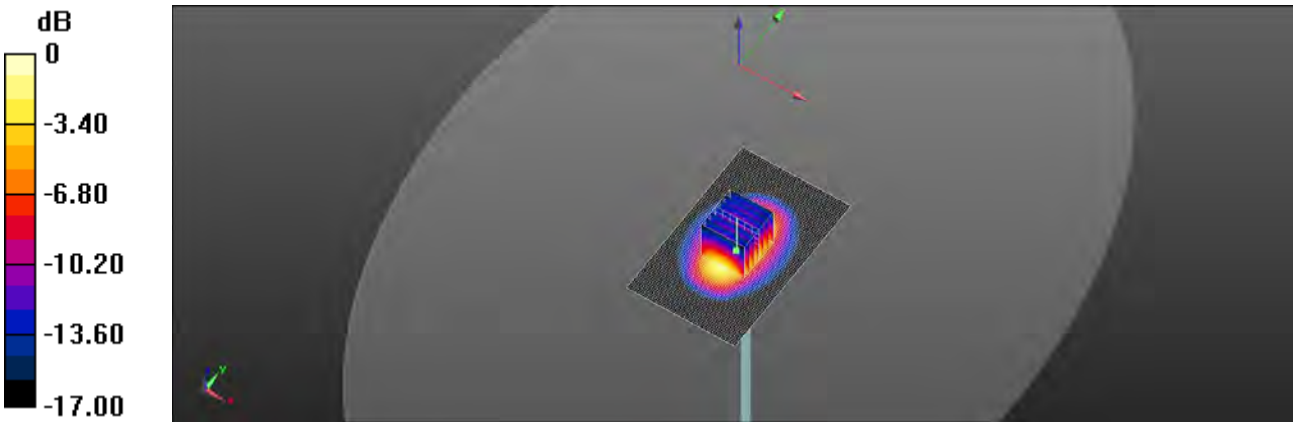
Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 9.08 W/kg; SAR(10 g) = 4.75 W/kg

Smallest distance from peaks to all points 3 dB below = 8.8 mm

Ratio of SAR at M2 to SAR at M1 = 55.2%

Maximum value of SAR (measured) = 13.0 W/kg



0 dB = 13.0 W/kg = 11.15 dBW/kg

Date: 2020/11/4

Report No. : E5/2020/A0002
Dipole 1900 MHz_SN:5d173

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

Medium parameters used: f = 1900 MHz; σ = 1.395 S/m; ε_r = 40.168; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.56, 8.56, 8.56); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (51x91x1): Interpolated grid: dx=15 mm, dy=15 mm

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

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

Reference Value = 107.8 V/m; Power Drift = -0.01 dB

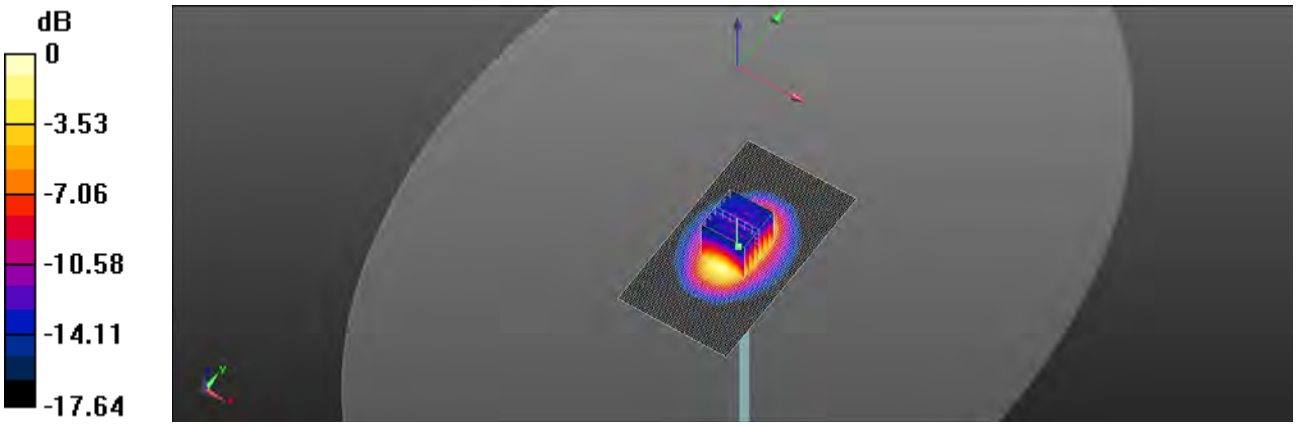
Peak SAR (extrapolated) = 17.4 W/kg

SAR(1 g) = 9.72 W/kg; SAR(10 g) = 5.19 W/kg

Smallest distance from peaks to all points 3 dB below = 8.3 mm

Ratio of SAR at M2 to SAR at M1 = 54.4%

Maximum value of SAR (measured) = 13.5 W/kg



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

Date: 2020/11/5

Report No. : E5/2020/A0002

Dipole 2300 MHz_SN:1023

Communication System: CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2300 MHz; σ = 1.649 S/m; ε_r = 39.096; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.9°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(8.08, 8.08, 8.08); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 19.4 W/kg

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

Reference Value = 104.2 V/m; Power Drift = -0.03 dB

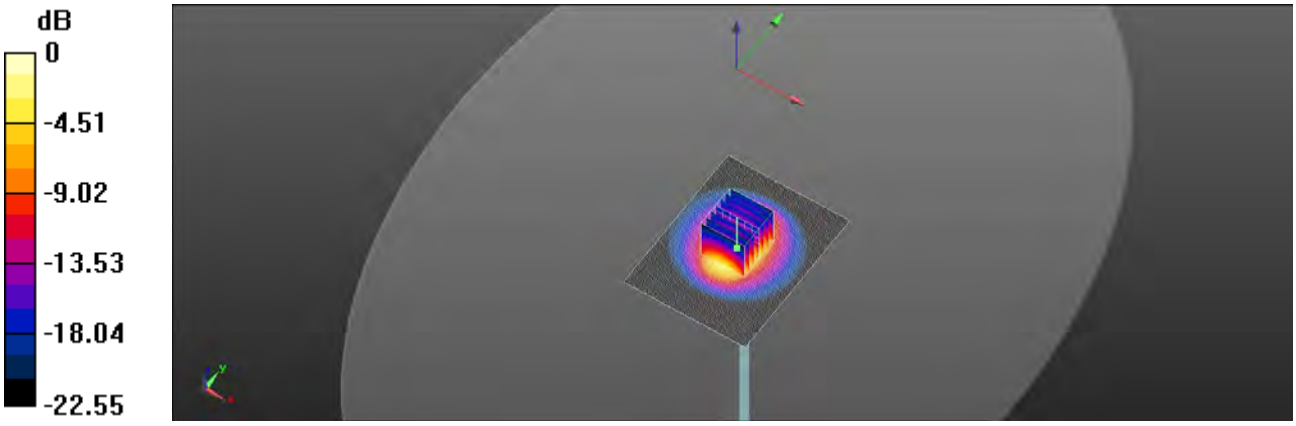
Peak SAR (extrapolated) = 25.7 W/kg

SAR(1 g) = 12.2 W/kg; SAR(10 g) = 5.84 W/kg

Smallest distance from peaks to all points 3 dB below = 9.5 mm

Ratio of SAR at M2 to SAR at M1 = 57.6%

Maximum value of SAR (measured) = 18.7 W/kg



0 dB = 18.7 W/kg = 12.73 dBW/kg

Date: 2020/11/6

Report No. : E5/2020/A0002

Dipole 2600 MHz_SN:1005

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium parameters used: f = 2600 MHz; σ = 1.945 S/m; ε_r = 38.646; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7466; ConvF(7.53, 7.53, 7.53); Calibrated: 2020/2/4
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2020/8/13
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (71x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 24.4 W/kg

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

Reference Value = 106.9 V/m; Power Drift = -0.02 dB

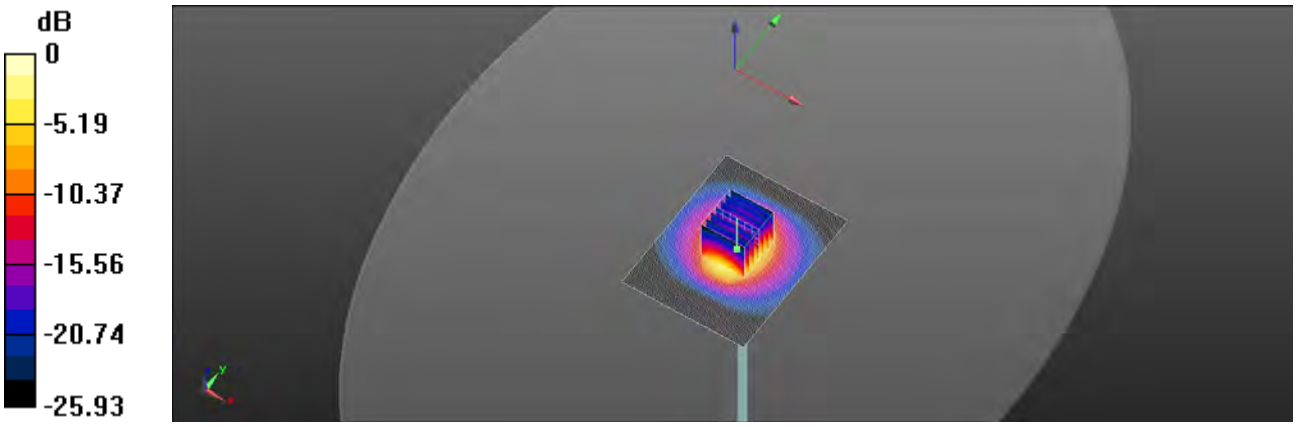
Peak SAR (extrapolated) = 33.8 W/kg

SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.31 W/kg

Smallest distance from peaks to all points 3 dB below = 9.8 mm

Ratio of SAR at M2 to SAR at M1 = 62.8%

Maximum value of SAR (measured) = 23.5 W/kg



0 dB = 23.5 W/kg = 13.72 dBW/kg

6. Uncertainty Budget

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

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	0.95%	N	1	1	0.64	0.43	0.61%	0.41%	M
Liquid Conductivity (mea.)	1.06%	N	1	1	0.6	0.49	0.64%	0.52%	M
Combined standard uncertainty		RSS					11.45%	11.43%	
Expant uncertainty (95% confidence							22.90%	22.85%	

Appendixes

Refer to separated files for the following appendixes.

E52020A0002 SAR_Appendix A Photographs

E52020A0002 SAR_Appendix B DAE & Probe Cal. Certificate

E52020A0002 SAR_Appendix C Phantom Description & Dipole Cal. Certificate

- End of report -