

SAR TEST REPORT



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

Equipment Under Test Electrified Bike SECTION A SUB-ASSY
Brand Name Vanmoof
Model No. VM13-144
Company Name VanMoof Asia Ltd.
Company Address No. 9, Lane 71, Section 1, Hangzhou South Road,
Zhongzheng District, Taipei City, 100
Standards IEEE/ANSI C95.1-1992, IEEE 1528-2013,
FCC ID 2AWDQ-VM-ES3-SEC-A
Date of Receipt Jul. 02, 2020
Date of Test(s) Dec. 05, 2020 ~ Dec. 07, 2020
Date of Issue Feb. 04, 2021

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 / Annie Chang	Engineer / Jay Tseng	Asst. Manager / John Yeh

Date: Feb. 04, 2021

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Revision History

Report Number	Revision	Description	Issue Date
ES/2020/70001	Rev.00	Initial creation of document	Feb. 04, 2021

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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

KDB865664D01v01r04

KDB865664D02v01r02

KDB941225D01v03r01

KDB447498D01v06

KDB941225D05v02r05

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1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Central RF Lab	
No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan	
FCC Designation Number	TW0027
Tel	+886-2-2299-3279
Fax	+886-2-2298-0488
Internet	http://www.tw.sgs.com/

1.2 Details of Applicant

Company Name	VanMoof Asia Ltd.
Company Address	No. 9, Lane 71, Section 1, Hangzhou South Road, Zhongzheng District, Taipei City, 100

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1.3 Description of EUT

Equipment Under Test	Electrified Bike SECTION A SUB-ASSY			
Brand Name	Vanmoof			
Model No.	VM13-144			
FCC ID	2AWDQ-VM-ES3-SEC-A			
Mode of Operation	<input checked="" type="checkbox"/> WCDMA <input checked="" type="checkbox"/> HSDPA <input checked="" type="checkbox"/> HSUPA <input checked="" type="checkbox"/> LTE FDD <input checked="" type="checkbox"/> Bluetooth			
Duty Cycle	WCDMA	1		
	LTE FDD	1		
TX Frequency Range (MHz)	WCDMA Band II	1850	—	1910
	WCDMA Band V	824	—	849
	LTE FDD Band 2	1850	—	1910
	LTE FDD Band 4	1710	—	1755
	LTE FDD Band 5	824	—	849
	LTE FDD Band 12	699	—	716
	Bluetooth	2402	—	2480
Channel Number (ARFCN)	WCDMA Band II	9262	—	9538
	WCDMA Band V	4132	—	4233
	LTE FDD Band 2	18607	—	19193
	LTE FDD Band 4	19957	—	20393
	LTE FDD Band 5	20407	—	20643
	LTE FDD Band 12	23017	—	23173
	Bluetooth	0	—	78

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Max. SAR (1 g) (Unit: W/Kg)				
Band	Measured	Reported	Channel	Position
WCDMA Band II	0.83	1.02	9538	Top side
WCDMA Band V	0.46	0.77	4233	Top side
LTE FDD Band 2	0.87	0.89	18700	Top side
LTE FDD Band 4	0.61	0.67	20050	Top side
LTE FDD Band 5	0.75	0.85	20525	Top side
LTE FDD Band 12	0.87	0.96	23060	Top side

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WCDMA Band II / 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)		25.00		
3GPP Rel 99	RMC 12.2Kbps	23.10	23.05	23.11
3GPP Rel 5	HSDPA Subtest-1	23.03	22.99	22.99
	HSDPA Subtest-2	22.89	22.84	22.95
	HSDPA Subtest-3	22.88	22.97	22.85
	HSDPA Subtest-4	22.96	22.85	22.87
3GPP Rel 6	HSUPA Subtest-1	22.91	22.89	22.81
	HSUPA Subtest-2	22.72	22.76	22.75
	HSUPA Subtest-3	22.87	22.79	22.77
	HSUPA Subtest-4	22.73	22.79	22.69
	HSUPA Subtest-5	22.91	22.89	22.81

Band		WCDMA V		
TX Channel		4132	4183	4233
Frequency (MHz)		826.4	836.6	846.6
Max. Rated Avg. Power+Max. Tolerance (dBm)		25.00		
3GPP Rel 99	RMC 12.2Kbps	23.13	23.11	23.27
3GPP Rel 5	HSDPA Subtest-1	23.02	23.08	23.17
	HSDPA Subtest-2	22.96	22.99	23.04
	HSDPA Subtest-3	22.92	22.95	23.01
	HSDPA Subtest-4	22.83	22.89	22.97
3GPP Rel 6	HSUPA Subtest-1	23.00	23.09	23.14
	HSUPA Subtest-2	22.92	23.00	22.97
	HSUPA Subtest-3	22.92	22.95	22.88
	HSUPA Subtest-4	22.97	22.86	22.84
	HSUPA Subtest-5	22.94	22.82	22.87

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Subtests for WCDMA Release 5 HSDPA

SUB-TEST	β_c	β_d	β_d (SF)	β_o/β_d	β_{HS} (Note 1, 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

Subtests for WCDMA Release 6 HSUPA

SUB-TEST	β_c	β_d	β_d (SF)	β_o/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	15/15	64	15/15	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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LTE FDD Band 2 / Band 4 / Band 5 / Band 12 conducted power table:

FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	QPSK	1 RB	0	1860	18700	22.34	23.00	0
				1880	18900	22.29	23.00	0
				1900	19100	22.45	23.00	0
			50	1860	18700	22.39	23.00	0
				1880	18900	22.42	23.00	0
				1900	19100	22.46	23.00	0
			99	1860	18700	22.93	23.00	0
				1880	18900	22.91	23.00	0
				1900	19100	22.84	23.00	0
		50 RB	0	1860	18700	21.51	22.00	0-1
				1880	18900	21.36	22.00	0-1
				1900	19100	21.52	22.00	0-1
			25	1860	18700	21.48	22.00	0-1
				1880	18900	21.37	22.00	0-1
				1900	19100	21.51	22.00	0-1
			50	1860	18700	21.49	22.00	0-1
				1880	18900	21.36	22.00	0-1
				1900	19100	21.53	22.00	0-1
		100RB		1860	18700	21.19	22.00	0-1
				1880	18900	20.92	22.00	0-1
				1900	19100	21.21	22.00	0-1
	16-QAM	1 RB	0	1860	18700	21.61	22.00	0-1
				1880	18900	20.66	22.00	0-1
				1900	19100	21.77	22.00	0-1
			50	1860	18700	21.46	22.00	0-1
				1880	18900	21.35	22.00	0-1
				1900	19100	21.48	22.00	0-1
			99	1860	18700	21.42	22.00	0-1
				1880	18900	21.52	22.00	0-1
				1900	19100	21.05	22.00	0-1
		50 RB	0	1860	18700	20.38	21.00	0-2
				1880	18900	20.51	21.00	0-2
				1900	19100	20.47	21.00	0-2
			25	1860	18700	20.52	21.00	0-2
				1880	18900	20.35	21.00	0-2
				1900	19100	20.48	21.00	0-2
			50	1860	18700	20.45	21.00	0-2
				1880	18900	20.42	21.00	0-2
				1900	19100	20.39	21.00	0-2
		100RB		1860	18700	20.21	21.00	0-2
				1880	18900	20.43	21.00	0-2
				1900	19100	20.24	21.00	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
20	64-QAM	1 RB	0	1860	18700	20.33	21.00	0-2
				1880	18900	20.94	21.00	0-2
				1900	19100	20.98	21.00	0-2
			50	1860	18700	20.46	21.00	0-2
				1880	18900	20.41	21.00	0-2
				1900	19100	20.46	21.00	0-2
			99	1860	18700	20.49	21.00	0-2
				1880	18900	20.42	21.00	0-2
				1900	19100	20.51	21.00	0-2
		50 RB	0	1860	18700	19.39	20.00	0-3
				1880	18900	19.53	20.00	0-3
				1900	19100	19.36	20.00	0-3
			25	1860	18700	19.53	20.00	0-3
				1880	18900	19.48	20.00	0-3
				1900	19100	19.45	20.00	0-3
			50	1860	18700	19.53	20.00	0-3
				1880	18900	19.50	20.00	0-3
				1900	19100	19.50	20.00	0-3
		100RB		1860	18700	19.53	20.00	0-3
				1880	18900	19.34	20.00	0-3
				1900	19100	19.43	20.00	0-3

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	1857.5	18675	21.84	23.00	0
				1880	18900	22.44	23.00	0
				1902.5	19125	22.57	23.00	0
			36	1857.5	18675	22.34	23.00	0
				1880	18900	22.42	23.00	0
				1902.5	19125	22.41	23.00	0
		74	0	1857.5	18675	22.51	23.00	0
				1880	18900	22.52	23.00	0
				1902.5	19125	22.48	23.00	0
			18	1857.5	18675	21.43	22.00	0-1
				1880	18900	21.52	22.00	0-1
				1902.5	19125	21.46	22.00	0-1
		37	0	1857.5	18675	21.42	22.00	0-1
				1880	18900	21.47	22.00	0-1
				1902.5	19125	21.47	22.00	0-1
			18	1857.5	18675	21.45	22.00	0-1
				1880	18900	21.44	22.00	0-1
				1902.5	19125	21.38	22.00	0-1
		75RB	0	1857.5	18675	21.36	22.00	0-1
				1880	18900	21.48	22.00	0-1
				1902.5	19125	21.44	22.00	0-1
	16-QAM	1 RB	0	1857.5	18675	21.37	22.00	0-1
				1880	18900	21.39	22.00	0-1
				1902.5	19125	21.44	22.00	0-1
			36	1857.5	18675	21.42	22.00	0-1
				1880	18900	21.46	22.00	0-1
				1902.5	19125	21.52	22.00	0-1
		74	0	1857.5	18675	21.51	22.00	0-1
				1880	18900	21.43	22.00	0-1
				1902.5	19125	21.47	22.00	0-1
		36 RB	0	1857.5	18675	20.38	21.00	0-2
				1880	18900	20.46	21.00	0-2
				1902.5	19125	20.53	21.00	0-2
			18	1857.5	18675	20.37	21.00	0-2
				1880	18900	20.45	21.00	0-2
				1902.5	19125	20.52	21.00	0-2
		37	0	1857.5	18675	20.42	21.00	0-2
				1880	18900	20.47	21.00	0-2
				1902.5	19125	20.34	21.00	0-2
		75RB	0	1857.5	18675	20.42	21.00	0-2
				1880	18900	20.44	21.00	0-2
				1902.5	19125	20.53	21.00	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	64-QAM	1 RB	0	1857.5	18675	20.40	21.00	0-2
				1880	18900	20.52	21.00	0-2
				1902.5	19125	20.43	21.00	0-2
			36	1857.5	18675	20.52	21.00	0-2
				1880	18900	20.36	21.00	0-2
				1902.5	19125	20.47	21.00	0-2
			74	1857.5	18675	20.37	21.00	0-2
				1880	18900	20.50	21.00	0-2
				1902.5	19125	20.39	21.00	0-2
		36 RB	0	1857.5	18675	19.52	20.00	0-3
				1880	18900	19.36	20.00	0-3
				1902.5	19125	19.39	20.00	0-3
			18	1857.5	18675	19.41	20.00	0-3
				1880	18900	19.41	20.00	0-3
				1902.5	19125	19.40	20.00	0-3
			37	1857.5	18675	19.53	20.00	0-3
				1880	18900	19.42	20.00	0-3
				1902.5	19125	19.44	20.00	0-3
		75RB		1857.5	18675	19.49	20.00	0-3
				1880	18900	19.47	20.00	0-3
				1902.5	19125	19.48	20.00	0-3

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FDD Band 2									
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)	
10	QPSK	1 RB	0	1855	18650	21.66	23.00	0	
				1880	18900	22.04	23.00	0	
				1905	19150	22.01	23.00	0	
			25	1855	18650	22.43	23.00	0	
				1880	18900	22.36	23.00	0	
				1905	19150	22.50	23.00	0	
			49	1855	18650	22.45	23.00	0	
				1880	18900	22.46	23.00	0	
				1905	19150	22.52	23.00	0	
		25 RB	0	1855	18650	21.35	22.00	0-1	
				1880	18900	21.36	22.00	0-1	
				1905	19150	21.47	22.00	0-1	
			12	1855	18650	21.47	22.00	0-1	
				1880	18900	21.49	22.00	0-1	
				1905	19150	21.44	22.00	0-1	
			25	1855	18650	21.50	22.00	0-1	
				1880	18900	21.48	22.00	0-1	
				1905	19150	21.40	22.00	0-1	
		50RB			1855	18650	21.49	22.00	0-1
					1880	18900	21.51	22.00	0-1
					1905	19150	21.47	22.00	0-1
	16-QAM	1 RB	0	1855	18650	21.47	22.00	0-1	
				1880	18900	21.36	22.00	0-1	
				1905	19150	21.38	22.00	0-1	
			25	1855	18650	21.47	22.00	0-1	
				1880	18900	21.50	22.00	0-1	
				1905	19150	21.47	22.00	0-1	
			49	1855	18650	21.39	22.00	0-1	
				1880	18900	21.44	22.00	0-1	
				1905	19150	21.41	22.00	0-1	
			25 RB	0	1855	18650	20.35	21.00	0-2
					1880	18900	20.44	21.00	0-2
					1905	19150	20.52	21.00	0-2
				12	1855	18650	20.35	21.00	0-2
					1880	18900	20.48	21.00	0-2
					1905	19150	20.48	21.00	0-2
			25	1855	18650	20.37	21.00	0-2	
				1880	18900	20.46	21.00	0-2	
				1905	19150	20.37	21.00	0-2	
		50RB			1855	18650	20.36	21.00	0-2
					1880	18900	20.37	21.00	0-2
					1905	19150	20.36	21.00	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	64-QAM	1 RB	0	1855	18650	20.36	21.00	0-2
				1880	18900	20.37	21.00	0-2
				1905	19150	20.50	21.00	0-2
			25	1855	18650	20.48	21.00	0-2
				1880	18900	20.53	21.00	0-2
				1905	19150	20.51	21.00	0-2
			49	1855	18650	20.41	21.00	0-2
				1880	18900	20.42	21.00	0-2
				1905	19150	20.42	21.00	0-2
		25 RB	0	1855	18650	19.35	20.00	0-3
				1880	18900	19.36	20.00	0-3
				1905	19150	19.53	20.00	0-3
			12	1855	18650	19.48	20.00	0-3
				1880	18900	19.47	20.00	0-3
				1905	19150	19.43	20.00	0-3
			25	1855	18650	19.38	20.00	0-3
				1880	18900	19.38	20.00	0-3
				1905	19150	19.40	20.00	0-3
		50RB		1855	18650	19.47	20.00	0-3
				1880	18900	19.50	20.00	0-3
				1905	19150	19.38	20.00	0-3

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	1852.5	18625	22.38	23.00	0
				1880	18900	22.44	23.00	0
				1907.5	19175	22.36	23.00	0
			12	1852.5	18625	22.50	23.00	0
				1880	18900	22.40	23.00	0
				1907.5	19175	22.34	23.00	0
			24	1852.5	18625	22.36	23.00	0
				1880	18900	22.39	23.00	0
				1907.5	19175	22.40	23.00	0
		12 RB	0	1852.5	18625	21.37	22.00	0-1
				1880	18900	21.52	22.00	0-1
				1907.5	19175	21.39	22.00	0-1
			6	1852.5	18625	21.46	22.00	0-1
				1880	18900	21.48	22.00	0-1
				1907.5	19175	21.48	22.00	0-1
			13	1852.5	18625	21.46	22.00	0-1
				1880	18900	21.50	22.00	0-1
				1907.5	19175	21.47	22.00	0-1
		25RB		1852.5	18625	21.44	22.00	0-1
				1880	18900	21.42	22.00	0-1
				1907.5	19175	21.43	22.00	0-1
	16-QAM	1 RB	0	1852.5	18625	21.48	22.00	0-1
				1880	18900	21.53	22.00	0-1
				1907.5	19175	21.53	22.00	0-1
			12	1852.5	18625	21.38	22.00	0-1
				1880	18900	21.53	22.00	0-1
				1907.5	19175	21.37	22.00	0-1
			24	1852.5	18625	21.47	22.00	0-1
				1880	18900	21.47	22.00	0-1
				1907.5	19175	21.47	22.00	0-1
		12 RB	0	1852.5	18625	20.53	21.00	0-2
				1880	18900	20.45	21.00	0-2
				1907.5	19175	20.43	21.00	0-2
			6	1852.5	18625	20.51	21.00	0-2
				1880	18900	20.41	21.00	0-2
				1907.5	19175	20.40	21.00	0-2
			13	1852.5	18625	20.49	21.00	0-2
				1880	18900	20.44	21.00	0-2
				1907.5	19175	20.42	21.00	0-2
		25RB		1852.5	18625	20.41	21.00	0-2
				1880	18900	20.41	21.00	0-2
				1907.5	19175	20.36	21.00	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	64-QAM	1 RB	0	1852.5	18625	20.40	21.00	0-2
				1880	18900	20.43	21.00	0-2
				1907.5	19175	20.40	21.00	0-2
			12	1852.5	18625	20.41	21.00	0-2
				1880	18900	20.37	21.00	0-2
				1907.5	19175	20.45	21.00	0-2
			24	1852.5	18625	20.43	21.00	0-2
				1880	18900	20.43	21.00	0-2
				1907.5	19175	20.47	21.00	0-2
		12 RB	0	1852.5	18625	19.48	20.00	0-3
				1880	18900	19.43	20.00	0-3
				1907.5	19175	19.47	20.00	0-3
			6	1852.5	18625	19.50	20.00	0-3
				1880	18900	19.53	20.00	0-3
				1907.5	19175	19.40	20.00	0-3
			13	1852.5	18625	19.37	20.00	0-3
				1880	18900	19.39	20.00	0-3
				1907.5	19175	19.46	20.00	0-3
		25RB		1852.5	18625	19.49	20.00	0-3
				1880	18900	19.38	20.00	0-3
				1907.5	19175	19.43	20.00	0-3

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	1851.5	18615	22.45	23.00	0
				1880	18900	22.52	23.00	0
				1908.5	19185	22.36	23.00	0
			7	1851.5	18615	22.53	23.00	0
				1880	18900	22.34	23.00	0
				1908.5	19185	22.47	23.00	0
			14	1851.5	18615	22.43	23.00	0
				1880	18900	22.40	23.00	0
				1908.5	19185	22.43	23.00	0
		8 RB	0	1851.5	18615	21.39	22.00	0-1
				1880	18900	21.52	22.00	0-1
				1908.5	19185	21.40	22.00	0-1
			4	1851.5	18615	21.38	22.00	0-1
				1880	18900	21.37	22.00	0-1
				1908.5	19185	21.47	22.00	0-1
			7	1851.5	18615	21.37	22.00	0-1
				1880	18900	21.51	22.00	0-1
				1908.5	19185	21.34	22.00	0-1
		15RB		1851.5	18615	21.41	22.00	0-1
				1880	18900	21.53	22.00	0-1
				1908.5	19185	21.43	22.00	0-1
	16-QAM	1 RB	0	1851.5	18615	21.46	22.00	0-1
				1880	18900	21.50	22.00	0-1
				1908.5	19185	21.49	22.00	0-1
			7	1851.5	18615	21.44	22.00	0-1
				1880	18900	21.41	22.00	0-1
				1908.5	19185	21.53	22.00	0-1
			14	1851.5	18615	21.47	22.00	0-1
				1880	18900	21.35	22.00	0-1
				1908.5	19185	21.40	22.00	0-1
		8 RB	0	1851.5	18615	20.40	21.00	0-2
				1880	18900	20.45	21.00	0-2
				1908.5	19185	20.49	21.00	0-2
			4	1851.5	18615	20.52	21.00	0-2
				1880	18900	20.36	21.00	0-2
				1908.5	19185	20.49	21.00	0-2
			7	1851.5	18615	20.43	21.00	0-2
				1880	18900	20.40	21.00	0-2
				1908.5	19185	20.44	21.00	0-2
		15RB		1851.5	18615	20.40	21.00	0-2
				1880	18900	20.50	21.00	0-2
				1908.5	19185	20.49	21.00	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	64-QAM	1 RB	0	1851.5	18615	20.34	21.00	0-2
				1880	18900	20.41	21.00	0-2
				1908.5	19185	20.42	21.00	0-2
			7	1851.5	18615	20.48	21.00	0-2
				1880	18900	20.51	21.00	0-2
				1908.5	19185	20.51	21.00	0-2
			14	1851.5	18615	20.43	21.00	0-2
				1880	18900	20.37	21.00	0-2
				1908.5	19185	20.40	21.00	0-2
		8 RB	0	1851.5	18615	19.46	20.00	0-3
				1880	18900	19.49	20.00	0-3
				1908.5	19185	19.34	20.00	0-3
			4	1851.5	18615	19.44	20.00	0-3
				1880	18900	19.47	20.00	0-3
				1908.5	19185	19.51	20.00	0-3
			7	1851.5	18615	19.43	20.00	0-3
				1880	18900	19.40	20.00	0-3
				1908.5	19185	19.42	20.00	0-3
		15RB		1851.5	18615	19.47	20.00	0-3
				1880	18900	19.53	20.00	0-3
				1908.5	19185	19.35	20.00	0-3

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	1850.7	18607	22.37	23.00	0
				1880	18900	22.43	23.00	0
				1909.3	19193	22.39	23.00	0
			2	1850.7	18607	22.52	23.00	0
				1880	18900	22.44	23.00	0
				1909.3	19193	22.38	23.00	0
			5	1850.7	18607	22.39	23.00	0
				1880	18900	22.53	23.00	0
				1909.3	19193	22.49	23.00	0
		3 RB	0	1850.7	18607	21.38	22.00	0-1
				1880	18900	21.42	22.00	0-1
				1909.3	19193	21.49	22.00	0-1
			2	1850.7	18607	21.49	22.00	0-1
				1880	18900	21.51	22.00	0-1
				1909.3	19193	21.43	22.00	0-1
			3	1850.7	18607	21.43	22.00	0-1
				1880	18900	21.34	22.00	0-1
				1909.3	19193	21.35	22.00	0-1
		6RB		1850.7	18607	21.41	22.00	0-1
				1880	18900	21.53	22.00	0-1
				1909.3	19193	21.44	22.00	0-1
	16-QAM	1 RB	0	1850.7	18607	21.51	22.00	0-1
				1880	18900	21.46	22.00	0-1
				1909.3	19193	21.48	22.00	0-1
			2	1850.7	18607	21.35	22.00	0-1
				1880	18900	21.50	22.00	0-1
				1909.3	19193	21.36	22.00	0-1
			5	1850.7	18607	21.41	22.00	0-1
				1880	18900	21.51	22.00	0-1
				1909.3	19193	21.51	22.00	0-1
		3 RB	0	1850.7	18607	20.34	21.00	0-2
				1880	18900	20.51	21.00	0-2
				1909.3	19193	20.52	21.00	0-2
			2	1850.7	18607	20.51	21.00	0-2
				1880	18900	20.38	21.00	0-2
				1909.3	19193	20.37	21.00	0-2
			3	1850.7	18607	20.44	21.00	0-2
				1880	18900	20.40	21.00	0-2
				1909.3	19193	20.41	21.00	0-2
		6RB		1850.7	18607	20.47	21.00	0-2
				1880	18900	20.42	21.00	0-2
				1909.3	19193	20.48	21.00	0-2

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FDD Band 2								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	64-QAM	1 RB	0	1850.7	18607	20.53	21.00	0-2
				1880	18900	20.41	21.00	0-2
				1909.3	19193	20.51	21.00	0-2
			2	1850.7	18607	20.42	21.00	0-2
				1880	18900	20.53	21.00	0-2
				1909.3	19193	20.34	21.00	0-2
			5	1850.7	18607	20.40	21.00	0-2
				1880	18900	20.45	21.00	0-2
				1909.3	19193	20.36	21.00	0-2
		3 RB	0	1850.7	18607	19.43	20.00	0-3
				1880	18900	19.41	20.00	0-3
				1909.3	19193	19.49	20.00	0-3
			2	1850.7	18607	19.40	20.00	0-3
				1880	18900	19.38	20.00	0-3
				1909.3	19193	19.37	20.00	0-3
			3	1850.7	18607	19.44	20.00	0-3
				1880	18900	19.41	20.00	0-3
				1909.3	19193	19.49	20.00	0-3
		6RB		1850.7	18607	19.39	20.00	0-3
				1880	18900	19.51	20.00	0-3
				1909.3	19193	19.44	20.00	0-3

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
20	QPSK	1 RB	0	1720	20050	22.54	23.00	0
				1732.5	20175	22.22	23.00	0
				1745	20300	22.20	23.00	0
			50	1720	20050	22.26	23.00	0
				1732.5	20175	22.16	23.00	0
				1745	20300	22.27	23.00	0
			99	1720	20050	22.41	23.00	0
				1732.5	20175	21.65	23.00	0
				1745	20300	21.77	23.00	0
		50 RB	0	1720	20050	21.33	22.00	0-1
				1732.5	20175	21.34	22.00	0-1
				1745	20300	21.36	22.00	0-1
			25	1720	20050	21.31	22.00	0-1
				1732.5	20175	21.32	22.00	0-1
				1745	20300	21.14	22.00	0-1
			50	1720	20050	21.25	22.00	0-1
				1732.5	20175	21.33	22.00	0-1
				1745	20300	21.17	22.00	0-1
		100RB		1720	20050	21.30	22.00	0-1
				1732.5	20175	21.27	22.00	0-1
				1745	20300	21.33	22.00	0-1
	16-QAM	1 RB	0	1720	20050	21.63	22.00	0-1
				1732.5	20175	21.56	22.00	0-1
				1745	20300	21.60	22.00	0-1
			50	1720	20050	21.27	22.00	0-1
				1732.5	20175	21.19	22.00	0-1
				1745	20300	21.31	22.00	0-1
			99	1720	20050	21.33	22.00	0-1
				1732.5	20175	21.27	22.00	0-1
				1745	20300	21.29	22.00	0-1
		50 RB	0	1720	20050	20.17	21.00	0-2
				1732.5	20175	20.25	21.00	0-2
				1745	20300	20.25	21.00	0-2
			25	1720	20050	20.18	21.00	0-2
				1732.5	20175	20.19	21.00	0-2
				1745	20300	20.23	21.00	0-2
			50	1720	20050	20.31	21.00	0-2
				1732.5	20175	20.25	21.00	0-2
				1745	20300	20.32	21.00	0-2
		100RB		1720	20050	20.29	21.00	0-2
				1732.5	20175	20.20	21.00	0-2
				1745	20300	20.05	21.00	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
20	64-QAM	1 RB	0	1720	20050	20.82	21.00	0-2
				1732.5	20175	20.85	21.00	0-2
				1745	20300	20.97	21.00	0-2
			50	1720	20050	20.15	21.00	0-2
				1732.5	20175	20.27	21.00	0-2
				1745	20300	20.33	21.00	0-2
			99	1720	20050	20.20	21.00	0-2
				1732.5	20175	20.28	21.00	0-2
				1745	20300	20.29	21.00	0-2
		50 RB	0	1720	20050	19.23	20.00	0-3
				1732.5	20175	19.17	20.00	0-3
				1745	20300	19.31	20.00	0-3
			25	1720	20050	19.31	20.00	0-3
				1732.5	20175	19.16	20.00	0-3
				1745	20300	19.32	20.00	0-3
			50	1720	20050	19.27	20.00	0-3
				1732.5	20175	19.26	20.00	0-3
				1745	20300	19.33	20.00	0-3
		100RB		1720	20050	19.18	20.00	0-3
				1732.5	20175	19.19	20.00	0-3
				1745	20300	19.15	20.00	0-3

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
15	QPSK	1 RB	0	1717.5	20025	22.23	23.00	0
				1732.5	20175	22.15	23.00	0
				1747.5	20325	22.21	23.00	0
			36	1717.5	20025	22.22	23.00	0
				1732.5	20175	22.20	23.00	0
				1747.5	20325	22.21	23.00	0
			74	1717.5	20025	21.79	23.00	0
				1732.5	20175	21.72	23.00	0
				1747.5	20325	21.88	23.00	0
		36 RB	0	1717.5	20025	21.14	22.00	0-1
				1732.5	20175	21.15	22.00	0-1
				1747.5	20325	21.18	22.00	0-1
			18	1717.5	20025	21.22	22.00	0-1
				1732.5	20175	21.30	22.00	0-1
				1747.5	20325	21.16	22.00	0-1
			37	1717.5	20025	21.22	22.00	0-1
				1732.5	20175	21.18	22.00	0-1
				1747.5	20325	21.33	22.00	0-1
		75RB		1717.5	20025	21.22	22.00	0-1
				1732.5	20175	21.18	22.00	0-1
				1747.5	20325	21.24	22.00	0-1
	16-QAM	1 RB	0	1717.5	20025	21.22	22.00	0-1
				1732.5	20175	21.16	22.00	0-1
				1747.5	20325	21.14	22.00	0-1
			36	1717.5	20025	21.27	22.00	0-1
				1732.5	20175	21.28	22.00	0-1
				1747.5	20325	21.20	22.00	0-1
			74	1717.5	20025	21.19	22.00	0-1
				1732.5	20175	21.26	22.00	0-1
				1747.5	20325	21.17	22.00	0-1
		36 RB	0	1717.5	20025	20.21	21.00	0-2
				1732.5	20175	20.33	21.00	0-2
				1747.5	20325	20.29	21.00	0-2
			18	1717.5	20025	20.14	21.00	0-2
				1732.5	20175	20.25	21.00	0-2
				1747.5	20325	20.16	21.00	0-2
			37	1717.5	20025	20.29	21.00	0-2
				1732.5	20175	20.30	21.00	0-2
				1747.5	20325	20.19	21.00	0-2
		75RB		1717.5	20025	20.18	21.00	0-2
				1732.5	20175	20.23	21.00	0-2
				1747.5	20325	20.25	21.00	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
15	64-QAM	1 RB	0	1717.5	20025	20.25	21.00	0-2
				1732.5	20175	20.02	21.00	0-2
				1747.5	20325	20.23	21.00	0-2
			36	1717.5	20025	20.32	21.00	0-2
				1732.5	20175	20.32	21.00	0-2
				1747.5	20325	20.23	21.00	0-2
			74	1717.5	20025	20.17	21.00	0-2
				1732.5	20175	20.29	21.00	0-2
				1747.5	20325	20.19	21.00	0-2
		36 RB	0	1717.5	20025	19.22	20.00	0-3
				1732.5	20175	19.21	20.00	0-3
				1747.5	20325	19.23	20.00	0-3
			18	1717.5	20025	19.27	20.00	0-3
				1732.5	20175	19.16	20.00	0-3
				1747.5	20325	19.14	20.00	0-3
			37	1717.5	20025	19.28	20.00	0-3
				1732.5	20175	19.14	20.00	0-3
				1747.5	20325	19.18	20.00	0-3
		75RB		1717.5	20025	19.26	20.00	0-3
				1732.5	20175	19.15	20.00	0-3
				1747.5	20325	19.30	20.00	0-3

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	1715	20000	21.15	23.00	0
				1732.5	20175	21.08	23.00	0
				1750	20350	21.42	23.00	0
			25	1715	20000	22.16	23.00	0
				1732.5	20175	22.27	23.00	0
				1750	20350	22.15	23.00	0
			49	1715	20000	21.75	23.00	0
				1732.5	20175	21.76	23.00	0
				1750	20350	21.29	23.00	0
		25 RB	0	1715	20000	21.17	22.00	0-1
				1732.5	20175	21.26	22.00	0-1
				1750	20350	21.25	22.00	0-1
			12	1715	20000	21.19	22.00	0-1
				1732.5	20175	21.17	22.00	0-1
				1750	20350	21.26	22.00	0-1
			25	1715	20000	21.23	22.00	0-1
				1732.5	20175	21.33	22.00	0-1
				1750	20350	21.14	22.00	0-1
		50RB		1715	20000	21.21	22.00	0-1
				1732.5	20175	21.26	22.00	0-1
				1750	20350	21.16	22.00	0-1
	16-QAM	1 RB	0	1715	20000	20.46	22.00	0-1
				1732.5	20175	20.38	22.00	0-1
				1750	20350	20.67	22.00	0-1
			25	1715	20000	21.18	22.00	0-1
				1732.5	20175	21.20	22.00	0-1
				1750	20350	21.28	22.00	0-1
			49	1715	20000	21.14	22.00	0-1
				1732.5	20175	21.30	22.00	0-1
				1750	20350	21.26	22.00	0-1
		25 RB	0	1715	20000	20.33	21.00	0-2
				1732.5	20175	20.31	21.00	0-2
				1750	20350	20.24	21.00	0-2
			12	1715	20000	20.31	21.00	0-2
				1732.5	20175	20.25	21.00	0-2
				1750	20350	20.25	21.00	0-2
			25	1715	20000	20.29	21.00	0-2
				1732.5	20175	20.19	21.00	0-2
				1750	20350	20.19	21.00	0-2
		50RB		1715	20000	20.14	21.00	0-2
				1732.5	20175	20.22	21.00	0-2
				1750	20350	20.21	21.00	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	64-QAM	1 RB	0	1715	20000	20.22	21.00	0-2
				1732.5	20175	20.27	21.00	0-2
				1750	20350	20.30	21.00	0-2
			25	1715	20000	20.28	21.00	0-2
				1732.5	20175	20.26	21.00	0-2
				1750	20350	20.19	21.00	0-2
			49	1715	20000	20.20	21.00	0-2
				1732.5	20175	20.15	21.00	0-2
				1750	20350	20.22	21.00	0-2
		25 RB	0	1715	20000	19.27	20.00	0-3
				1732.5	20175	19.30	20.00	0-3
				1750	20350	19.16	20.00	0-3
			12	1715	20000	19.28	20.00	0-3
				1732.5	20175	19.27	20.00	0-3
				1750	20350	19.25	20.00	0-3
			25	1715	20000	19.25	20.00	0-3
				1732.5	20175	19.27	20.00	0-3
				1750	20350	19.20	20.00	0-3
		50RB		1715	20000	19.18	20.00	0-3
				1732.5	20175	19.19	20.00	0-3
				1750	20350	19.27	20.00	0-3

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FDD Band 4									
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)	
5	QPSK	1 RB	0	1712.5	19975	22.14	23.00	0	
				1732.5	20175	21.80	23.00	0	
				1752.5	20375	22.31	23.00	0	
			12	1712.5	19975	22.15	23.00	0	
				1732.5	20175	22.29	23.00	0	
				1752.5	20375	22.30	23.00	0	
			24	1712.5	19975	21.47	23.00	0	
				1732.5	20175	21.69	23.00	0	
				1752.5	20375	22.03	23.00	0	
		12 RB	0	1712.5	19975	21.26	22.00	0-1	
				1732.5	20175	21.17	22.00	0-1	
				1752.5	20375	21.25	22.00	0-1	
			6	1712.5	19975	20.88	22.00	0-1	
				1732.5	20175	20.73	22.00	0-1	
				1752.5	20375	21.16	22.00	0-1	
			13	1712.5	19975	21.24	22.00	0-1	
				1732.5	20175	21.27	22.00	0-1	
				1752.5	20375	21.30	22.00	0-1	
		25RB			1712.5	19975	20.91	22.00	0-1
					1732.5	20175	20.45	22.00	0-1
					1752.5	20375	21.14	22.00	0-1
	16-QAM	1 RB	0	1712.5	19975	20.83	22.00	0-1	
				1732.5	20175	21.21	22.00	0-1	
				1752.5	20375	21.21	22.00	0-1	
			12	1712.5	19975	21.15	22.00	0-1	
				1732.5	20175	21.24	22.00	0-1	
				1752.5	20375	21.30	22.00	0-1	
			24	1712.5	19975	20.98	22.00	0-1	
				1732.5	20175	20.58	22.00	0-1	
				1752.5	20375	21.15	22.00	0-1	
			12 RB	0	1712.5	19975	20.23	21.00	0-2
					1732.5	20175	20.14	21.00	0-2
					1752.5	20375	20.21	21.00	0-2
				6	1712.5	19975	20.28	21.00	0-2
					1732.5	20175	20.32	21.00	0-2
					1752.5	20375	20.16	21.00	0-2
		13	1712.5	19975	20.17	21.00	0-2		
			1732.5	20175	20.28	21.00	0-2		
			1752.5	20375	20.32	21.00	0-2		
		25RB			1712.5	19975	20.30	21.00	0-2
					1732.5	20175	20.29	21.00	0-2
					1752.5	20375	20.19	21.00	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	64-QAM	1 RB	0	1712.5	19975	20.25	21.00	0-2
				1732.5	20175	20.22	21.00	0-2
				1752.5	20375	20.27	21.00	0-2
			12	1712.5	19975	20.24	21.00	0-2
				1732.5	20175	20.28	21.00	0-2
				1752.5	20375	20.16	21.00	0-2
			24	1712.5	19975	20.16	21.00	0-2
				1732.5	20175	20.18	21.00	0-2
				1752.5	20375	20.29	21.00	0-2
		12 RB	0	1712.5	19975	19.30	20.00	0-3
				1732.5	20175	19.32	20.00	0-3
				1752.5	20375	19.25	20.00	0-3
			6	1712.5	19975	19.25	20.00	0-3
				1732.5	20175	19.30	20.00	0-3
				1752.5	20375	19.15	20.00	0-3
			13	1712.5	19975	19.31	20.00	0-3
				1732.5	20175	19.23	20.00	0-3
				1752.5	20375	19.15	20.00	0-3
		25RB		1712.5	19975	19.22	20.00	0-3
				1732.5	20175	19.21	20.00	0-3
				1752.5	20375	19.30	20.00	0-3

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	1711.5	19965	22.04	23.00	0
				1732.5	20175	21.42	23.00	0
				1753.5	20385	22.18	23.00	0
			7	1711.5	19965	22.17	23.00	0
				1732.5	20175	22.21	23.00	0
				1753.5	20385	22.24	23.00	0
			14	1711.5	19965	21.53	23.00	0
				1732.5	20175	21.70	23.00	0
				1753.5	20385	22.04	23.00	0
		8 RB	0	1711.5	19965	21.23	22.00	0-1
				1732.5	20175	21.30	22.00	0-1
				1753.5	20385	21.30	22.00	0-1
			4	1711.5	19965	21.33	22.00	0-1
				1732.5	20175	21.29	22.00	0-1
				1753.5	20385	21.16	22.00	0-1
			7	1711.5	19965	21.33	22.00	0-1
				1732.5	20175	21.27	22.00	0-1
				1753.5	20385	21.31	22.00	0-1
		15RB		1711.5	19965	20.95	22.00	0-1
				1732.5	20175	21.84	22.00	0-1
				1753.5	20385	21.18	22.00	0-1
	16-QAM	1 RB	0	1711.5	19965	21.20	22.00	0-1
				1732.5	20175	20.61	22.00	0-1
				1753.5	20385	20.96	22.00	0-1
			7	1711.5	19965	21.28	22.00	0-1
				1732.5	20175	21.28	22.00	0-1
				1753.5	20385	21.15	22.00	0-1
			14	1711.5	19965	20.47	22.00	0-1
				1732.5	20175	20.91	22.00	0-1
				1753.5	20385	20.59	22.00	0-1
		8 RB	0	1711.5	19965	20.24	21.00	0-2
				1732.5	20175	20.32	21.00	0-2
				1753.5	20385	20.25	21.00	0-2
			4	1711.5	19965	20.14	21.00	0-2
				1732.5	20175	20.25	21.00	0-2
				1753.5	20385	20.30	21.00	0-2
			7	1711.5	19965	20.16	21.00	0-2
				1732.5	20175	20.14	21.00	0-2
				1753.5	20385	20.25	21.00	0-2
		15RB		1711.5	19965	20.31	21.00	0-2
				1732.5	20175	20.28	21.00	0-2
				1753.5	20385	20.28	21.00	0-2

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	64-QAM	1 RB	0	1711.5	19965	20.22	21.00	0-2
				1732.5	20175	20.27	21.00	0-2
				1753.5	20385	20.26	21.00	0-2
			7	1711.5	19965	20.18	21.00	0-2
				1732.5	20175	20.20	21.00	0-2
				1753.5	20385	20.17	21.00	0-2
			14	1711.5	19965	20.30	21.00	0-2
				1732.5	20175	20.30	21.00	0-2
				1753.5	20385	20.20	21.00	0-2
		8 RB	0	1711.5	19965	19.22	20.00	0-3
				1732.5	20175	19.17	20.00	0-3
				1753.5	20385	19.19	20.00	0-3
			4	1711.5	19965	19.18	20.00	0-3
				1732.5	20175	19.30	20.00	0-3
				1753.5	20385	19.19	20.00	0-3
			7	1711.5	19965	19.25	20.00	0-3
				1732.5	20175	19.28	20.00	0-3
				1753.5	20385	19.16	20.00	0-3
		15RB		1711.5	19965	19.19	20.00	0-3
				1732.5	20175	19.16	20.00	0-3
				1753.5	20385	19.31	20.00	0-3

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	1710.7	19957	21.72	23.00	0
				1732.5	20175	21.53	23.00	0
				1754.3	20393	22.23	23.00	0
			2	1710.7	19957	22.17	23.00	0
				1732.5	20175	22.21	23.00	0
				1754.3	20393	22.26	23.00	0
			5	1710.7	19957	21.71	23.00	0
				1732.5	20175	21.78	23.00	0
				1754.3	20393	22.22	23.00	0
		3 RB	0	1710.7	19957	21.22	22.00	0-1
				1732.5	20175	21.24	22.00	0-1
				1754.3	20393	21.31	22.00	0-1
			2	1710.7	19957	21.24	22.00	0-1
				1732.5	20175	21.21	22.00	0-1
				1754.3	20393	21.22	22.00	0-1
			3	1710.7	19957	21.19	22.00	0-1
				1732.5	20175	21.15	22.00	0-1
				1754.3	20393	21.18	22.00	0-1
		6RB		1710.7	19957	21.33	22.00	0-1
				1732.5	20175	20.80	22.00	0-1
				1754.3	20393	21.19	22.00	0-1
	16-QAM	1 RB	0	1710.7	19957	20.88	22.00	0-1
				1732.5	20175	20.99	22.00	0-1
				1754.3	20393	21.33	22.00	0-1
			2	1710.7	19957	21.14	22.00	0-1
				1732.5	20175	21.19	22.00	0-1
				1754.3	20393	21.30	22.00	0-1
			5	1710.7	19957	21.14	22.00	0-1
				1732.5	20175	20.99	22.00	0-1
				1754.3	20393	20.93	22.00	0-1
		3 RB	0	1710.7	19957	20.18	21.00	0-2
				1732.5	20175	20.18	21.00	0-2
				1754.3	20393	20.26	21.00	0-2
			2	1710.7	19957	20.23	21.00	0-2
				1732.5	20175	20.30	21.00	0-2
				1754.3	20393	20.14	21.00	0-2
			3	1710.7	19957	20.15	21.00	0-2
				1732.5	20175	20.32	21.00	0-2
				1754.3	20393	20.15	21.00	0-2
		6RB		1710.7	19957	20.28	21.00	0-2
				1732.5	20175	20.18	21.00	0-2
				1754.3	20393	20.33	21.00	0-2

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台灣檢驗科技股份有限公司

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FDD Band 4								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	64-QAM	1 RB	0	1710.7	19957	20.28	21.00	0-2
				1732.5	20175	20.20	21.00	0-2
				1754.3	20393	20.19	21.00	0-2
			2	1710.7	19957	20.25	21.00	0-2
				1732.5	20175	20.19	21.00	0-2
				1754.3	20393	20.31	21.00	0-2
			5	1710.7	19957	20.31	21.00	0-2
				1732.5	20175	20.20	21.00	0-2
				1754.3	20393	20.32	21.00	0-2
		3 RB	0	1710.7	19957	19.25	20.00	0-3
				1732.5	20175	19.20	20.00	0-3
				1754.3	20393	19.33	20.00	0-3
			2	1710.7	19957	19.29	20.00	0-3
				1732.5	20175	19.18	20.00	0-3
				1754.3	20393	19.22	20.00	0-3
			3	1710.7	19957	19.15	20.00	0-3
				1732.5	20175	19.16	20.00	0-3
				1754.3	20393	19.22	20.00	0-3
		6RB		1710.7	19957	19.21	20.00	0-3
				1732.5	20175	19.32	20.00	0-3
				1754.3	20393	19.28	20.00	0-3

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
10	QPSK	1 RB	0	829	20450	21.65	22.00	0
				836.5	20525	21.92	22.00	0
				844	20600	21.70	22.00	0
			25	829	20450	21.66	22.00	0
				836.5	20525	21.73	22.00	0
				844	20600	21.64	22.00	0
			49	829	20450	21.64	22.00	0
				836.5	20525	21.66	22.00	0
				844	20600	20.57	22.00	0
		25 RB	0	829	20450	20.78	21.00	0-1
				836.5	20525	20.70	21.00	0-1
				844	20600	20.65	21.00	0-1
			12	829	20450	20.70	21.00	0-1
				836.5	20525	20.73	21.00	0-1
				844	20600	20.60	21.00	0-1
			25	829	20450	20.60	21.00	0-1
				836.5	20525	20.70	21.00	0-1
				844	20600	20.60	21.00	0-1
		50RB	829	20450	20.70	21.00	0-1	
			836.5	20525	20.81	21.00	0-1	
			844	20600	20.61	21.00	0-1	
	16-QAM	1 RB	0	829	20450	20.14	21.00	0-1
				836.5	20525	20.44	21.00	0-1
				844	20600	20.16	21.00	0-1
			25	829	20450	20.59	21.00	0-1
				836.5	20525	20.65	21.00	0-1
				844	20600	20.74	21.00	0-1
			49	829	20450	20.87	21.00	0-1
				836.5	20525	20.89	21.00	0-1
				844	20600	20.81	21.00	0-1
		25 RB	0	829	20450	19.71	20.00	0-2
				836.5	20525	19.78	20.00	0-2
				844	20600	19.62	20.00	0-2
			12	829	20450	19.82	20.00	0-2
				836.5	20525	19.91	20.00	0-2
				844	20600	19.83	20.00	0-2
			25	829	20450	19.73	20.00	0-2
				836.5	20525	19.65	20.00	0-2
				844	20600	19.63	20.00	0-2
		50RB	829	20450	18.85	20.00	0-2	
			836.5	20525	20.00	20.00	0-2	
			844	20600	19.82	20.00	0-2	

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	64-QAM	1 RB	0	829	20450	19.93	20.00	0-2
				836.5	20525	19.84	20.00	0-2
				844	20600	19.83	20.00	0-2
			25	829	20450	19.71	20.00	0-2
				836.5	20525	19.74	20.00	0-2
				844	20600	19.76	20.00	0-2
			49	829	20450	19.89	20.00	0-2
				836.5	20525	19.87	20.00	0-2
				844	20600	18.98	20.00	0-2
		25 RB	0	829	20450	18.62	19.00	0-3
				836.5	20525	18.73	19.00	0-3
				844	20600	18.70	19.00	0-3
			12	829	20450	18.85	19.00	0-3
				836.5	20525	18.96	19.00	0-3
				844	20600	18.90	19.00	0-3
			25	829	20450	18.60	19.00	0-3
				836.5	20525	18.62	19.00	0-3
				844	20600	18.65	19.00	0-3
		50RB		829	20450	18.81	19.00	0-3
				836.5	20525	18.93	19.00	0-3
				844	20600	18.87	19.00	0-3

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FDD Band 5									
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)	
5	QPSK	1 RB	0	826.5	20425	21.41	22.00	0	
				836.5	20525	21.79	22.00	0	
				846.5	20625	21.58	22.00	0	
			12	826.5	20425	21.63	22.00	0	
				836.5	20525	21.61	22.00	0	
				846.5	20625	21.70	22.00	0	
			24	826.5	20425	21.68	22.00	0	
				836.5	20525	21.66	22.00	0	
				846.5	20625	21.30	22.00	0	
		12 RB	0	826.5	20425	20.63	21.00	0-1	
				836.5	20525	20.61	21.00	0-1	
				846.5	20625	20.66	21.00	0-1	
			6	826.5	20425	20.72	21.00	0-1	
				836.5	20525	20.76	21.00	0-1	
				846.5	20625	20.73	21.00	0-1	
			13	826.5	20425	20.77	21.00	0-1	
				836.5	20525	20.74	21.00	0-1	
				846.5	20625	20.70	21.00	0-1	
		25RB			826.5	20425	20.73	21.00	0-1
					836.5	20525	20.78	21.00	0-1
					846.5	20625	20.46	21.00	0-1
	16-QAM	1 RB	0	826.5	20425	20.82	21.00	0-1	
				836.5	20525	20.77	21.00	0-1	
				846.5	20625	20.80	21.00	0-1	
			12	826.5	20425	20.74	21.00	0-1	
				836.5	20525	20.65	21.00	0-1	
				846.5	20625	20.70	21.00	0-1	
			24	826.5	20425	20.95	21.00	0-1	
				836.5	20525	20.61	21.00	0-1	
				846.5	20625	20.84	21.00	0-1	
			12 RB	0	826.5	20425	19.66	20.00	0-2
					836.5	20525	19.61	20.00	0-2
					846.5	20625	19.59	20.00	0-2
				6	826.5	20425	19.84	20.00	0-2
					836.5	20525	19.92	20.00	0-2
					846.5	20625	19.79	20.00	0-2
		13	826.5	20425	19.68	20.00	0-2		
			836.5	20525	19.72	20.00	0-2		
			846.5	20625	19.71	20.00	0-2		
		25RB			826.5	20425	19.85	20.00	0-2
					836.5	20525	19.83	20.00	0-2
					846.5	20625	19.81	20.00	0-2

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
5	64-QAM	1 RB	0	826.5	20425	19.72	20.00	0-2
				836.5	20525	19.76	20.00	0-2
				846.5	20625	19.68	20.00	0-2
			12	826.5	20425	19.65	20.00	0-2
				836.5	20525	19.63	20.00	0-2
				846.5	20625	19.71	20.00	0-2
			24	826.5	20425	19.63	20.00	0-2
				836.5	20525	19.74	20.00	0-2
				846.5	20625	19.67	20.00	0-2
		12 RB	0	826.5	20425	18.68	19.00	0-3
				836.5	20525	18.74	19.00	0-3
				846.5	20625	18.59	19.00	0-3
			6	826.5	20425	18.83	19.00	0-3
				836.5	20525	18.84	19.00	0-3
				846.5	20625	18.99	19.00	0-3
			13	826.5	20425	18.86	19.00	0-3
				836.5	20525	18.83	19.00	0-3
				846.5	20625	18.93	19.00	0-3
		25RB		826.5	20425	18.84	19.00	0-3
				836.5	20525	18.83	19.00	0-3
				846.5	20625	18.94	19.00	0-3

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	825.5	20415	21.39	22.00	0
				836.5	20525	21.69	22.00	0
				847.5	20635	21.54	22.00	0
			7	825.5	20415	21.74	22.00	0
				836.5	20525	21.72	22.00	0
				847.5	20635	21.77	22.00	0
			14	825.5	20415	21.65	22.00	0
				836.5	20525	21.70	22.00	0
				847.5	20635	21.43	22.00	0
		8 RB	0	825.5	20415	20.78	21.00	0-1
				836.5	20525	20.61	21.00	0-1
				847.5	20635	20.62	21.00	0-1
			4	825.5	20415	20.69	21.00	0-1
				836.5	20525	20.81	21.00	0-1
				847.5	20635	20.78	21.00	0-1
			7	825.5	20415	20.77	21.00	0-1
				836.5	20525	20.69	21.00	0-1
				847.5	20635	20.75	21.00	0-1
		15RB		825.5	20415	20.43	21.00	0-1
				836.5	20525	20.81	21.00	0-1
				847.5	20635	20.79	21.00	0-1
	16-QAM	1 RB	0	825.5	20415	20.56	21.00	0-1
				836.5	20525	20.98	21.00	0-1
				847.5	20635	20.70	21.00	0-1
			7	825.5	20415	20.71	21.00	0-1
				836.5	20525	20.66	21.00	0-1
				847.5	20635	20.76	21.00	0-1
			14	825.5	20415	20.59	21.00	0-1
				836.5	20525	20.72	21.00	0-1
				847.5	20635	20.85	21.00	0-1
		8 RB	0	825.5	20415	19.61	20.00	0-2
				836.5	20525	19.70	20.00	0-2
				847.5	20635	19.77	20.00	0-2
			4	825.5	20415	19.85	20.00	0-2
				836.5	20525	19.96	20.00	0-2
				847.5	20635	19.91	20.00	0-2
			7	825.5	20415	19.68	20.00	0-2
				836.5	20525	19.64	20.00	0-2
				847.5	20635	19.64	20.00	0-2
		15RB		825.5	20415	19.84	20.00	0-2
				836.5	20525	19.97	20.00	0-2
				847.5	20635	19.91	20.00	0-2

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SGS Taiwan Ltd.

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Member of SGS Group

FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	64-QAM	1 RB	0	825.5	20415	19.73	20.00	0-2
				836.5	20525	19.76	20.00	0-2
				847.5	20635	19.78	20.00	0-2
			7	825.5	20415	19.60	20.00	0-2
				836.5	20525	19.64	20.00	0-2
				847.5	20635	19.62	20.00	0-2
			14	825.5	20415	19.59	20.00	0-2
				836.5	20525	19.65	20.00	0-2
				847.5	20635	18.62	20.00	0-2
		8 RB	0	825.5	20415	18.66	19.00	0-3
				836.5	20525	18.77	19.00	0-3
				847.5	20635	18.60	19.00	0-3
			4	825.5	20415	18.91	19.00	0-3
				836.5	20525	18.87	19.00	0-3
				847.5	20635	18.99	19.00	0-3
			7	825.5	20415	18.85	19.00	0-3
				836.5	20525	18.99	19.00	0-3
				847.5	20635	18.84	19.00	0-3
		15RB		825.5	20415	18.91	19.00	0-3
				836.5	20525	18.91	19.00	0-3
				847.5	20635	18.81	19.00	0-3

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	824.7	20407	21.15	22.00	0
				836.5	20525	21.61	22.00	0
				848.3	20643	21.56	22.00	0
			2	824.7	20407	21.62	22.00	0
				836.5	20525	21.75	22.00	0
				848.3	20643	21.75	22.00	0
			5	824.7	20407	21.81	22.00	0
				836.5	20525	21.90	22.00	0
				848.3	20643	21.77	22.00	0
		3 RB	0	824.7	20407	20.67	21.00	0-1
				836.5	20525	20.63	21.00	0-1
				848.3	20643	20.61	21.00	0-1
			2	824.7	20407	20.98	21.00	0-1
				836.5	20525	20.90	21.00	0-1
				848.3	20643	20.83	21.00	0-1
			3	824.7	20407	20.99	21.00	0-1
				836.5	20525	20.91	21.00	0-1
				848.3	20643	20.96	21.00	0-1
		6RB		824.7	20407	20.87	21.00	0-1
				836.5	20525	20.99	21.00	0-1
				848.3	20643	20.89	21.00	0-1
	16-QAM	1 RB	0	824.7	20407	20.90	21.00	0-1
				836.5	20525	20.99	21.00	0-1
				848.3	20643	21.00	21.00	0-1
			2	824.7	20407	20.88	21.00	0-1
				836.5	20525	20.86	21.00	0-1
				848.3	20643	20.92	21.00	0-1
			5	824.7	20407	20.89	21.00	0-1
				836.5	20525	20.85	21.00	0-1
				848.3	20643	20.95	21.00	0-1
		3 RB	0	824.7	20407	19.90	20.00	0-2
				836.5	20525	19.88	20.00	0-2
				848.3	20643	19.93	20.00	0-2
			2	824.7	20407	19.96	20.00	0-2
				836.5	20525	19.93	20.00	0-2
				848.3	20643	19.90	20.00	0-2
			3	824.7	20407	19.93	20.00	0-2
				836.5	20525	19.81	20.00	0-2
				848.3	20643	19.90	20.00	0-2
		6RB		824.7	20407	19.98	20.00	0-2
				836.5	20525	19.83	20.00	0-2
				848.3	20643	19.87	20.00	0-2

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FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	64-QAM	1 RB	0	824.7	20407	19.91	20.00	0-2
				836.5	20525	19.82	20.00	0-2
				848.3	20643	19.99	20.00	0-2
			2	824.7	20407	19.63	20.00	0-2
				836.5	20525	19.70	20.00	0-2
				848.3	20643	19.76	20.00	0-2
			5	824.7	20407	19.76	20.00	0-2
				836.5	20525	19.59	20.00	0-2
				848.3	20643	19.68	20.00	0-2
		3 RB	0	824.7	20407	18.61	19.00	0-3
				836.5	20525	18.65	19.00	0-3
				848.3	20643	18.70	19.00	0-3
			2	824.7	20407	18.62	19.00	0-3
				836.5	20525	18.60	19.00	0-3
				848.3	20643	18.72	19.00	0-3
			3	824.7	20407	18.59	19.00	0-3
				836.5	20525	18.61	19.00	0-3
				848.3	20643	18.69	19.00	0-3
		6RB		824.7	20407	18.78	19.00	0-3
				836.5	20525	18.63	19.00	0-3
				848.3	20643	18.76	19.00	0-3

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
10	QPSK	1 RB	0	704	23060	21.88	22.50	0
				707.5	23095	21.76	22.50	0
				711	23130	21.76	22.50	0
			25	704	23060	22.11	22.50	0
				707.5	23095	21.73	22.50	0
				711	23130	21.83	22.50	0
			49	704	23060	20.77	22.50	0
				707.5	23095	21.77	22.50	0
				711	23130	21.90	22.50	0
		25 RB	0	704	23060	20.78	21.50	0-1
				707.5	23095	20.88	21.50	0-1
				711	23130	20.78	21.50	0-1
			12	704	23060	20.84	21.50	0-1
				707.5	23095	20.85	21.50	0-1
				711	23130	20.94	21.50	0-1
			25	704	23060	20.80	21.50	0-1
				707.5	23095	20.70	21.50	0-1
				711	23130	20.74	21.50	0-1
		50RB	704	23060	19.88	21.50	0-1	
			707.5	23095	19.81	21.50	0-1	
			711	23130	20.96	21.50	0-1	
	16-QAM	1 RB	0	704	23060	20.31	21.50	0-1
				707.5	23095	20.22	21.50	0-1
				711	23130	20.16	21.50	0-1
			25	704	23060	20.73	21.50	0-1
				707.5	23095	20.76	21.50	0-1
				711	23130	20.81	21.50	0-1
			49	704	23060	20.55	21.50	0-1
				707.5	23095	20.10	21.50	0-1
				711	23130	20.33	21.50	0-1
		25 RB	0	704	23060	19.70	20.50	0-2
				707.5	23095	19.82	20.50	0-2
				711	23130	19.74	20.50	0-2
			12	704	23060	18.91	20.50	0-2
				707.5	23095	19.90	20.50	0-2
				711	23130	18.95	20.50	0-2
			25	704	23060	19.71	20.50	0-2
				707.5	23095	19.82	20.50	0-2
				711	23130	19.84	20.50	0-2
		50RB	704	23060	18.89	20.50	0-2	
			707.5	23095	19.86	20.50	0-2	
			711	23130	19.93	20.50	0-2	

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
10	64-QAM	1 RB	0	704	23060	20.13	20.50	0-2
				707.5	23095	20.01	20.50	0-2
				711	23130	20.04	20.50	0-2
			25	704	23060	19.71	20.50	0-2
				707.5	23095	19.85	20.50	0-2
				711	23130	19.70	20.50	0-2
			49	704	23060	19.96	20.50	0-2
				707.5	23095	20.01	20.50	0-2
				711	23130	20.11	20.50	0-2
		25 RB	0	704	23060	18.81	19.50	0-3
				707.5	23095	18.83	19.50	0-3
				711	23130	18.86	19.50	0-3
			12	704	23060	19.31	19.50	0-3
				707.5	23095	19.46	19.50	0-3
				711	23130	19.36	19.50	0-3
			25	704	23060	19.50	19.50	0-3
				707.5	23095	19.38	19.50	0-3
				711	23130	19.50	19.50	0-3
		50RB		704	23060	19.32	19.50	0-3
				707.5	23095	19.41	19.50	0-3
				711	23130	19.34	19.50	0-3

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
5	QPSK	1 RB	0	701.5	23035	21.57	22.50	0
				707.5	23095	21.85	22.50	0
				713.5	23155	21.49	22.50	0
			12	701.5	23035	21.82	22.50	0
				707.5	23095	21.84	22.50	0
				713.5	23155	21.85	22.50	0
			24	701.5	23035	21.51	22.50	0
				707.5	23095	21.78	22.50	0
				713.5	23155	21.60	22.50	0
		12 RB	0	701.5	23035	20.82	21.50	0-1
				707.5	23095	20.74	21.50	0-1
				713.5	23155	20.75	21.50	0-1
			6	701.5	23035	20.97	21.50	0-1
				707.5	23095	20.87	21.50	0-1
				713.5	23155	20.91	21.50	0-1
			13	701.5	23035	20.70	21.50	0-1
				707.5	23095	20.87	21.50	0-1
				713.5	23155	20.84	21.50	0-1
		25RB		701.5	23035	20.96	21.50	0-1
				707.5	23095	20.87	21.50	0-1
				713.5	23155	21.02	21.50	0-1
	16-QAM	1 RB	0	701.5	23035	21.29	21.50	0-1
				707.5	23095	20.88	21.50	0-1
				713.5	23155	21.21	21.50	0-1
			12	701.5	23035	20.80	21.50	0-1
				707.5	23095	20.86	21.50	0-1
				713.5	23155	20.71	21.50	0-1
			24	701.5	23035	20.42	21.50	0-1
				707.5	23095	20.77	21.50	0-1
				713.5	23155	20.95	21.50	0-1
		12 RB	0	701.5	23035	19.88	20.50	0-2
				707.5	23095	19.73	20.50	0-2
				713.5	23155	19.78	20.50	0-2
			6	701.5	23035	19.95	20.50	0-2
				707.5	23095	19.97	20.50	0-2
				713.5	23155	20.00	20.50	0-2
			13	701.5	23035	19.70	20.50	0-2
				707.5	23095	19.71	20.50	0-2
				713.5	23155	19.85	20.50	0-2
		25RB		701.5	23035	19.91	20.50	0-2
				707.5	23095	19.85	20.50	0-2
				713.5	23155	20.00	20.50	0-2

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
5	64-QAM	1 RB	0	701.5	23035	20.43	20.50	0-2
				707.5	23095	20.47	20.50	0-2
				713.5	23155	20.36	20.50	0-2
			12	701.5	23035	20.50	20.50	0-2
				707.5	23095	20.47	20.50	0-2
				713.5	23155	20.49	20.50	0-2
			24	701.5	23035	20.40	20.50	0-2
				707.5	23095	20.33	20.50	0-2
				713.5	23155	20.43	20.50	0-2
		12 RB	0	701.5	23035	19.48	19.50	0-3
				707.5	23095	19.37	19.50	0-3
				713.5	23155	19.46	19.50	0-3
			6	701.5	23035	19.44	19.50	0-3
				707.5	23095	19.37	19.50	0-3
				713.5	23155	19.46	19.50	0-3
			13	701.5	23035	19.50	19.50	0-3
				707.5	23095	19.47	19.50	0-3
				713.5	23155	19.32	19.50	0-3
		25RB		701.5	23035	19.43	19.50	0-3
				707.5	23095	19.31	19.50	0-3
				713.5	23155	19.44	19.50	0-3

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	700.5	23025	21.83	22.50	0
				707.5	23095	21.77	22.50	0
				714.5	23165	21.79	22.50	0
			7	700.5	23025	21.75	22.50	0
				707.5	23095	21.79	22.50	0
				714.5	23165	21.69	22.50	0
			14	700.5	23025	21.87	22.50	0
				707.5	23095	21.48	22.50	0
				714.5	23165	21.72	22.50	0
		8 RB	0	700.5	23025	20.80	21.50	0-1
				707.5	23095	20.73	21.50	0-1
				714.5	23165	20.88	21.50	0-1
			4	700.5	23025	20.97	21.50	0-1
				707.5	23095	20.90	21.50	0-1
				714.5	23165	21.09	21.50	0-1
			7	700.5	23025	20.83	21.50	0-1
				707.5	23095	20.87	21.50	0-1
				714.5	23165	20.84	21.50	0-1
		15RB		700.5	23025	20.96	21.50	0-1
				707.5	23095	20.93	21.50	0-1
				714.5	23165	20.99	21.50	0-1
	16-QAM	1 RB	0	700.5	23025	21.19	21.50	0-1
				707.5	23095	20.82	21.50	0-1
				714.5	23165	20.22	21.50	0-1
			7	700.5	23025	20.76	21.50	0-1
				707.5	23095	20.88	21.50	0-1
				714.5	23165	20.78	21.50	0-1
			14	700.5	23025	20.89	21.50	0-1
				707.5	23095	20.56	21.50	0-1
				714.5	23165	20.87	21.50	0-1
		8 RB	0	700.5	23025	19.70	20.50	0-2
				707.5	23095	19.70	20.50	0-2
				714.5	23165	19.83	20.50	0-2
			4	700.5	23025	19.93	20.50	0-2
				707.5	23095	19.92	20.50	0-2
				714.5	23165	19.99	20.50	0-2
			7	700.5	23025	19.81	20.50	0-2
				707.5	23095	19.76	20.50	0-2
				714.5	23165	19.88	20.50	0-2
		15RB		700.5	23025	19.98	20.50	0-2
				707.5	23095	19.94	20.50	0-2
				714.5	23165	20.00	20.50	0-2

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	64-QAM	1 RB	0	700.5	23025	20.45	20.50	0-2
				707.5	23095	20.32	20.50	0-2
				714.5	23165	20.41	20.50	0-2
			7	700.5	23025	20.44	20.50	0-2
				707.5	23095	20.34	20.50	0-2
				714.5	23165	20.35	20.50	0-2
			14	700.5	23025	20.32	20.50	0-2
				707.5	23095	20.49	20.50	0-2
				714.5	23165	20.46	20.50	0-2
		8 RB	0	700.5	23025	19.40	19.50	0-3
				707.5	23095	19.49	19.50	0-3
				714.5	23165	19.34	19.50	0-3
			4	700.5	23025	19.34	19.50	0-3
				707.5	23095	19.32	19.50	0-3
				714.5	23165	19.41	19.50	0-3
			7	700.5	23025	19.33	19.50	0-3
				707.5	23095	19.36	19.50	0-3
				714.5	23165	19.31	19.50	0-3
		15RB		700.5	23025	19.32	19.50	0-3
				707.5	23095	19.41	19.50	0-3
				714.5	23165	19.35	19.50	0-3

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
1.4	QPSK	1 RB	0	699.7	23017	21.37	22.50	0
				707.5	23095	21.90	22.50	0
				715.3	23173	22.07	22.50	0
			2	699.7	23017	21.76	22.50	0
				707.5	23095	21.79	22.50	0
				715.3	23173	21.70	22.50	0
			5	699.7	23017	22.00	22.50	0
				707.5	23095	21.92	22.50	0
				715.3	23173	22.03	22.50	0
		3 RB	0	699.7	23017	20.82	21.50	0-1
				707.5	23095	20.77	21.50	0-1
				715.3	23173	20.78	21.50	0-1
			2	699.7	23017	21.40	21.50	0-1
				707.5	23095	21.45	21.50	0-1
				715.3	23173	21.50	21.50	0-1
			3	699.7	23017	20.72	21.50	0-1
				707.5	23095	20.74	21.50	0-1
				715.3	23173	20.84	21.50	0-1
		6RB		699.7	23017	21.00	21.50	0-1
				707.5	23095	20.93	21.50	0-1
				715.3	23173	21.07	21.50	0-1
	16-QAM	1 RB	0	699.7	23017	20.82	21.50	0-1
				707.5	23095	21.09	21.50	0-1
				715.3	23173	21.22	21.50	0-1
			2	699.7	23017	20.73	21.50	0-1
				707.5	23095	20.78	21.50	0-1
				715.3	23173	20.80	21.50	0-1
			5	699.7	23017	20.97	21.50	0-1
				707.5	23095	21.32	21.50	0-1
				715.3	23173	21.18	21.50	0-1
		3 RB	0	699.7	23017	19.78	20.50	0-2
				707.5	23095	19.83	20.50	0-2
				715.3	23173	19.82	20.50	0-2
			2	699.7	23017	20.34	20.50	0-2
				707.5	23095	20.45	20.50	0-2
				715.3	23173	20.32	20.50	0-2
			3	699.7	23017	20.38	20.50	0-2
				707.5	23095	20.37	20.50	0-2
				715.3	23173	20.36	20.50	0-2
		6RB		699.7	23017	20.36	20.50	0-2
				707.5	23095	20.41	20.50	0-2
				715.3	23173	20.39	20.50	0-2

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FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
1.4	64-QAM	1 RB	0	699.7	23017	20.44	20.50	0-2
				707.5	23095	20.47	20.50	0-2
				715.3	23173	20.39	20.50	0-2
			2	699.7	23017	20.35	20.50	0-2
				707.5	23095	20.39	20.50	0-2
				715.3	23173	20.50	20.50	0-2
			5	699.7	23017	20.45	20.50	0-2
				707.5	23095	20.41	20.50	0-2
				715.3	23173	20.41	20.50	0-2
		3 RB	0	699.7	23017	19.31	19.50	0-3
				707.5	23095	19.33	19.50	0-3
				715.3	23173	19.36	19.50	0-3
			2	699.7	23017	19.37	19.50	0-3
				707.5	23095	19.43	19.50	0-3
				715.3	23173	19.38	19.50	0-3
			3	699.7	23017	19.39	19.50	0-3
				707.5	23095	19.50	19.50	0-3
				715.3	23173	19.37	19.50	0-3
		6RB		699.7	23017	19.41	19.50	0-3
				707.5	23095	19.48	19.50	0-3
				715.3	23173	19.38	19.50	0-3

Bluetooth conducted power table:

Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg.Power + Max. Tolerance (dBm)	Average Output Power (dBm)
Bluetooth 4.0_1M	CH 37	2402	4	3.54
	CH 17	2440		3.38
	CH 39	2480		3.20
Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg.Power	Average Output Power (dBm)
Bluetooth 4.0_2M	CH 37	2402	4	3.56
	CH 17	2440		3.39
	CH 39	2480		3.19

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1.4 Test Environment

Ambient Temperature: $22 \pm 2^\circ \text{C}$
Tissue Simulating Liquid: $22 \pm 2^\circ \text{C}$

1.5 Operation Description

1. The EUT is controlled by using a Radio Communication Tester, and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. 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 $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA).

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

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

5. 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 $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA).

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

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

6. LTE modes test according to KDB 941225D05v02r05.

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

- Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.

- When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.

- When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

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

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

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

- For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg.

- Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

d. Per Section 5.2.4, Higher order modulations

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

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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.

7. According to KDB447498D01v06, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is ≤ 0.8 W/kg, when the transmission band is ≤ 100MHz.
8. 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. The device was tested based on FCC KDB inquiry guidance.
10. BT SAR is excluded from testing based on KDB 447498 D01.

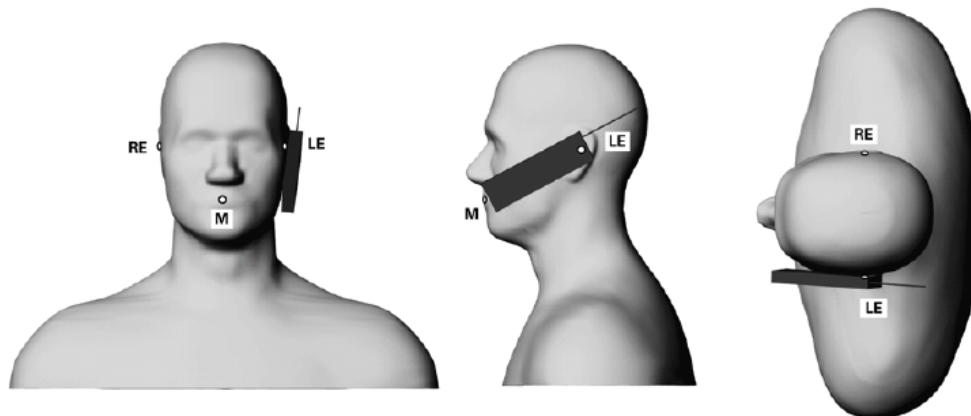
Mode	Max. tune-up power(dBm)	Max. tune-up power(mW)	Top View				
			Test separation distance (mm)	Calculation value	Exclusion thresholds	Require SAR testing?	Estimated SAR (W/kg)
Bluetooth	4	2.512	15	0.264	3.000	NO	0.035

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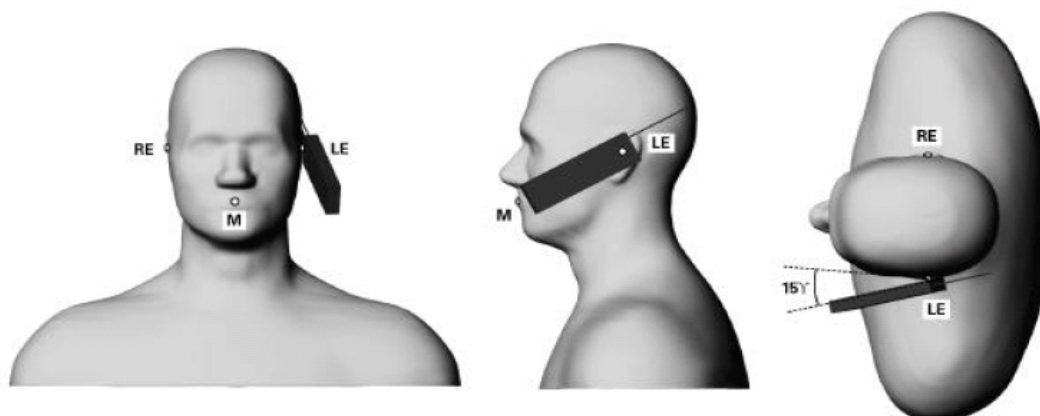
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1.6 Positioning Procedure

Head SAR measurement statement



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



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

Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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1.7 Evaluation Procedures

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

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

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

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

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

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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 then moved around until the highest averaged SAR is found.

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

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1.8 Probe Calibration Procedures

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

1.8.1 Transfer Calibration with Temperature Probes

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

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

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

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

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

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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 ($\sim 2\%$ 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 $\pm 5\%$.
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 $\pm 10\%$ (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 $\pm 5\%$ (RSS) when the same liquid is used for the calibration and for actual measurements and $\pm 7-9\%$ (RSS) when not, which is in good agreement with the estimates given in [2].

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1.8.2 Calibration with Analytical Fields

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

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

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

References

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

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1.9 The SAR Measurement System

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

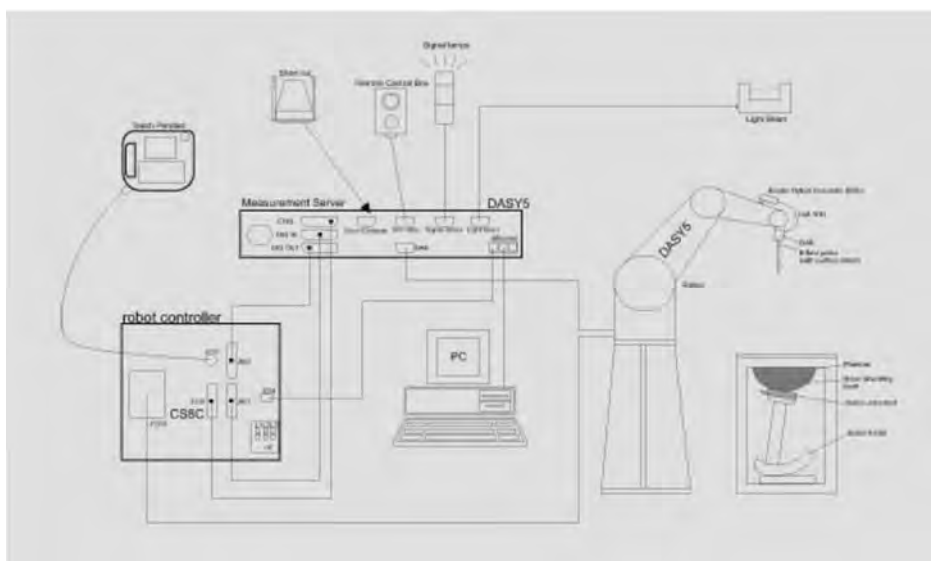


Fig. a A block diagram of the SAR measurement system

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


1. A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
7. A computer operating Windows7
8. DASY 5 software.
9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
10. The SAM twin phantom enabling testing left-hand and right-hand usage.
11. The device holder for handheld mobile phones.
12. Tissue simulating liquid mixed according to the given recipes.
13. Validation dipole kits allowing to validate the proper functioning of the system.

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1.10 System Components

EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 750/835/ /1750/1900 MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.6 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
Dimensions	Tip diameter: 2.5 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

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PHANTOM

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



DEVICE HOLDER

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

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1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ (according to KDB865664D01) from the target SAR values. These tests were done at 750/835/1750/1900 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the liquid depth above the ear reference points was above 15 cm ($\leq 3G$) or 10 cm ($> 3G$) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

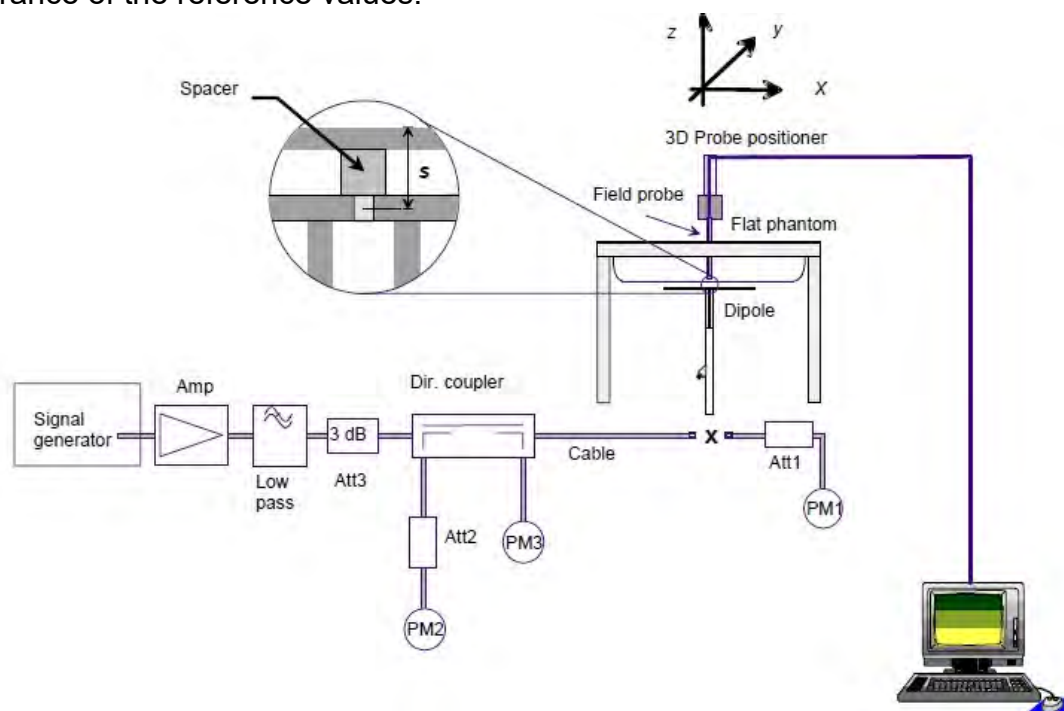


Fig. b The block diagram of system verification

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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	2.05	8.20	-3.30%	Dec, 05, 2020
D835V2	4d063	835	Head	9.52	2.24	8.96	-5.88%	Dec, 05, 2020
D1750V2	1008	1750	Head	36.00	8.36	33.44	-7.11%	Dec, 06, 2020
D1900V2	5d173	1900	Head	39.40	9.50	38.00	-3.55%	Dec, 07, 2020

Table 1. Results of system validation

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1.12 Tissue Simulant Fluid for the Frequency Band

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

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

(Appendix Fig. 2)

Tissue Type	Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, ϵ_r	Target Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ_r	Measured Conductivity, σ (S/m)	% dev ϵ_r	% dev σ
Head	Dec. 05. 2020	704.00	42.181	0.890	43.441	0.848	2.99%	-4.70%
		707.50	42.162	0.890	43.431	0.858	3.01%	-3.60%
		711.00	42.144	0.890	43.396	0.862	2.97%	-3.18%
		750.00	41.942	0.893	42.923	0.890	2.34%	-0.38%
	Dec. 06. 2020	826.40	41.545	0.899	42.165	0.886	1.49%	-1.48%
		829.00	41.531	0.900	42.162	0.889	1.52%	-1.17%
		835.00	41.500	0.900	41.862	0.891	0.87%	-1.00%
		836.50	41.500	0.902	41.818	0.895	0.77%	-0.73%
		836.60	41.500	0.902	41.121	0.897	-0.91%	-0.52%
		844.00	41.500	0.910	41.115	0.901	-0.93%	-0.96%
		846.60	41.500	0.912	41.075	0.909	-1.02%	-0.38%
	Dec. 07. 2020	1720.00	40.126	1.354	38.809	1.310	-3.28%	-3.23%
		1732.50	40.107	1.361	38.773	1.334	-3.33%	-1.98%
		1745.00	40.087	1.368	38.756	1.341	-3.32%	-1.98%
		1750.00	40.079	1.371	38.741	1.358	-3.34%	-0.95%
	Dec. 08. 2020	1852.40	40.000	1.400	40.808	1.358	2.02%	-3.00%
		1860.00	40.000	1.400	38.342	1.378	-4.15%	-1.57%
		1880.00	40.000	1.400	38.337	1.389	-4.16%	-0.79%
		1900.00	40.000	1.400	38.225	1.410	-4.44%	0.71%
		1907.60	40.000	1.400	38.149	1.422	-4.63%	1.57%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

Frequency (MHz)	Mode	Ingredient						Total amount
		DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	
750	Head	—	532.98 g	18.3 g	2.4 g	3.2 g	766 g	1.3L(Kg)
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)

Table 3. Recipes for tissue simulating liquid

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1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1, By the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

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

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

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

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

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

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

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

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

Table 4. RF exposure limits

Notes:

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

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2. Summary of Results

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

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
WCDMA Band II	Top side	15	9262	1852.4	24.00	23.10	123.03%	0.732	0.901	-
	Top side	15	9400	1880	24.00	23.05	124.45%	0.642	0.799	-
	Top side	15	9538	1907.6	24.00	23.11	122.74%	0.831	1.020	74
	Top side*	15	9538	1907.6	24.00	23.11	122.74%	0.792	0.972	-
	Bottom side	15	9538	1907.6	24.00	23.11	122.74%	0.012	0.015	-
	Right side	15	9538	1907.6	24.00	23.11	122.74%	0.030	0.037	-
	Left side	15	9538	1907.6	24.00	23.11	122.74%	0.009	0.011	-

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

WCDMA Band V

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
WCDMA Band V	Top side	15	4233	846.6	25.50	23.27	167.11%	0.462	0.772	75
	Bottom side	15	4233	846.6	25.50	23.27	167.11%	0.008	0.013	-
	Right side	15	4233	846.6	25.50	23.27	167.11%	0.022	0.037	-
	Left side	15	4233	846.6	25.50	23.27	167.11%	0.006	0.010	-

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LTE FDD Band 2

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 2	20MHz	QPSK	1 RB	99	Top side	15	18700	1860	23.00	22.93	101.62%	0.873	0.887	76
					Top side*	15	18700	1860	23.00	22.93	101.62%	0.821	0.834	-
					Top side	15	18900	1880	23.00	22.91	102.09%	0.833	0.850	-
					Top side	15	19100	1900	23.00	22.84	103.75%	0.754	0.782	-
					Bottom side	15	18700	1860	23.00	22.93	101.62%	0.035	0.036	-
					Right side	15	18700	1860	23.00	22.93	101.62%	0.094	0.096	-
			50 RB	50	Left side	15	18700	1860	23.00	22.93	101.62%	0.013	0.014	-
					Top side	15	19100	1900	22.00	21.53	111.43%	0.622	0.693	-
					Bottom side	15	19100	1900	22.00	21.53	111.43%	0.029	0.032	-
					Right side	15	19100	1900	22.00	21.53	111.43%	0.084	0.094	-
					Left side	15	19100	1900	22.00	21.53	111.43%	0.012	0.013	-
					Top side	15	19100	1900	22.00	21.21	119.95%	0.451	0.541	-
			100 RB	50	Bottom side	15	19100	1900	22.00	21.21	119.95%	0.026	0.031	-
					Right side	15	19100	1900	22.00	21.21	119.95%	0.071	0.085	-
					Left side	15	19100	1900	22.00	21.21	119.95%	0.010	0.012	-

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

LTE FDD Band 4

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 4	10MHz	QPSK	1 RB	0	Top side	15	20050	1720	23.00	22.54	111.17%	0.605	0.673	77
					Bottom side	15	20050	1720	23.00	22.54	111.17%	0.010	0.011	-
					Right side	15	20050	1720	23.00	22.54	111.17%	0.074	0.082	-
					Left side	15	20050	1720	23.00	22.54	111.17%	0.009	0.010	-
			50 RB	0	Top side	15	20300	1745	22.00	21.36	115.88%	0.436	0.505	-
					Bottom side	15	20300	1745	22.00	21.36	115.88%	0.008	0.009	-
					Right side	15	20300	1745	22.00	21.36	115.88%	0.064	0.074	-
					Left side	15	20300	1745	22.00	21.36	115.88%	0.007	0.009	-
			100 RB	0	Top side	15	20300	1745	22.00	21.33	116.68%	0.365	0.426	-
					Bottom side	15	20300	1745	22.00	21.33	116.68%	0.006	0.007	-
					Right side	15	20300	1745	22.00	21.33	116.68%	0.056	0.065	-
					Left side	15	20300	1745	22.00	21.33	116.68%	0.004	0.005	-

LTE FDD Band 5

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 5	10MHz	QPSK	1 RB	0	Top side	15	20525	836.5	22.50	21.92	114.29%	0.747	0.854	78
					Top side	15	20600	844	22.50	21.70	120.23%	0.683	0.821	-
					Bottom side	15	20525	836.5	22.50	21.92	114.29%	0.018	0.021	-
					Right side	15	20525	836.5	22.50	21.92	114.29%	0.065	0.074	-
					Left side	15	20525	836.5	22.50	21.92	114.29%	0.014	0.016	-
					Top side	15	20450	829	22.50	21.66	121.34%	0.587	0.712	-
			25 RB	0	Top side	15	20450	829	21.50	20.78	118.03%	0.572	0.675	-
					Bottom side	15	20450	829	21.50	20.78	118.03%	0.016	0.019	-
					Right side	15	20450	829	21.50	20.78	118.03%	0.052	0.061	-
					Left side	15	20450	829	21.50	20.78	118.03%	0.013	0.015	-
					Top side	15	20525	836.5	21.50	20.81	117.22%	0.465	0.545	-
					Bottom side	15	20525	836.5	21.50	20.81	117.22%	0.014	0.016	-
			50 RB	0	Right side	15	20525	836.5	21.50	20.81	117.22%	0.045	0.053	-
					Left side	15	20525	836.5	21.50	20.81	117.22%	0.011	0.013	-

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LTE FDD Band 12

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
LTE Band 12	10MHz	QPSK	1 RB	25	Top side	15	23060	704	22.50	22.11	109.40%	0.873	0.955	79
					Top side*	15	23060	704	22.50	22.11	109.40%	0.823	0.900	-
					Bottom side	15	23060	704	22.50	22.11	109.40%	0.029	0.032	-
					Right side	15	23060	704	22.50	22.11	109.40%	0.073	0.080	-
				49	Left side	15	23060	704	22.50	22.11	109.40%	0.021	0.023	-
					Top side	15	23095	707.5	22.50	21.77	118.30%	0.751	0.888	-
					Top side	15	23130	711	22.50	21.90	114.82%	0.734	0.843	-
					Top side	15	23130	711	21.50	20.94	113.76%	0.697	0.793	-
			50 RB	50	Bottom side	15	23130	711	21.50	20.94	113.76%	0.025	0.029	-
					Right side	15	23130	711	21.50	20.94	113.76%	0.063	0.072	-
					Left side	15	23130	711	21.50	20.94	113.76%	0.019	0.022	-
					Top side	15	23130	711	21.50	20.96	113.24%	0.634	0.718	-
			100 RB		Bottom side	15	23130	711	21.50	20.96	113.24%	0.021	0.024	-
					Right side	15	23130	711	21.50	20.96	113.24%	0.056	0.064	-
					Left side	15	23130	711	21.50	20.96	113.24%	0.018	0.020	-

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

2.3 Reporting statements of conformity

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

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3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

Simultaneous Transmit Configurations	Body
WWAN + BT	Yes

Frequency band	Position	reported SAR / W/kg		ΣSAR
		1	2	<2.0W/kg
		WWAN	BT	1+2 sum
WCDMA II	Top side_15mm	1.020	0.035	1.055
	Bottom side_15mm	0.015	0.035	0.050
	Right side_15mm	0.037	0.035	0.072
	Left side_15mm	0.011	0.035	0.046
WCDMA V	Top side_15mm	0.772	0.035	0.807
	Bottom side_15mm	0.013	0.035	0.048
	Right side_15mm	0.037	0.035	0.072
	Left side_15mm	0.010	0.035	0.045
LTE Band 2	Top side_15mm	0.887	0.035	0.922
	Bottom side_15mm	0.036	0.035	0.071
	Right side_15mm	0.096	0.035	0.131
	Left side_15mm	0.014	0.035	0.049
LTE Band 4	Top side_15mm	0.673	0.035	0.708
	Bottom side_15mm	0.011	0.035	0.046
	Right side_15mm	0.082	0.035	0.117
	Left side_15mm	0.010	0.035	0.045
LTE Band 5	Top side_15mm	0.854	0.035	0.889
	Bottom side_15mm	0.021	0.035	0.056
	Right side_15mm	0.074	0.035	0.109
	Left side_15mm	0.016	0.035	0.051
LTE Band 12	Top side_15mm	0.955	0.035	0.990
	Bottom side_15mm	0.032	0.035	0.067
	Right side_15mm	0.080	0.035	0.115
	Left side_15mm	0.023	0.035	0.058

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4. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	7509	Mar.25,2020	Mar.24,2021
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
SPEAG	Data acquisition Electronics	DAE4	877	Mar.17,2020	Mar.16,2021
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	Dec.12,2019	Dec.11,2020
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
TECPEL	Digital thermometer	DTM-303A	TP190085	Dec.16,2019	Dec.15,2020
Anritsu	Radio Communication Test	MT8820C	6201061014	Dec.08,2019	Dec.07,2020

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5. Measurements

Date: 2020/12/7

Report No. : ES/2020/70001

WCDMA Band II_Body_Top side_CH 9538_15mm

Communication System: WCDMA; Frequency: 1907.6 MHz; Duty cycle= 1:1

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.422$ S/m; $\epsilon_r = 38.149$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 23.0°C; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(8.07, 8.07, 8.07) @ 1907.6 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- 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) = 1.13 W/kg

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

Reference Value = 18.10 V/m; Power Drift = -0.07 dB

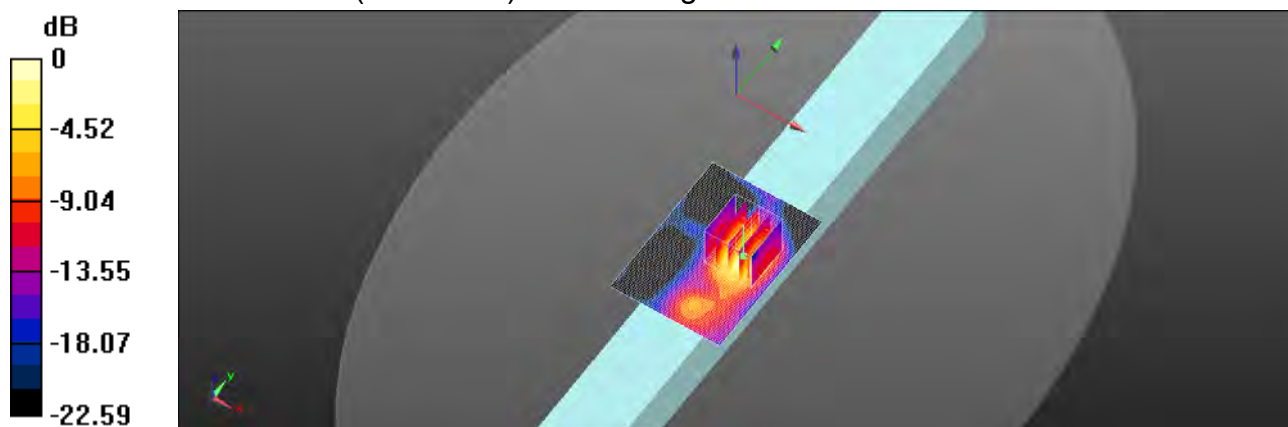
Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.831 W/kg; SAR(10 g) = 0.394 W/kg

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 57.3%

Maximum value of SAR (measured) = 1.23 W/kg



0 dB = 1.23 W/kg = 0.90 dBW/kg

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Date: 2020/12/5

Report No. : ES/2020/70001

WCDMA Band V_Body_Top side_CH 4233_15mm

Communication System: WCDMA; Frequency: 846.6 MHz; Duty cycle= 1:1

Medium parameters used: $f = 847$ MHz; $\sigma = 0.909$ S/m; $\epsilon_r = 41.075$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.5°C; Liquid temperature: 22.6°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(9.73, 9.73, 9.73) @ 846.6 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- 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) = 0.654 W/kg

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

Reference Value = 25.82 V/m; Power Drift = 0.07 dB

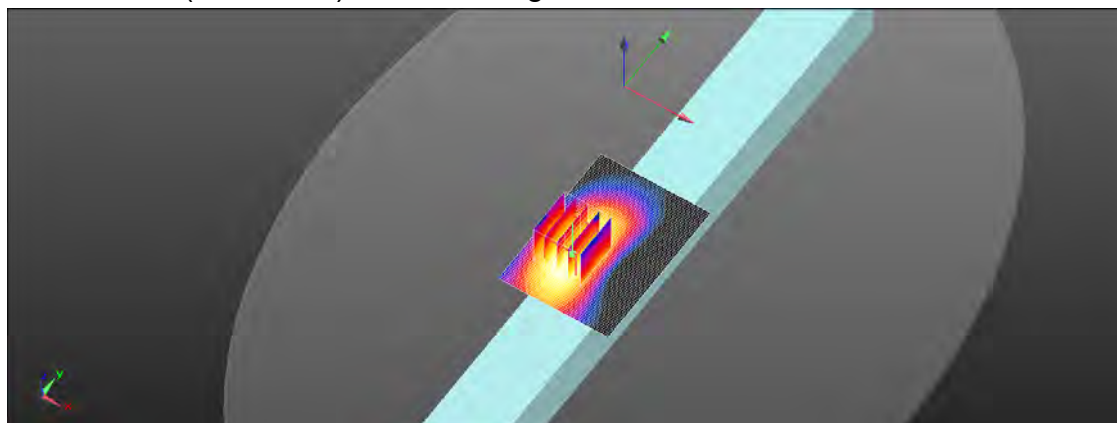
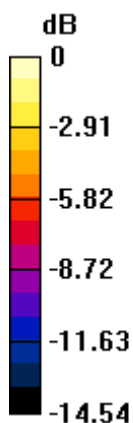
Peak SAR (extrapolated) = 0.637 W/kg

SAR(1 g) = 0.462 W/kg; SAR(10 g) = 0.307 W/kg

Smallest distance from peaks to all points 3 dB below = 11.2 mm

Ratio of SAR at M2 to SAR at M1 = 73.2%

Maximum value of SAR (measured) = 0.560 W/kg



0 dB = 0.560 W/kg = -2.52 dBW/kg

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Date: 2020/12/7

Report No. : ES/2020/70001

LTE Band 2 (20MHz)_Body_Top side_CH 18700_QPSK_1-99_15mm

Communication System: LTE; Frequency: 1860 MHz; Duty cycle= 1:1

Medium parameters used: $f = 1860$ MHz; $\sigma = 1.378$ S/m; $\epsilon_r = 38.342$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 23.0°C; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(8.07, 8.07, 8.07) @ 1860 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- 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) = 1.42 W/kg

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

Reference Value = 20.61 V/m; Power Drift = -0.10 dB

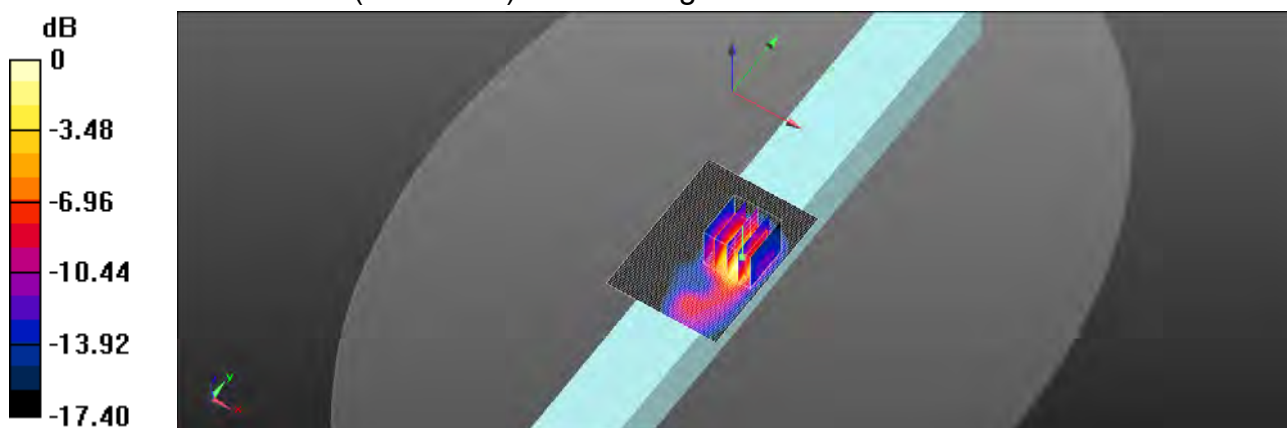
Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.873 W/kg; SAR(10 g) = 0.413 W/kg

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 58.1%

Maximum value of SAR (measured) = 1.22 W/kg



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

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Date: 2020/12/6

Report No. : ES/2020/70001

LTE Band 4 (20MHz)_Body_Top side_CH 20050_QPSK_1-0_15mm

Communication System: LTE; Frequency: 1720 MHz; Duty cycle= 1:1

Medium parameters used: $f = 1720$ MHz; $\sigma = 1.310$ S/m; $\epsilon_r = 38.809$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 21.8°C; Liquid temperature: 23.0°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(8.34, 8.34, 8.34) @ 1720 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- 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) = 0.822 W/kg

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

Reference Value = 10.38 V/m; Power Drift = -0.19 dB

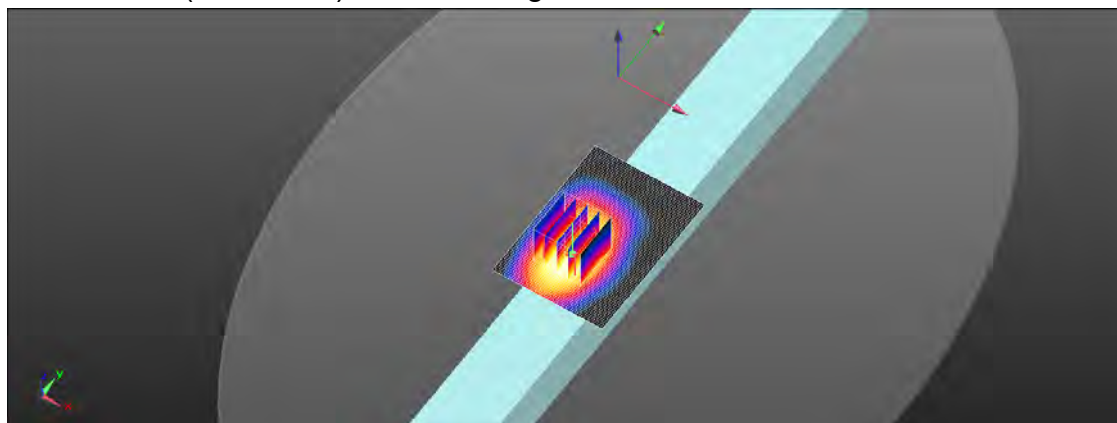
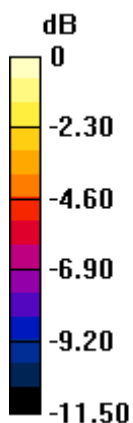
Peak SAR (extrapolated) = 0.889 W/kg

SAR(1 g) = 0.605 W/kg; SAR(10 g) = 0.389 W/kg

Smallest distance from peaks to all points 3 dB below = 14.4 mm

Ratio of SAR at M2 to SAR at M1 = 68.9%

Maximum value of SAR (measured) = 0.750 W/kg



0 dB = 0.750 W/kg = -1.25 dBW/kg

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Date: 2020/12/5

Report No. : ES/2020/70001

LTE Band 5 (10MHz)_Body_Top side_CH 20525_QPSK_1-0_15mm

Communication System: LTE; Frequency: 836.5 MHz; Duty cycle= 1:1

Medium parameters used: $f = 836.5$ MHz; $\sigma = 0.895$ S/m; $\epsilon_r = 41.818$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.5°C; Liquid temperature: 22.6°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(9.73, 9.73, 9.73) @ 836.5 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- 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) = 1.22 W/kg

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

Reference Value = 11.47 V/m; Power Drift = -0.16 dB

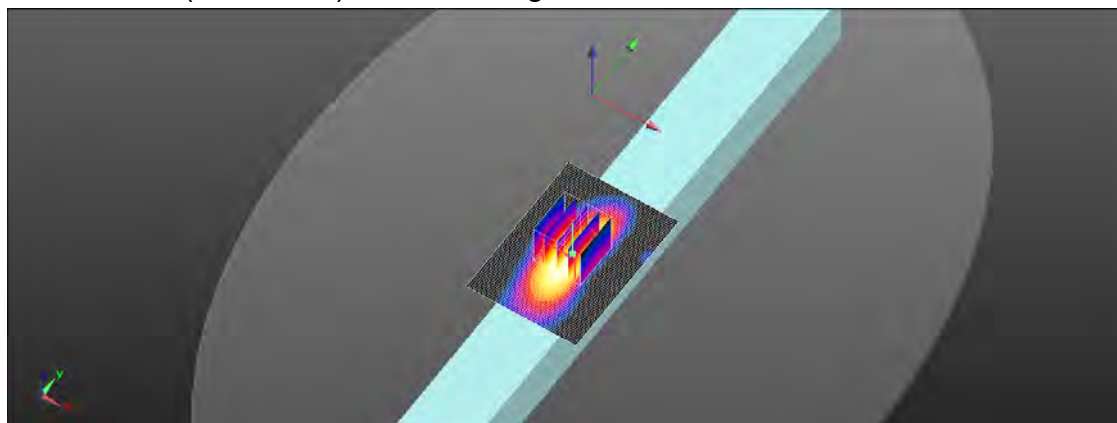
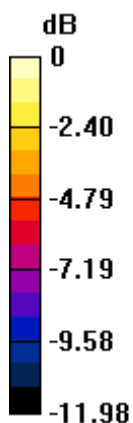
Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.747 W/kg; SAR(10 g) = 0.456 W/kg

Smallest distance from peaks to all points 3 dB below = 11.2 mm

Ratio of SAR at M2 to SAR at M1 = 68%

Maximum value of SAR (measured) = 0.956 W/kg



0 dB = 0.956 W/kg = -0.20 dBW/kg

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Date: 2020/12/5

Report No. : ES/2020/70001

LTE Band 12 (10MHz)_Body_Top side_CH 23060_QPSK_1-25_15mm

Communication System: LTE; Frequency: 704 MHz; Duty cycle= 1:1

Medium parameters used: $f = 704 \text{ MHz}$; $\sigma = 0.848 \text{ S/m}$; $\epsilon_r = 43.441$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient temperature: 22.9°C; Liquid temperature: 23.0°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(9.94, 9.94, 9.94) @ 704 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Area Scan (51x71x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

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

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 30.81 V/m; Power Drift = -0.01 dB

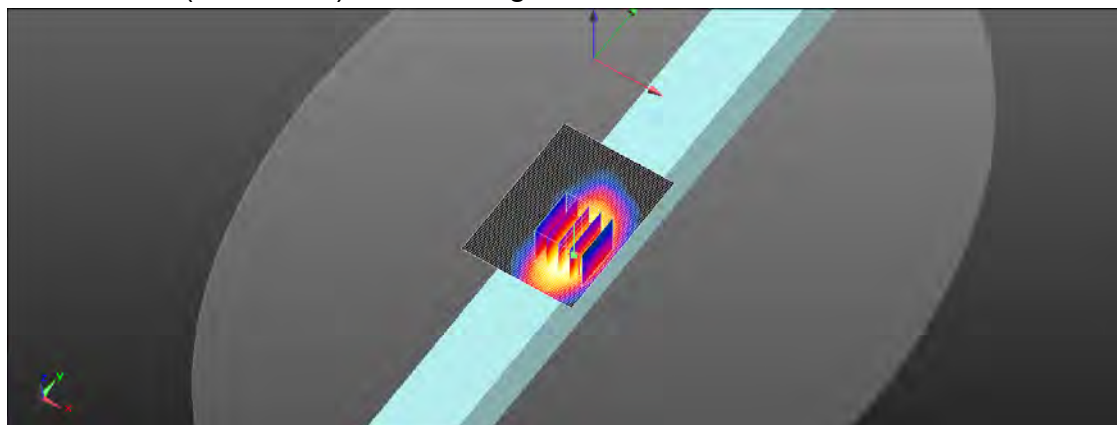
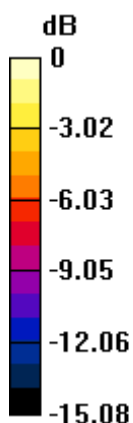
Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.873 W/kg; SAR(10 g) = 0.510 W/kg

Smallest distance from peaks to all points 3 dB below = 11.2 mm

Ratio of SAR at M2 to SAR at M1 = 64.7%

Maximum value of SAR (measured) = 1.16 W/kg



0 dB = 1.16 W/kg = 0.64 dBW/kg

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6. SAR System Performance Verification

Date: 2020/12/5

Report No. : ES/2020/70001

Dipole 750 MHz_SN:1015

Communication System: CW; Frequency: 750 MHz; Duty cycle= 1:1

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.89 \text{ S/m}$; $\epsilon_r = 42.923$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

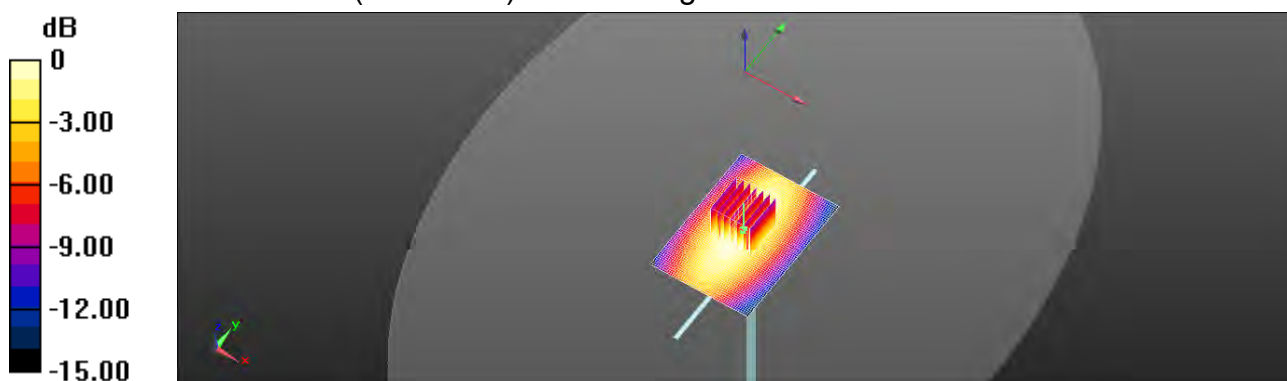
Ambient temperature: 22.9°C ; Liquid temperature: 23.0°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(9.94, 9.94, 9.94) @ 750 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Pin=250mW/Area Scan (51x71x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 4.63 W/kg **Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 76.69 V/m ; Power Drift = 0.06 dB Peak SAR (extrapolated) = 5.50 W/kg **SAR(1 g) = 2.05 W/kg ; SAR(10 g) = 1.49 W/kg**

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 68.3% Maximum value of SAR (measured) = 4.71 W/kg  $0 \text{ dB} = 4.71 \text{ W/kg} = 6.73 \text{ dBW/kg}$

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Date: 2020/12/5

Report No. : ES/2020/70001

Dipole 835 MHz_SN:4d063

Communication System: CW; Frequency: 835 MHz; Duty cycle= 1:1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.891 \text{ S/m}$; $\epsilon_r = 41.862$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient temperature: 22.5°C ; Liquid temperature: 22.6°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(9.73, 9.73, 9.73) @ 835 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Pin=250mW/Area Scan (51x121x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 2.79 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.44 V/m ; Power Drift = -0.01 dB

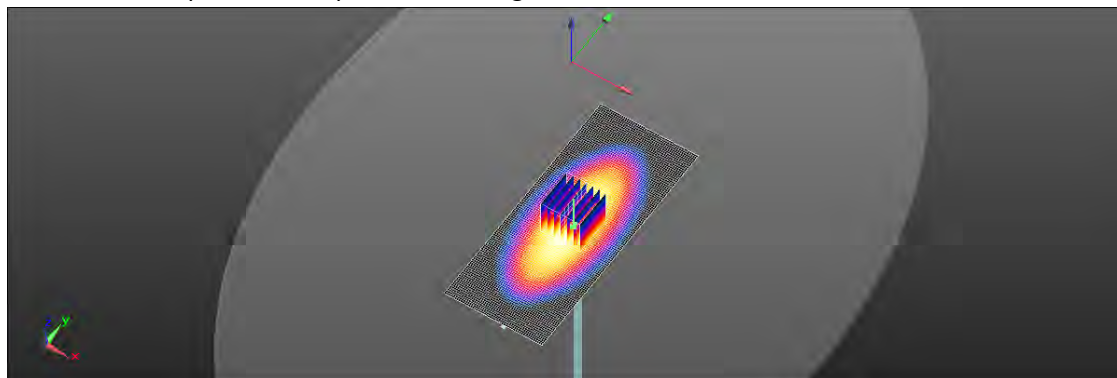
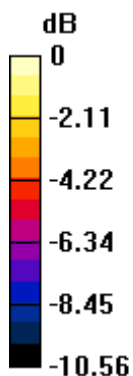
Peak SAR (extrapolated) = 3.33 W/kg

SAR(1 g) = 2.24 W/kg ; SAR(10 g) = 1.46 W/kg

Smallest distance from peaks to all points 3 dB below = 19.4 mm

Ratio of SAR at M2 to SAR at M1 = 67%

Maximum value of SAR (measured) = 2.84 W/kg



0 dB = 2.84 W/kg = 4.53 dBW/kg

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Date: 2020/12/6

Report No. : ES/2020/70001**Dipole 1750 MHz_SN:1008**

Communication System: CW; Frequency: 1750 MHz; Duty cycle= 1:1

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.358$ S/m; $\epsilon_r = 38.741$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 21.8°C; Liquid temperature: 23.0°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(8.34, 8.34, 8.34) @ 1750 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15 mm, dy=15 mm

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

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.41 V/m; Power Drift = 0.04 dB

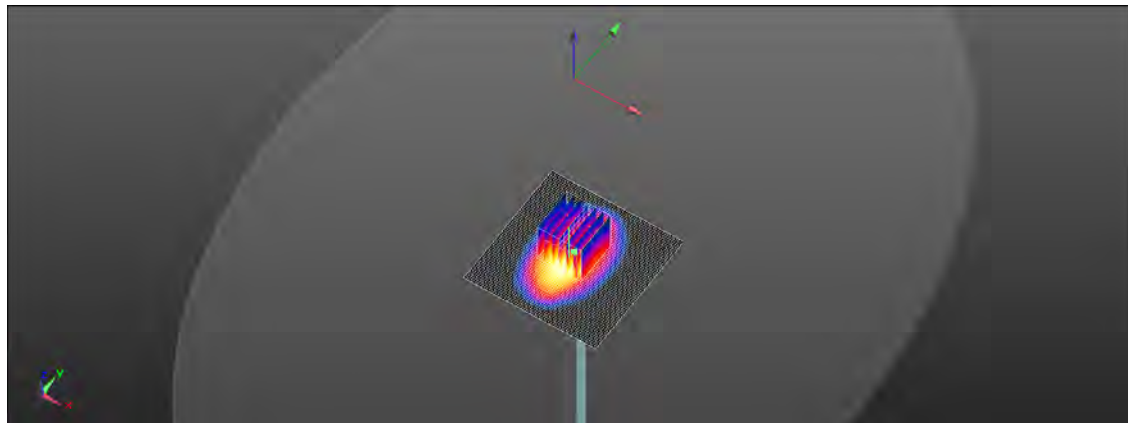
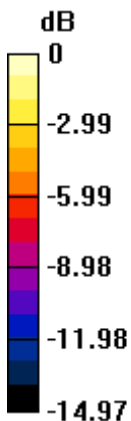
Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 8.36 W/kg; SAR(10 g) = 4.79 W/kg

Smallest distance from peaks to all points 3 dB below = 10.8 mm

Ratio of SAR at M2 to SAR at M1 = 60.1%

Maximum value of SAR (measured) = 12.9 W/kg



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

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Date: 2020/12/7

Report No. : ES/2020/70001

Dipole 1900 MHz_SN:5d173

Communication System: CW; Frequency: 1900 MHz; Duty cycle= 1:1

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.41 \text{ S/m}$; $\epsilon_r = 38.225$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient temperature: 23.0°C ; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7509; ConvF(8.07, 8.07, 8.07) @ 1900 MHz; Calibrated: 2020/03/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn877; Calibrated: 2020/03/17
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Pin=250mW/Area Scan (51x91x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 14.6 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.55 V/m ; Power Drift = -0.13 dB

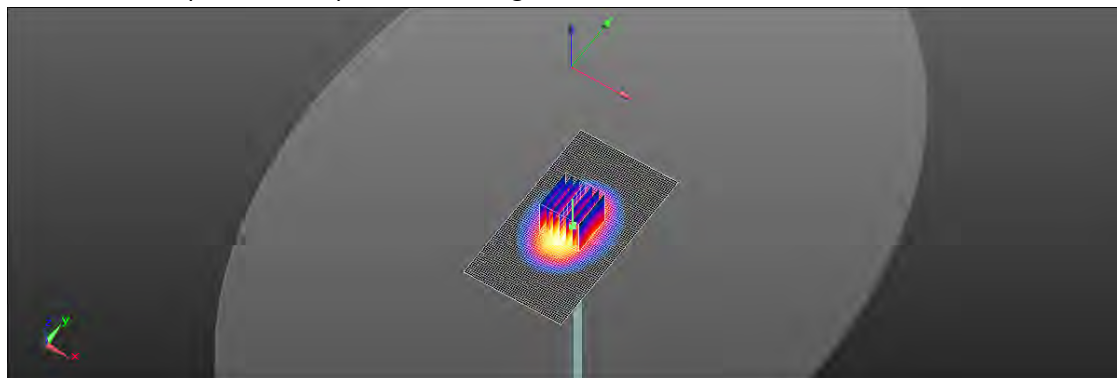
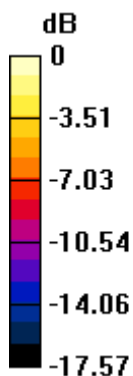
Peak SAR (extrapolated) = 17.7 W/kg

SAR(1 g) = 9.5 W/kg ; SAR(10 g) = 4.92 W/kg

Smallest distance from peaks to all points 3 dB below = 10 mm

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

Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.40 dBW/kg

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7. Uncertainty Budget

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

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
<i>Isotropy , Axial</i>	3.50%	R	$\sqrt{3}$	1.732	1	1	2.02%	2.02%	∞
<i>Isotropy, Hemispherical</i>	9.60%	R	$\sqrt{3}$	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	$\sqrt{3}$	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	$\sqrt{3}$	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	$\sqrt{3}$	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	$\sqrt{3}$	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	$\sqrt{3}$	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	$\sqrt{3}$	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	$\sqrt{3}$	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	$\sqrt{3}$	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	$\sqrt{3}$	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom shell	2.90%	R	$\sqrt{3}$	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	$\sqrt{3}$	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	$\sqrt{3}$	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	$\sqrt{3}$	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	4.63%	N	1	1	0.64	0.43	2.96%	1.99%	M
Liquid Conductivity (mea.)	4.70%	N	1	1	0.6	0.49	2.82%	2.30%	M
Combined standard uncertainty		RSS					12.13%	11.81%	
Expant uncertainty (95% confidence interval), K=2							24.26%	23.61%	

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Appendixes

Refer to separated files for the following appendixes.

ES202070001 SAR_Appendix A Photographs

ES202070001 SAR_Appendix B DAE & Probe Cal. Certificate

ES202070001 SAR_Appendix C Phantom Description & Dipole Cal. Certificate

- End of report -

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