SAR TEST REPORT

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

Equipment Under Test	Smart Phone
Model Name	F-42A
Brand Name	FUJITSU
Company Name	FUJITSU CONNECTED TECHNOLOGIES Ltd.
Company Address	Chuorinkan 7-10-1 Yamato, Kanagawa 242-0007, Japan
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013, KDB248227D01v02r02,KDB865664D01v01r04, KDB865664D02v01r02,KDB941225D01v03r01, KDB941225D06v02r01,KDB447498D01v06, KDB941225D05v02r05
FCC ID	2AQYEFMP178
Date of Receipt	Apr. 1st, 2020
Date of Test(s)	Apr. 17th, 2020 ~ Apr. 23rd, 2020
Date of Issue	Jul. 1st, 2020

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

Remarks:

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

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Electronic & Communication Laboratory or testing done by SGS Taiwan Electronic & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronic & Communication Laboratory in writing.

Signed on behalf of SGS

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

Date: Jul. 1st, 2020

Revision History

Report Number	Revision	Description	Issue Date
E5/2020/40001	Rev.00	Initial creation of document	Jul. 1st, 2020

Contents

1. General Information

1.1 Testing Laboratory

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1.2 Details of Applicant

Company Name	FUJITSU CONNECTED TECHNOLOGIES Ltd.
Company Address	Chuorinkan 7-10-1 Yamato, Kanagawa 242-0007, Japan

1.3 Description of EUT

EUT Name	Smart Phone			
Model Name	F-42A			
Brand Name	FUJITSU			
FCC ID	2AQYEFMP178			
Mode of Operation	☒GSM ☒GPRS ☒WCDMA ☒HSDPA ☒HSUPA ☒LTE FDD ☒ WLAN802.11 a/b/g/n/ac(20M/40M/80M) ☒Bluetooth			
Duty Cycle	GSM (DTM multi class B)	1/8.3		
	GPRS (support multi class 12 max)	1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP) 1/8.3 (1Dn1UP)		
	LTE FDD	1		
	WCDMA	1		
	WLAN802.11 a/b/g/n/ac(20M/40M/80M)	Refer to page 28-30		
	Bluetooth	76.8%		
TX Frequency Range (MHz)	GSM850	824	–	849
	GSM1900	1850	–	1910
	WCDMA Band V	824	–	849
	LTE FDD Band 5	824	–	849
	LTE FDD Band 12	699	–	716
	LTE FDD Band 17	704	–	716
	WiFi 2.4GHz	2400	–	2462
	WiFi 5GHz	5150	–	5725
	Bluetooth	2402	–	2480

Channel Number (ARFCN)	GSM850	128	—	251
	GSM1900	512	—	810
	WCDMA Band V	4132	—	4233
	LTE FDD Band 5	20407	—	20643
	LTE FDD Band 12	23017	—	23173
	LTE FDD Band 17	23755	—	23825
	WiFi 2.4GHz	1	—	11
	WiFi 5GHz	36	—	144
	Bluetooth	0	—	78

WWAN antenna information:

Frequency	GSM850	GSM1900	WCDMA Band V	LTE Band 5	LTE Band 12	LTE Band 17
Gain (dBi)	-3.20	-1.20	-2.90	-2.90	-10.30	-10.30

WLAN / Bluetooth antenna information:

Antenna	**Main (PIFA)**			
Frequency	2.4G	5.2G	5.5G	5.8G
Gain (dBi)	-3.70	-2.30	-2.30	-2.30

Max. SAR (1-g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Head	GSM 850	0.44	0.53	☐Left ☒Right ☒Cheek ☐Tilt 251 Channel
	GSM 1900	0.70	0.84	☒Left ☐Right ☒Cheek ☐Tilt 810 Channel
	WCDMA Band V	0.56	0.61	☐Left ☒Right ☒Cheek ☐Tilt 4233 Channel
	LTE FDD Band 5	0.50	0.60	☐Left ☒Right ☒Cheek ☐Tilt 20600 Channel
	LTE FDD Band 12	0.07	0.08	☐Left ☒Right ☒Cheek ☐Tilt 23130 Channel
	LTE FDD Band 17	0.07	0.09	☐Left ☒Right ☒Cheek ☐Tilt 23800 Channel
	WLAN802.11 b	0.48	0.50	☒Left ☐Right ☒Cheek ☐Tilt 10 Channel
	WLAN802.11a 5.2G	0.29	0.32	☒Left ☐Right ☒Cheek ☐Tilt 36 Channel
	WLAN802.11ac(80M)5.3G	0.20	0.23	☒Left ☐Right ☒Cheek ☐Tilt 58 Channel
	WLAN802.11ac(80M)5.6G	0.21	0.23	☒Left ☐Right ☒Cheek ☐Tilt 106 Channel
	Bluetooth	0.08	0.11	☒Left ☐Right ☒Cheek ☐Tilt 78 Channel

Max. SAR (1-g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Body-worn	GSM 850	0.50	0.60	☐Front ☒Back 251 Channel
	GSM 1900	0.54	0.64	☐Front ☒Back 810 Channel
	Bluetooth	0.04	0.05	☐Front ☒Back 78 Channel
	WLAN802.11a 5.2G	0.15	0.17	☐Front ☒Back 36 Channel
	WLAN802.11ac(80M)5.3G	0.10	0.11	☐Front ☒Back 58 Channel
	WLAN802.11ac(80M)5.6G	0.17	0.20	☐Front ☒Back 106 Channel

Max. SAR (1-g) (Unit: W/Kg)				
Mode	Band	Measured	Reported	Position / Channel
Hotspot mode	GPRS 850 (1Dn4UP)	0.57	0.63	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 251 Channel
	GPRS 1900 (1Dn2UP)	0.59	0.65	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 661 Channel
	WCDMA Band V	0.56	0.61	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 4132 Channel
	LTE FDD Band 5	0.59	0.72	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 20600 Channel
	LTE FDD Band 12	0.12	0.14	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 23130 Channel
	LTE FDD Band 17	0.13	0.15	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 23800 Channel
	WLAN802.11 b	0.07	0.08	☐Front ☒Back ☐Top ☐Right ☐Left ☐Bottom 10 Channel

Highest simultaneous SAR (1-g) (Unit: W/Kg)	
Head	1.342
Body	0.910

GSM 850 - conducted power table:

EUT mode	Frequency (MHz)	CH	Max. Rated Avg.Power + Max.Tolerance (dBm)	Burst average power	Source-based time average power
				Avg. (dBm)	Avg. (dBm)
GSM 850 (GMSK)	824.2	128	33	32.51	23.48
	836.6	190	33	32.45	23.42
	848.8	251	33	32.17	23.14
The division factor compared to the number of TX time slot					
Division factor				1 TX time slot	
				-9.03	

GPRS 850 - conducted power table:

Burst average power						
Max. Rated Avg. Power + Max. Tolerance (dBm)			33.00	31.00	29.50	28.50
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	CH	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 850	824.2	128	32.51	30.87	29.13	27.83
	836.6	190	32.45	30.89	29.21	27.89
	848.8	251	32.17	30.86	29.28	28.07
Source-based time average power						
GPRS 850	824.2	128	23.48	24.85	24.87	24.82
	836.6	190	23.42	24.87	24.95	24.88
	848.8	251	23.14	24.84	25.02	25.06
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

GSM 1900 - conducted power table:

EUT mode	Frequency (MHz)	CH	Max. Rated Avg. Power + Max.Tolerance (dBm)	Burst average power	Source-based time average power
				Avg. (dBm)	Avg. (dBm)
GSM1900 (GMSK)	1850.2	512	30	29.46	20.43
	1800	661	30	29.56	20.53
	1909.8	810	30	29.23	20.20
The division factor compared to the number of TX time slot					
Division factor				1 TX time slot	
				-9.03	

GPRS 1900 - conducted power table:

Burst average power						
Max. Rated Avg. Power + Max. Tolerance (dBm)			30.00	27.50	25.50	24.00
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP
EUT mode	Frequency (MHz)	CH	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)	Avg. (dBm)
GPRS 1900	1850.2	512	29.46	27.03	25.26	23.88
	1880	661	29.56	27.08	25.28	23.99
	1909.8	810	29.23	27.07	25.20	23.97
Source-based time average power						
GPRS 1900	1850.2	512	20.43	21.01	21.00	20.87
	1880	661	20.53	21.06	21.02	20.98
	1909.8	810	20.20	21.05	20.94	20.96
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot
			-9.03	-6.02	-4.26	-3.01

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

Band		WCDMA V		
TX Channel		4132	4183	4233
Frequency (MHz)		826.4	836.6	846.6
Max. Rated Avg. Power+Max. Tolerance (dBm)			**24.00**	
3GPP Rel 99	RMC 12.2Kbps	23.60	23.50	23.56
3GPP Rel 5	HSDPA Subtest-1	22.46	22.50	22.62
	HSDPA Subtest-2	22.07	21.99	22.15
	HSDPA Subtest-3	21.99	22.00	22.17
	HSDPA Subtest-4	21.97	21.99	22.17
3GPP Rel 6	HSUPA Subtest-1	22.53	22.56	22.72
	HSUPA Subtest-2	20.43	20.45	20.69
	HSUPA Subtest-3	21.45	21.46	21.62
	HSUPA Subtest-4	20.54	20.56	20.69
	HSUPA Subtest-5	22.53	22.52	22.68

Subtests for WCDMA Release 5 HSDPA

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

Subtests for WCDMA Release 6 HSUPA

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

LTE Band 5 / Band 12 / Band 17 - conducted power table:

FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	829	20450	22.88	24	0
				836.5	20525	22.87	24	0
				844	20600	22.97	24	0
			25	829	20450	23.19	24	0
				836.5	20525	23.61	24	0
				844	20600	23.18	24	0
			49	829	20450	22.90	24	0
				836.5	20525	22.86	24	0
				844	20600	23.00	24	0
		25 RB	0	829	20450	22.07	23	0-1
				836.5	20525	22.10	23	0-1
				844	20600	22.26	23	0-1
			12	829	20450	22.10	23	0-1
				836.5	20525	22.17	23	0-1
				844	20600	22.24	23	0-1
			25	829	20450	22.14	23	0-1
				836.5	20525	22.24	23	0-1
				844	20600	22.20	23	0-1
		50RB		829	20450	22.11	23	0-1
				836.5	20525	22.12	23	0-1
				844	20600	22.17	23	0-1
	16-QAM	1 RB	0	829	20450	22.14	23	0-1
				836.5	20525	22.12	23	0-1
				844	20600	21.90	23	0-1
			25	829	20450	21.92	23	0-1
				836.5	20525	22.11	23	0-1
				844	20600	21.99	23	0-1
			49	829	20450	21.90	23	0-1
				836.5	20525	21.85	23	0-1
				844	20600	21.62	23	0-1
		25 RB	0	829	20450	21.22	22	0-2
				836.5	20525	21.26	22	0-2
				844	20600	21.28	22	0-2
			12	829	20450	21.30	22	0-2
				836.5	20525	21.23	22	0-2
				844	20600	21.46	22	0-2
			25	829	20450	21.12	22	0-2
				836.5	20525	21.27	22	0-2
				844	20600	20.99	22	0-2
		500RB		829	20450	21.09	22	0-2
				836.5	20525	20.98	22	0-2
				844	20600	21.09	22	0-2

FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	826.5	20425	22.62	24	0
				836.5	20525	22.79	24	0
				846.5	20625	22.75	24	0
			12	826.5	20425	23.17	24	0
				836.5	20525	23.59	24	0
				846.5	20625	23.31	24	0
			24	826.5	20425	22.66	24	0
				836.5	20525	22.99	24	0
				846.5	20625	22.87	24	0
		12 RB	0	826.5	20425	22.11	23	0-1
				836.5	20525	22.09	23	0-1
				846.5	20625	22.11	23	0-1
			6	826.5	20425	22.21	23	0-1
				836.5	20525	22.19	23	0-1
				846.5	20625	22.14	23	0-1
			13	826.5	20425	22.10	23	0-1
				836.5	20525	22.10	23	0-1
				846.5	20625	22.09	23	0-1
		25RB		826.5	20425	22.13	23	0-1
				836.5	20525	22.16	23	0-1
				846.5	20625	22.05	23	0-1
	16-QAM	1 RB	0	826.5	20425	21.60	23	0-1
				836.5	20525	21.50	23	0-1
				846.5	20625	22.02	23	0-1
			12	826.5	20425	21.65	23	0-1
				836.5	20525	21.82	23	0-1
				846.5	20625	21.74	23	0-1
			24	826.5	20425	21.76	23	0-1
				836.5	20525	22.09	23	0-1
				846.5	20625	21.67	23	0-1
		12 RB	0	826.5	20425	20.98	22	0-2
				836.5	20525	20.93	22	0-2
				846.5	20625	20.88	22	0-2
			6	826.5	20425	21.12	22	0-2
				836.5	20525	21.00	22	0-2
				846.5	20625	21.07	22	0-2
			13	826.5	20425	21.02	22	0-2
				836.5	20525	21.02	22	0-2
				846.5	20625	20.96	22	0-2
		25RB		826.5	20425	21.29	22	0-2
				836.5	20525	21.09	22	0-2
				846.5	20625	21.08	22	0-2

FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	825.5	20415	23.06	24	0
				836.5	20525	22.98	24	0
				847.5	20635	22.90	24	0
			7	825.5	20415	23.03	24	0
				836.5	20525	23.14	24	0
				847.5	20635	22.92	24	0
			14	825.5	20415	22.98	24	0
				836.5	20525	23.04	24	0
				847.5	20635	22.79	24	0
		8 RB	0	825.5	20415	22.31	23	0-1
				836.5	20525	22.19	23	0-1
				847.5	20635	22.01	23	0-1
			4	825.5	20415	22.14	23	0-1
				836.5	20525	22.21	23	0-1
				847.5	20635	22.18	23	0-1
			7	825.5	20415	22.25	23	0-1
				836.5	20525	22.16	23	0-1
				847.5	20635	22.13	23	0-1
		15RB		825.5	20415	22.14	23	0-1
				836.5	20525	22.15	23	0-1
				847.5	20635	22.15	23	0-1
	16-QAM	1 RB	0	825.5	20415	21.68	23	0-1
				836.5	20525	21.72	23	0-1
				847.5	20635	21.90	23	0-1
			7	825.5	20415	21.80	23	0-1
				836.5	20525	21.73	23	0-1
				847.5	20635	21.72	23	0-1
			14	825.5	20415	21.62	23	0-1
				836.5	20525	21.68	23	0-1
				847.5	20635	21.99	23	0-1
		8 RB	0	825.5	20415	21.27	22	0-2
				836.5	20525	21.12	22	0-2
				847.5	20635	21.08	22	0-2
			4	825.5	20415	21.04	22	0-2
				836.5	20525	21.15	22	0-2
				847.5	20635	21.33	22	0-2
			7	825.5	20415	21.26	22	0-2
				836.5	20525	21.20	22	0-2
				847.5	20635	21.17	22	0-2
		15RB		825.5	20415	20.73	22	0-2
				836.5	20525	20.94	22	0-2
				847.5	20635	21.17	22	0-2

FDD Band 5								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	824.7	20407	23.08	24	0
				836.5	20525	23.19	24	0
				848.3	20643	23.04	24	0
			2	824.7	20407	23.22	24	0
				836.5	20525	23.27	24	0
				848.3	20643	23.20	24	0
			5	824.7	20407	23.19	24	0
				836.5	20525	23.07	24	0
				848.3	20643	23.11	24	0
		3 RB	0	824.7	20407	22.96	23	0-1
				836.5	20525	22.73	23	0-1
				848.3	20643	22.66	23	0-1
			2	824.7	20407	22.63	23	0-1
				836.5	20525	22.77	23	0-1
				848.3	20643	22.70	23	0-1
			3	824.7	20407	22.82	23	0-1
				836.5	20525	22.81	23	0-1
				848.3	20643	22.64	23	0-1
		6RB		824.7	20407	22.09	23	0-1
				836.5	20525	22.20	23	0-1
				848.3	20643	22.09	23	0-1
	16-QAM	1 RB	0	824.7	20407	21.86	23	0-1
				836.5	20525	22.24	23	0-1
				848.3	20643	21.62	23	0-1
			2	824.7	20407	22.16	23	0-1
				836.5	20525	21.70	23	0-1
				848.3	20643	21.72	23	0-1
			5	824.7	20407	21.76	23	0-1
				836.5	20525	21.54	23	0-1
				848.3	20643	21.92	23	0-1
		3 RB	0	824.7	20407	21.95	22	0-2
				836.5	20525	21.54	22	0-2
				848.3	20643	21.49	22	0-2
			2	824.7	20407	21.69	22	0-2
				836.5	20525	21.64	22	0-2
				848.3	20643	21.77	22	0-2
			3	824.7	20407	21.55	22	0-2
				836.5	20525	21.99	22	0-2
				848.3	20643	21.66	22	0-2
		6RB		824.7	20407	20.93	22	0-2
				836.5	20525	21.10	22	0-2
				848.3	20643	20.93	22	0-2

FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	704	23060	22.87	24	0
				707.5	23095	22.80	24	0
				711	23130	23.12	24	0
			25	704	23060	23.72	24	0
				707.5	23095	23.39	24	0
				711	23130	23.48	24	0
			49	704	23060	23.38	24	0
				707.5	23095	23.28	24	0
				711	23130	22.94	24	0
		25 RB	0	704	23060	22.20	23	0-1
				707.5	23095	22.38	23	0-1
				711	23130	22.35	23	0-1
			12	704	23060	22.34	23	0-1
				707.5	23095	22.41	23	0-1
				711	23130	22.40	23	0-1
			25	704	23060	22.44	23	0-1
				707.5	23095	22.33	23	0-1
				711	23130	22.33	23	0-1
		50RB		704	23060	22.35	23	0-1
				707.5	23095	22.43	23	0-1
				711	23130	22.23	23	0-1
	16-QAM	1 RB	0	704	23060	21.70	23	0-1
				707.5	23095	21.83	23	0-1
				711	23130	22.01	23	0-1
			25	704	23060	22.29	23	0-1
				707.5	23095	22.33	23	0-1
				711	23130	22.23	23	0-1
			49	704	23060	22.39	23	0-1
				707.5	23095	22.38	23	0-1
				711	23130	21.73	23	0-1
		25 RB	0	704	23060	21.21	22	0-2
				707.5	23095	21.48	22	0-2
				711	23130	21.53	22	0-2
			12	704	23060	21.17	22	0-2
				707.5	23095	21.42	22	0-2
				711	23130	21.52	22	0-2
			25	704	23060	21.43	22	0-2
				707.5	23095	21.24	22	0-2
				711	23130	21.44	22	0-2
		500RB		704	23060	21.38	22	0-2
				707.5	23095	21.43	22	0-2
				711	23130	21.28	22	0-2

FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	701.5	23035	22.95	24	0
				707.5	23095	22.83	24	0
				713.5	23155	22.77	24	0
			12	701.5	23035	23.24	24	0
				707.5	23095	23.48	24	0
				713.5	23155	23.48	24	0
			24	701.5	23035	22.99	24	0
				707.5	23095	23.11	24	0
				713.5	23155	22.83	24	0
		12 RB	0	701.5	23035	22.39	23	0-1
				707.5	23095	22.32	23	0-1
				713.5	23155	22.23	23	0-1
			6	701.5	23035	22.39	23	0-1
				707.5	23095	22.42	23	0-1
				713.5	23155	22.33	23	0-1
			13	701.5	23035	22.23	23	0-1
				707.5	23095	22.33	23	0-1
				713.5	23155	22.27	23	0-1
		25RB		701.5	23035	22.22	23	0-1
				707.5	23095	22.34	23	0-1
				713.5	23155	22.24	23	0-1
	16-QAM	1 RB	0	701.5	23035	21.80	23	0-1
				707.5	23095	21.88	23	0-1
				713.5	23155	21.88	23	0-1
			12	701.5	23035	22.30	23	0-1
				707.5	23095	22.03	23	0-1
				713.5	23155	21.60	23	0-1
			24	701.5	23035	22.33	23	0-1
				707.5	23095	21.87	23	0-1
				713.5	23155	22.28	23	0-1
		12 RB	0	701.5	23035	21.23	22	0-2
				707.5	23095	21.32	22	0-2
				713.5	23155	21.06	22	0-2
			6	701.5	23035	21.42	22	0-2
				707.5	23095	21.54	22	0-2
				713.5	23155	21.33	22	0-2
			13	701.5	23035	21.06	22	0-2
				707.5	23095	21.36	22	0-2
				713.5	23155	21.13	22	0-2
		25RB		701.5	23035	21.27	22	0-2
				707.5	23095	21.30	22	0-2
				713.5	23155	21.34	22	0-2

FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
3	QPSK	1 RB	0	700.5	23025	23.11	24	0
				707.5	23095	23.10	24	0
				714.5	23165	23.03	24	0
			7	700.5	23025	23.20	24	0
				707.5	23095	23.41	24	0
				714.5	23165	23.37	24	0
			14	700.5	23025	23.13	24	0
				707.5	23095	23.25	24	0
				714.5	23165	23.16	24	0
		8 RB	0	700.5	23025	22.52	23	0-1
				707.5	23095	22.48	23	0-1
				714.5	23165	22.29	23	0-1
			4	700.5	23025	22.42	23	0-1
				707.5	23095	22.42	23	0-1
				714.5	23165	22.41	23	0-1
			7	700.5	23025	22.42	23	0-1
				707.5	23095	22.38	23	0-1
				714.5	23165	22.44	23	0-1
		15RB		700.5	23025	22.40	23	0-1
				707.5	23095	22.37	23	0-1
				714.5	23165	22.29	23	0-1
	16-QAM	1 RB	0	700.5	23025	22.45	23	0-1
				707.5	23095	22.47	23	0-1
				714.5	23165	22.14	23	0-1
			7	700.5	23025	22.23	23	0-1
				707.5	23095	22.39	23	0-1
				714.5	23165	22.28	23	0-1
			14	700.5	23025	22.11	23	0-1
				707.5	23095	21.95	23	0-1
				714.5	23165	22.45	23	0-1
		8 RB	0	700.5	23025	21.41	22	0-2
				707.5	23095	21.43	22	0-2
				714.5	23165	21.57	22	0-2
			4	700.5	23025	21.51	22	0-2
				707.5	23095	21.47	22	0-2
				714.5	23165	21.37	22	0-2
			7	700.5	23025	21.56	22	0-2
				707.5	23095	21.65	22	0-2
				714.5	23165	21.50	22	0-2
		15RB		700.5	23025	21.33	22	0-2
				707.5	23095	21.39	22	0-2
				714.5	23165	21.30	22	0-2

FDD Band 12								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
1.4	QPSK	1 RB	0	699.7	23017	23.41	24	0
				707.5	23095	23.33	24	0
				715.3	23173	23.27	24	0
			2	699.7	23017	23.51	24	0
				707.5	23095	23.34	24	0
				715.3	23173	23.37	24	0
			5	699.7	23017	23.41	24	0
				707.5	23095	23.36	24	0
				715.3	23173	23.35	24	0
		3 RB	0	699.7	23017	22.74	23	0-1
				707.5	23095	22.86	23	0-1
				715.3	23173	22.68	23	0-1
			2	699.7	23017	22.80	23	0-1
				707.5	23095	23.00	23	0-1
				715.3	23173	22.71	23	0-1
			3	699.7	23017	22.86	23	0-1
				707.5	23095	22.75	23	0-1
				715.3	23173	22.83	23	0-1
		6RB		699.7	23017	22.37	23	0-1
				707.5	23095	22.37	23	0-1
				715.3	23173	22.31	23	0-1
	16-QAM	1 RB	0	699.7	23017	22.51	23	0-1
				707.5	23095	22.06	23	0-1
				715.3	23173	22.40	23	0-1
			2	699.7	23017	22.19	23	0-1
				707.5	23095	21.96	23	0-1
				715.3	23173	22.22	23	0-1
			5	699.7	23017	22.17	23	0-1
				707.5	23095	21.85	23	0-1
				715.3	23173	22.10	23	0-1
		3 RB	0	699.7	23017	21.95	22	0-2
				707.5	23095	21.81	22	0-2
				715.3	23173	21.86	22	0-2
			2	699.7	23017	21.94	22	0-2
				707.5	23095	21.93	22	0-2
				715.3	23173	21.99	22	0-2
			3	699.7	23017	21.99	22	0-2
				707.5	23095	21.76	22	0-2
				715.3	23173	21.92	22	0-2
		6RB		699.7	23017	21.27	22	0-2
				707.5	23095	21.19	22	0-2
				715.3	23173	21.26	22	0-2

FDD Band 17								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
10	QPSK	1 RB	0	709	23780	22.92	24	0
				710	23790	22.75	24	0
				711	23800	22.71	24	0
			25	709	23780	23.29	24	0
				710	23790	23.43	24	0
				711	23800	23.15	24	0
			49	709	23780	22.91	24	0
				710	23790	22.81	24	0
				711	23800	23.22	24	0
		25 RB	0	709	23780	22.36	23	0-1
				710	23790	22.18	23	0-1
				711	23800	22.15	23	0-1
			12	709	23780	22.15	23	0-1
				710	23790	22.20	23	0-1
				711	23800	22.27	23	0-1
			25	709	23780	22.32	23	0-1
				710	23790	22.30	23	0-1
				711	23800	22.17	23	0-1
		50RB		709	23780	22.34	23	0-1
				710	23790	22.19	23	0-1
				711	23800	22.17	23	0-1
	16-QAM	1 RB	0	709	23780	21.82	23	0-1
				710	23790	21.76	23	0-1
				711	23800	22.16	23	0-1
			25	709	23780	22.45	23	0-1
				710	23790	22.42	23	0-1
				711	23800	21.91	23	0-1
			49	709	23780	22.26	23	0-1
				710	23790	21.71	23	0-1
				711	23800	22.13	23	0-1
		25 RB	0	709	23780	21.35	22	0-2
				710	23790	21.18	22	0-2
				711	23800	21.20	22	0-2
			12	709	23780	21.19	22	0-2
				710	23790	21.32	22	0-2
				711	23800	21.25	22	0-2
			25	709	23780	21.66	22	0-2
				710	23790	21.27	22	0-2
				711	23800	21.12	22	0-2
		500RB		709	23780	21.34	22	0-2
				710	23790	21.35	22	0-2
				711	23800	21.17	22	0-2

FDD Band 17								
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allowed per 3GPP(dB)
5	QPSK	1 RB	0	706.5	23755	22.72	24	0
				710	23790	22.75	24	0
				713.5	23825	22.68	24	0
			12	706.5	23755	23.26	24	0
				710	23790	23.42	24	0
				713.5	23825	23.40	24	0
			24	706.5	23755	22.70	24	0
				710	23790	22.85	24	0
				713.5	23825	22.83	24	0
		12 RB	0	706.5	23755	22.22	23	0-1
				710	23790	22.02	23	0-1
				713.5	23825	22.14	23	0-1
			6	706.5	23755	22.29	23	0-1
				710	23790	22.05	23	0-1
				713.5	23825	22.14	23	0-1
			13	706.5	23755	22.27	23	0-1
				710	23790	22.19	23	0-1
				713.5	23825	22.08	23	0-1
		25RB		706.5	23755	22.27	23	0-1
				710	23790	22.15	23	0-1
				713.5	23825	22.07	23	0-1
	16-QAM	1 RB	0	706.5	23755	21.87	23	0-1
				710	23790	21.95	23	0-1
				713.5	23825	21.66	23	0-1
			12	706.5	23755	21.83	23	0-1
				710	23790	21.57	23	0-1
				713.5	23825	21.62	23	0-1
			24	706.5	23755	21.67	23	0-1
				710	23790	21.89	23	0-1
				713.5	23825	21.71	23	0-1
		12 RB	0	706.5	23755	21.18	22	0-2
				710	23790	21.02	22	0-2
				713.5	23825	20.90	22	0-2
			6	706.5	23755	21.10	22	0-2
				710	23790	21.04	22	0-2
				713.5	23825	21.03	22	0-2
			13	706.5	23755	21.06	22	0-2
				710	23790	21.05	22	0-2
				713.5	23825	21.01	22	0-2
		25RB		706.5	23755	21.23	22	0-2
				710	23790	21.29	22	0-2
				713.5	23825	21.37	22	0-2

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

Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2450 MHz	802.11b	1	2412	1Mbps	15.50	15.04
		6	2437		15.00	14.91
		10	2457		16.00	15.81
	802.11g	1	2412	6Mbps	15.00	14.89
		6	2437		15.00	14.73
		10	2457		16.00	15.82
	802.11n-HT20	1	2412	MCS0	15.00	14.75
		6	2437		15.00	14.77
		10	2457		16.00	15.92

Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.15-5.25 GHz	802.11a	36	5180	6Mbps	11.50	11.21
		44	5220		11.50	11.14
		48	5240		11.50	11.16
	802.11n-HT20	36	5180	MCS0	11.50	11.25
		44	5220		11.50	11.15
		48	5240		11.50	11.23
	802.11n-VHT20	36	5180	MCS0	11.50	11.21
		44	5220		11.50	11.14
		48	5240		11.50	11.16
	802.11n-HT40	38	5190	MCS0	11.00	10.92
		46	5230		11.00	10.89
	802.11n-VHT40	38	5190	MCS0	10.00	9.73
		46	5230		10.00	9.75
	802.11n-VHT80	42	5210	MCS0	11.00	10.71

Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.25-5.35 GHz	802.11a	52	5260	6Mbps	11.50	11.18
		60	5300		11.50	11.05
		64	5320		11.00	10.96
	802.11n-HT20	52	5260	MCS0	11.50	11.19
		60	5300		11.50	11.18
		64	5320		11.50	11.05
	802.11n-VHT20	52	5260	MCS0	11.50	11.12
		60	5300		11.00	11.00
		64	5320		11.00	10.95
	802.11n-HT40	54	5270	MCS0	11.00	10.80
		62	5310		11.00	10.75
	802.11n-VHT40	54	5270	MCS0	10.00	9.63
		62	5310		10.00	9.53
	802.11n-VHT80	58	5290	MCS0	11.50	11.02

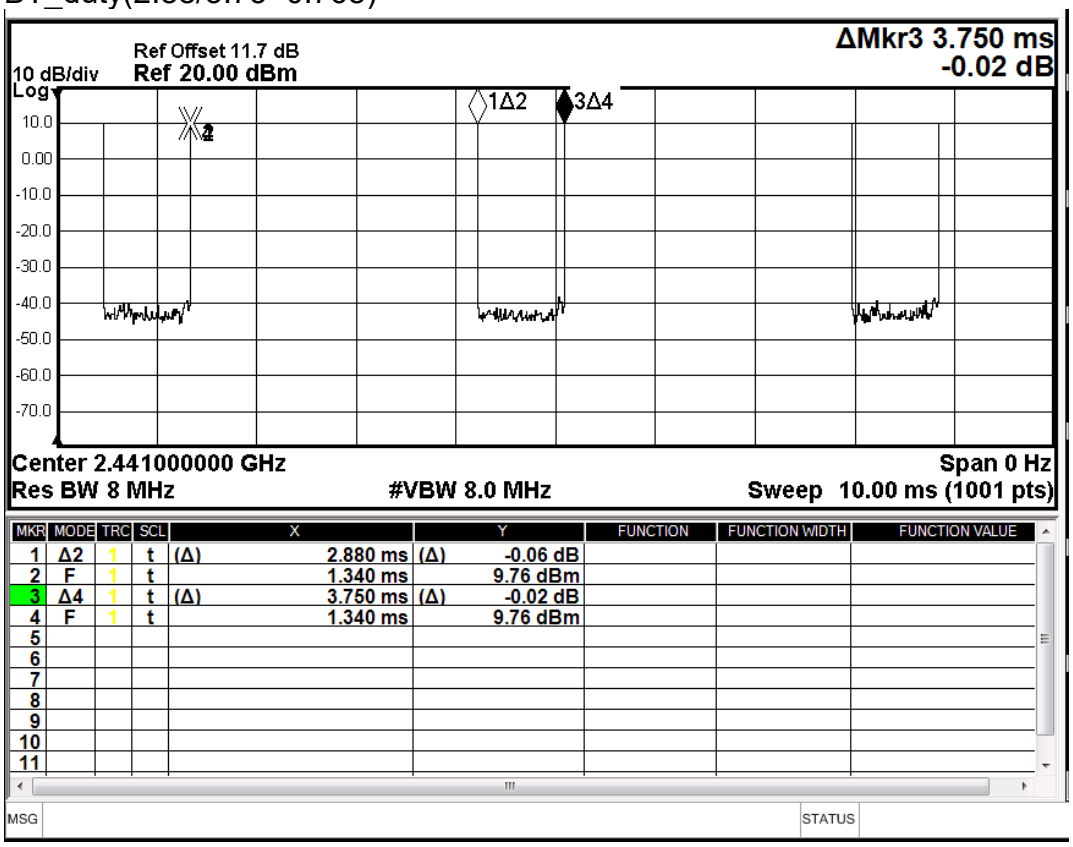
Main Antenna						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5600 GHz	802.11a	100	5500	6Mbps	11.50	11.04
		116	5580		11.00	10.94
		140	5700		11.00	10.84
		144	5720		11.00	10.91
	802.11n-HT20	100	5500	MCS0	11.00	11.00
		116	5580		11.50	11.03
		140	5700		11.00	10.87
		144	5720		11.00	10.97
	802.11n-VHT20	100	5500	MCS0	11.00	10.93
		116	5580		11.00	10.96
		140	5700		11.00	10.85
		144	5720		11.00	10.82
	802.11n-HT40	102	5510	MCS0	11.00	10.65
		110	5550		11.00	10.63
		134	5670		11.50	11.07
		142	5710		11.50	11.03
	802.11n-VHT40	102	5510	MCS0	11.00	10.52
		110	5550		11.00	10.54
		134	5670		11.50	11.02
		142	5710		11.50	11.02
	802.11n-VHT80	106	5530	MCS0	11.50	11.04
		122	5610	MCS0	11.00	11.00
		138	5690	MCS0	11.00	10.97

Bluetooth maximum power table:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)			Max. Rated Avg. Power + Max. Tolerance (dBm)
			1Mbps	2Mbps	3Mbps	
BR/EDR	CH 00	2402	10.10	9.10	8.86	10.5
	CH 39	2441	10.14	8.48	8.25	
	CH 78	2480	10.27	8.49	8.27	

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Max. Rated Avg. Power + Max. Tolerance (dBm)
			GFSK	
LE	CH 00	2402	1.20	1.5
	CH 20	2442	0.40	
	CH 39	2480	0.69	

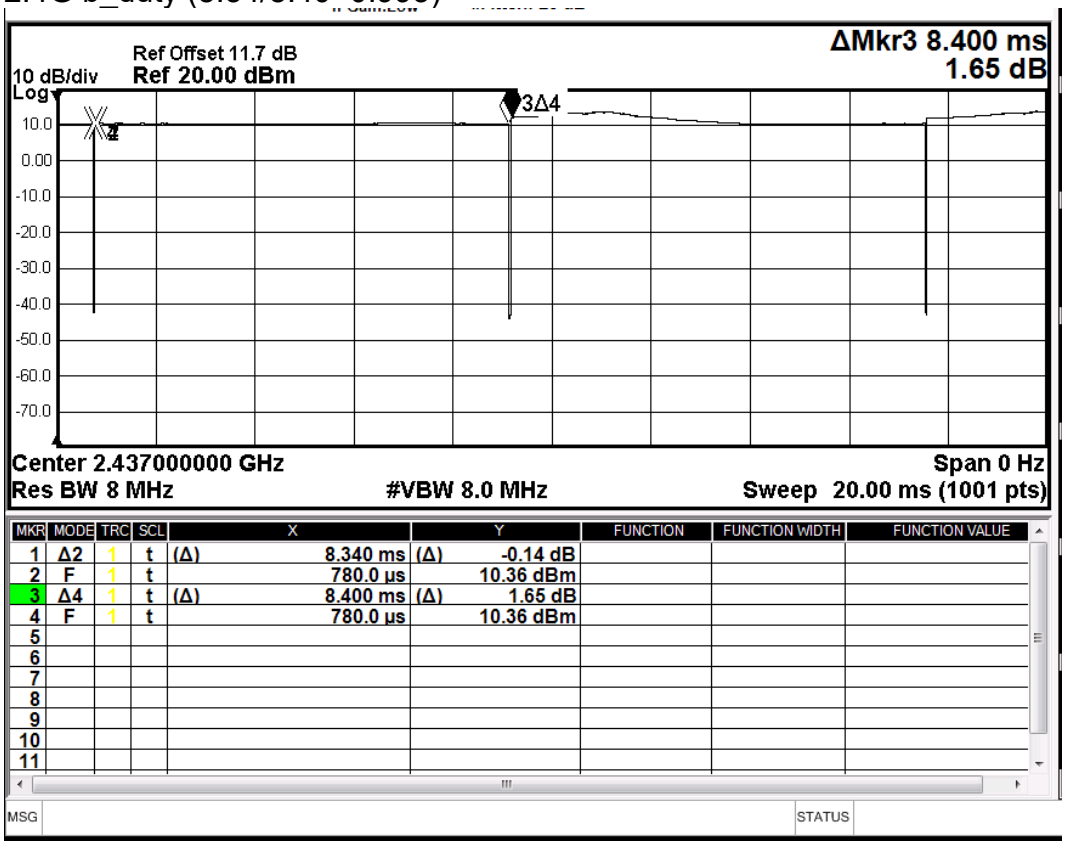
BT_duty(2.88/3.75=0.768)



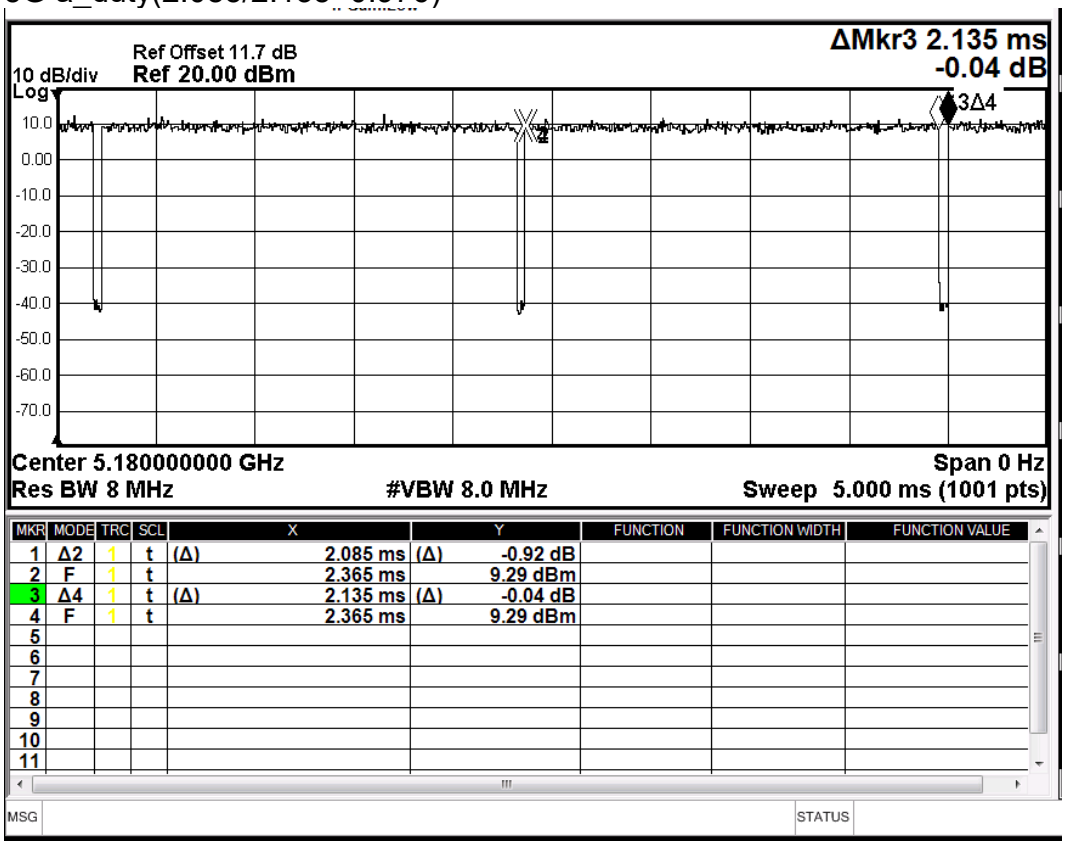
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	1	t	(Δ) 2.880 ms	(Δ) -0.06 dB			
2	F	1	t	1.340 ms	9.76 dBm			
3	Δ4	1	t	(Δ) 3.750 ms	(Δ) -0.02 dB			
4	F	1	t	1.340 ms	9.76 dBm			
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

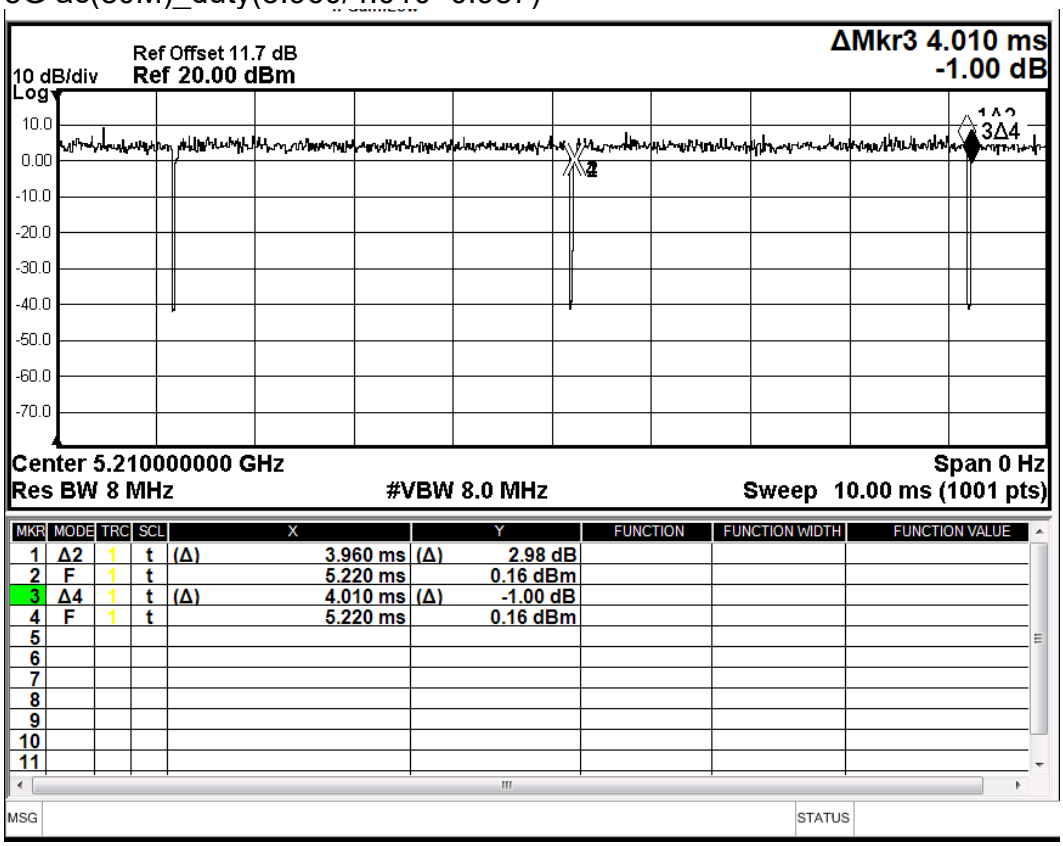
2.4G b_duty (8.34/8.40=0.993)



5G a_duty(2.085/2.135=0.976)



5G ac(80M)_duty(3.960/4.010=0.987)



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	1	t	(Δ) 3.960 ms	(Δ) 2.98 dB			
2	F	1	t	5.220 ms	0.16 dBm			
3	Δ4	1	t	(Δ) 4.010 ms	(Δ) -1.00 dB			
4	F	1	t	5.220 ms	0.16 dBm			
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

1.4 Test Environment

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

1.5 Operation Description

1. The EUT is controlled by using a Radio Communication Tester (MT8820C), and the communication between the EUT and the tester is established by air link.

2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.

3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.

4. SAR test reduction for GPRS mode is determined by the source-based time-averaged output power. The data mode with highest specified time-averaged output power should be tested for SAR compliance.

5. The 3G SAR test reduction procedure is applied to HSDPA with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSDPA) is ≤ ¼ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA).

6. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSPA) is ≤ ¼ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA).

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

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

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

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

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

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

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

d. Per Section 5.2.4, Higher order modulations

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

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

- For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.

WLAN

802.11b DSSS SAR Test Requirements:

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

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

802.11g/n OFDM SAR Test Exclusion Requirements:

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

11. 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.

12. 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)

13. According to **KDB447498D01v06** – The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances≤ 50 mm are determined by: [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for product specific 10-g SAR.
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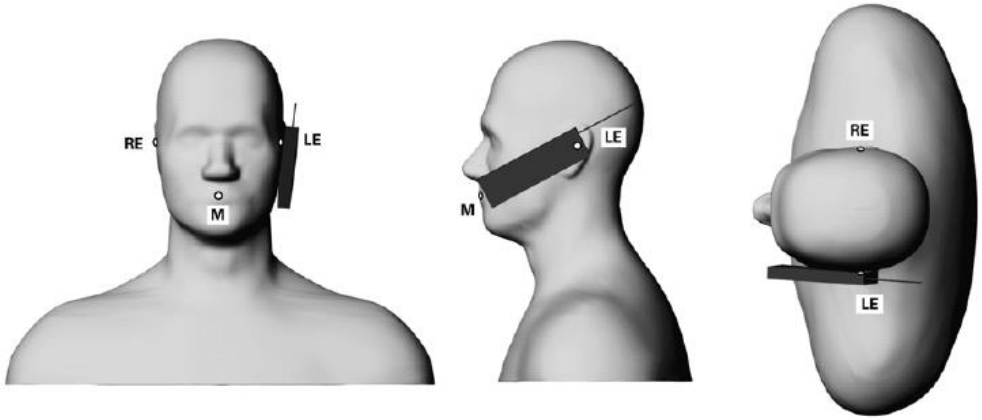
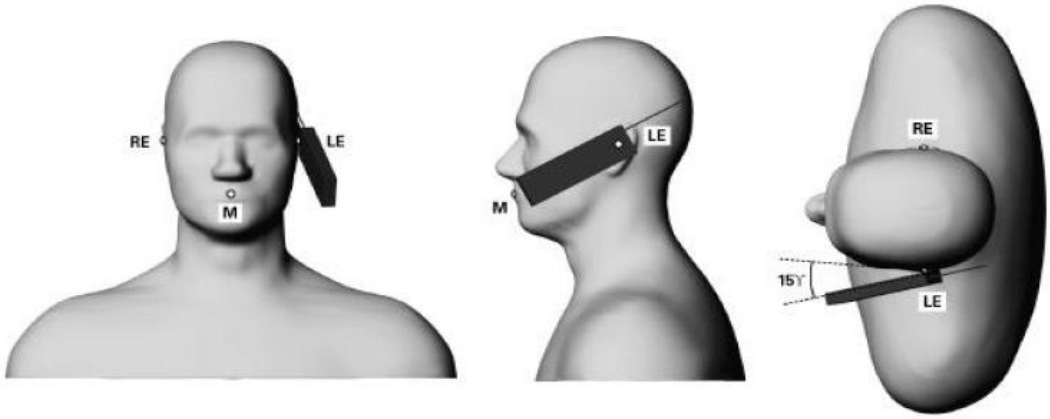
1.6 Positioning Procedure

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.

Body SAR measurement statement

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

2. Hotspot exposure: 10mm
   A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge when the form factor of a handset is larger than 9 cm × 5 cm,

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

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

3. Phablet SAR test consideration
   Since the device is not a phablet (overall diagonal dimension < 16.0 cm), phablet SAR procedure is not required for this device.

1.7 Evaluation Procedures

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

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

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

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

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

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D

interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found.
If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

1.8 Probe Calibration Procedures

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

1.8.1 Transfer Calibration with Temperature Probes

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

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

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

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

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

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

2. The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.
3. The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures (~ 2% for c; much better for ρ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed ±5%.
4. Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

Considering these problems, the possible accuracy of the calibration of E-field probes with temperature gradient measurements in a carefully designed setup is about ±10% (RSS) [2]. Recently, a setup which is a combination of the waveguide techniques and the thermal measurements was presented in [3]. The estimated uncertainty of the setup is ±5% (RSS) when the same liquid is used for the calibration and for actual measurements and ±7-9% (RSS) when not, which is in good agreement with the estimates given in [2].

1.8.2 Calibration with Analytical Fields

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

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

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

References

(1) N. Kuster, Q. Balzano, and J.C. Lin, Eds., *Mobile Communications Safety*, Chapman & Hall, London, 1997.

(2) K. Meier, M. Burkhardt, T. Schmid, and N. Kuster, \Broadband calibration of E-field probes in lossy media", *IEEE Transactions on Microwave Theory and Techniques*, vol. 44, no. 10, pp. 1954{1962, Oct. 1996.

(3) K. Jokela, P. Hyysalo, and L. Puranen, \Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", *IEEE Transactions on Instrumentation and Measurements*, vol. 47, no. 2, pp. 432{438, Apr. 1998.

1.9 The SAR Measurement System

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

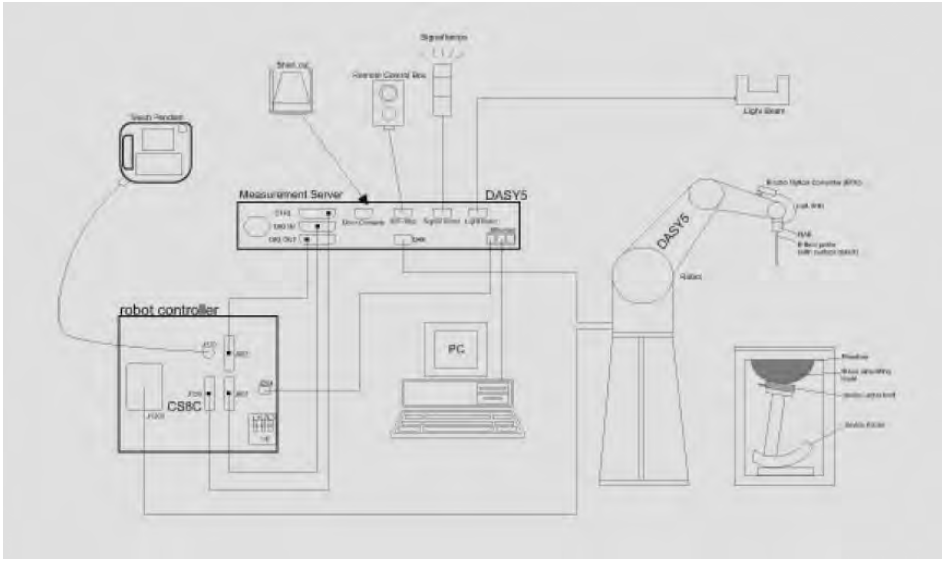


Fig. a A block diagram of the SAR measurement system

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.

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 HSL750/835/1900/2450/5200/5300/5600 MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.6 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Tip diameter: 2.5 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

Phantom

Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Height: 850 mm; Length: 1000 mm; Width: 500 mm

DEVICE HOLDER

Construction	In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Device Holder

1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% (according to KDB865664D01) from the target SAR values.
These tests were done at 750/835/1900/2450/5200/5300/5600 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the liquid depth above the ear reference points was above 15 cm (≤3G) or 10 cm (>3G) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

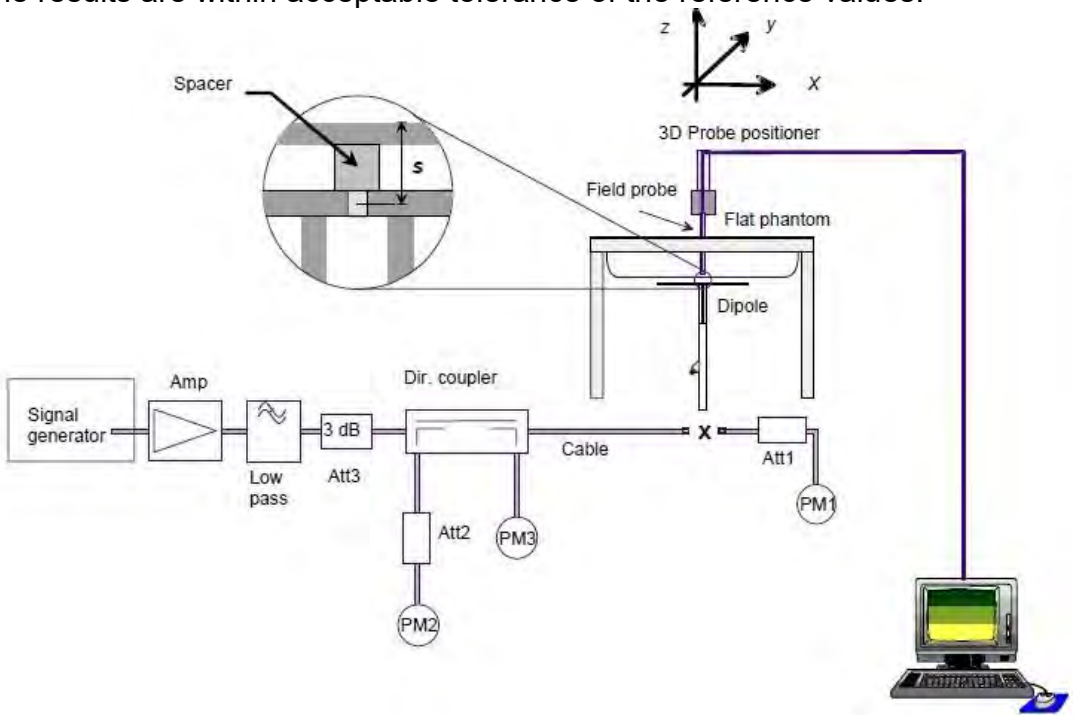


Fig. b The block diagram of system verification

Validation Kit	S/N	Frequency (MHz)		1W Target SAR-1g (mW/g)	Pin=250mW Measured SAR-1g (mW/g)	Measured SAR-1g normalized to 1W (mW/g)	Deviation (%)	Measured Date
D750V2	1015	750	Head	8.6	2.12	8.48	-1.40%	Apr. 17th, 2020
D835V2	4d063	835	Head	9.57	2.43	9.72	1.57%	Apr. 18th, 2020
D1900V2	5d173	1900	Head	40.2	9.92	39.68	-1.29%	Apr. 19th, 2020
D2450V2	727	2450	Head	53	13.90	55.60	4.91%	Apr. 20th, 2020
Validation Kit	S/N	Frequency (MHz)		1W Target SAR-1g (mW/g)	Pin=100mW Measured SAR-1g (mW/g)	Measured SAR-1g normalized to 1W (mW/g)	Deviation (%)	Measured Date
D5GHzV2	1023	5200	Head	80.1	8.02	80.20	0.12%	Apr. 21st, 2020
		5300	Head	82.8	8.36	83.60	0.97%	Apr. 22nd, 2020
		5600	Head	83.1	8.33	83.30	0.24%	Apr. 23rd, 2020

Table 1. Results of system validation

1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070E Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Network Analyzer.
All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was at least 15 cm (≤3G) or 10 cm (>3G) during all tests. (Appendix Fig. 2)

Tissue Type	Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	% dev εr	% dev σ
Head	Apr. 17th, 2020	704	42.181	0.890	41.535	0.895	-1.53%	0.59%
		707.5	42.162	0.890	41.527	0.896	-1.51%	0.67%
		709	42.155	0.890	41.513	0.897	-1.52%	0.77%
		710	42.149	0.890	41.508	0.898	-1.52%	0.87%
		711	42.144	0.890	41.504	0.901	-1.52%	1.20%
		750	41.942	0.893	41.308	0.902	-1.51%	0.97%
	Apr. 18th, 2020	824.2	41.556	0.899	40.762	0.903	-1.91%	0.43%
		826.4	41.545	0.899	40.755	0.911	-1.90%	1.30%
		829	41.531	0.900	40.743	0.912	-1.90%	1.39%
		835	41.500	0.900	40.741	0.913	-1.83%	1.44%
		836.5	41.500	0.902	40.724	0.914	-1.87%	1.37%
		836.6	41.500	0.902	40.720	0.915	-1.88%	1.47%
		844	41.500	0.910	40.707	0.922	-1.91%	1.35%
		846.6	41.500	0.912	40.701	0.925	-1.93%	1.37%
		848.8	41.500	0.915	40.699	0.928	-1.93%	1.44%
	Apr. 19th, 2020	1850.2	40.000	1.400	39.084	1.421	-2.29%	1.50%
		1880	40.000	1.400	39.082	1.425	-2.30%	1.79%
		1900	40.000	1.400	39.080	1.427	-2.30%	1.93%
		1909.8	40.000	1.400	39.064	1.428	-2.34%	2.00%
	Apr. 20th, 2020	2402	39.285	1.757	38.236	1.797	-2.67%	2.26%
		2412	39.268	1.766	38.199	1.804	-2.72%	2.14%
		2437	39.223	1.788	38.160	1.827	-2.71%	2.16%
		2441	39.216	1.792	38.141	1.832	-2.74%	2.23%
		2450	39.200	1.800	38.125	1.839	-2.74%	2.17%
		2457	39.191	1.808	38.122	1.848	-2.73%	2.23%
		2480	39.162	1.827	38.089	1.866	-2.74%	2.15%
	Apr. 21st, 2020	5180	36.009	4.635	34.827	4.556	-3.28%	-1.69%
		5200	35.986	4.655	34.805	4.576	-3.28%	-1.70%
		5220	35.963	4.676	34.794	4.597	-3.25%	-1.68%
		5240	35.940	4.696	34.754	4.616	-3.30%	-1.70%
	Apr. 22nd, 2020	5260	35.917	4.717	34.678	4.633	-3.45%	-1.77%
		5290	35.883	4.747	34.616	4.662	-3.53%	-1.80%
		5300	35.871	4.758	34.613	4.671	-3.51%	-1.82%
	Apr. 23rd, 2020	5530	35.609	4.993	34.327	4.888	-3.60%	-2.11%
		5600	35.529	5.065	34.242	4.958	-3.62%	-2.11%
		5670	35.449	5.137	34.172	5.031	-3.60%	-2.06%
		5710	35.403	5.178	34.128	5.066	-3.60%	-2.16%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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)
1900	Head	444.52 g	552.42 g	3.06 g	—	—	—	1.0L(Kg)
2450	Head	550 g	450 g	—	—	—	—	1.0L(Kg)

Simulating Liquids for 5 GHz, Manufactured by SPEAG:

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

Table 3. Recipes for tissue simulating liquid

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).

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.

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

GSM 850

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
Head (GSM)	Re Cheek	-	128	824.2	33.00	32.51	111.94%	0.315	0.353	-
	Re Cheek	-	190	836.6	33.00	32.45	113.50%	0.366	0.415	-
	Re Cheek	-	251	848.8	33.00	32.17	121.06%	0.435	0.527	70
	Re Tilt	-	128	824.2	33.00	32.51	111.94%	0.169	0.189	-
	Le Cheek	-	128	824.2	33.00	32.51	111.94%	0.227	0.254	-
	Le Tilt	-	128	824.2	33.00	32.51	111.94%	0.144	0.161	-
Body-worn (GSM)	Front side	10	128	824.2	33.00	32.51	111.94%	0.305	0.341	-
	Back side	10	128	824.2	33.00	32.51	111.94%	0.381	0.427	-
	Back side	10	190	836.6	33.00	32.45	113.50%	0.418	0.474	-
	Back side	10	251	848.8	33.00	32.17	121.06%	0.495	0.599	71
Hotspot (GPRS) <1Dn4Up>	Front side	10	251	848.8	28.50	28.07	110.41%	0.312	0.344	-
	Back side	10	128	824.2	28.50	27.83	116.68%	0.515	0.601	-
	Back side	10	190	836.6	28.50	27.89	115.08%	0.490	0.564	-
	Back side	10	251	848.8	28.50	28.07	110.41%	0.572	0.632	72
	Top side	10	251	848.8	28.50	28.07	110.41%	0.019	0.021	-
	Bottom side	10	251	848.8	28.50	28.07	110.41%	0.243	0.268	-
	Right side	10	251	848.8	28.50	28.07	110.41%	0.126	0.139	-
	Left side	10	251	848.8	28.50	28.07	110.41%	0.142	0.157	-

GSM 1900

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
Head (GSM)	Re Cheek	-	661	1880	30.00	29.56	110.66%	0.361	0.399	-
	Re Tilt	-	661	1880	30.00	29.56	110.66%	0.141	0.156	-
	Le Cheek	-	512	1850.2	30.00	29.46	113.24%	0.547	0.619	-
	Le Cheek	-	661	1880	30.00	29.56	110.66%	0.580	0.642	-
	Le Cheek	-	810	1909.8	30.00	29.23	119.40%	0.702	0.838	73
	Le Tilt	-	661	1880	30.00	29.56	110.66%	0.174	0.193	-
Body-worn (GSM)	Front side	10	661	1880	30.00	29.56	110.66%	0.341	0.377	-
	Back side	10	512	1850.2	30.00	29.46	113.24%	0.480	0.544	-
	Back side	10	661	1880	30.00	29.56	110.66%	0.434	0.480	-
	Back side	10	810	1909.8	30.00	29.23	119.40%	0.536	0.640	74
Hotspot (GPRS) <1Dn2Up>	Front side	10	661	1880	27.50	27.08	110.15%	0.518	0.571	-
	Back side	10	512	1850.2	27.50	27.03	111.43%	0.567	0.632	-
	Back side	10	661	1880	27.50	27.08	110.15%	0.594	0.654	75
	Back side	10	810	1909.8	27.50	27.07	110.41%	0.573	0.633	-
	Top side	10	661	1880	27.50	27.08	110.15%	0.028	0.031	-
	Bottom side	10	661	1880	27.50	27.08	110.15%	0.461	0.508	-
	Right side	10	661	1880	27.50	27.08	110.15%	0.043	0.047	-
	Left side	10	661	1880	27.50	27.08	110.15%	0.362	0.399	-

WCDMA Band V

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
								Measured	Reported	
R99 (Head)	RE Cheek	-	4132	826.4	24	23.60	109.65%	0.458	0.502	-
	RE Cheek	-	4183	836.6	24	23.50	112.20%	0.511	0.573	-
	RE Cheek	-	4233	846.6	24	23.56	110.66%	0.555	0.614	76
	RE Tilt	-	4132	826.4	24	23.60	109.65%	0.259	0.284	-
	LE Cheek	-	4132	826.4	24	23.60	109.65%	0.357	0.391	-
	LE Tilt	-	4132	826.4	24	23.60	109.65%	0.233	0.255	-
Hotspot	Front side	10	4132	826.4	24	23.60	109.65%	0.466	0.511	-
	Back side	10	4132	826.4	24	23.60	109.65%	0.560	0.614	77
	Back side	10	4183	836.6	24	23.50	112.20%	0.478	0.536	-
	Back side	10	4233	846.6	24	23.56	110.66%	0.459	0.508	-
	Top side	10	4132	826.4	24	23.60	109.65%	0.025	0.027	-
	Bottom side	10	4132	826.4	24	23.60	109.65%	0.265	0.291	-
	Right side	10	4132	826.4	24	23.60	109.65%	0.467	0.512	-
	Left side	10	4132	826.4	24	23.60	109.65%	0.248	0.272	-

LTE FDD Band 5

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
Head	10MHz	QPSK	1 RB	25	RE Cheek	-	20450	829	24	23.19	120.50%	0.459	0.553	-
					RE Cheek	-	20525	836.5	24	23.61	109.40%	0.471	0.515	-
					RE Cheek	-	20600	844	24	23.18	120.78%	0.500	0.604	78
					RE Tilt	-	20525	836.5	24	23.61	109.40%	0.263	0.288	-
					LE Cheek	-	20525	836.5	24	23.61	109.40%	0.350	0.383	-
					LE Tilt	-	20525	836.5	24	23.61	109.40%	0.278	0.304	-
			25 RB	0	RE Cheek	-	20600	844	23	22.26	118.58%	0.389	0.461	-
					RE Tilt	-	20600	844	23	22.26	118.58%	0.198	0.235	-
					LE Cheek	-	20600	844	23	22.26	118.58%	0.216	0.256	-
					LE Tilt	-	20600	844	23	22.26	118.58%	0.172	0.204	-
			50 RB		RE Cheek	-	20600	844	23	22.17	121.06%	0.396	0.479	-
					RE Tilt	-	20600	844	23	22.17	121.06%	0.184	0.223	-
					LE Cheek	-	20600	844	23	22.17	121.06%	0.294	0.356	-
					LE Tilt	-	20600	844	23	22.17	121.06%	0.236	0.286	-
Hotspot	10MHz	QPSK	1 RB	25	Front side	10	20525	836.5	24	23.61	109.40%	0.434	0.475	-
					Back side	10	20450	829	24	23.19	120.50%	0.491	0.592	-
					Back side	10	20525	836.5	24	23.61	109.40%	0.544	0.595	-
					Back side	10	20600	844	24	23.18	120.78%	0.592	0.715	79
					Top side	10	20525	836.5	24	23.61	109.40%	0.001	0.002	-
					Bottom side	10	20525	836.5	24	23.61	109.40%	0.276	0.302	-
					Right side	10	20525	836.5	24	23.61	109.40%	0.453	0.496	-
					Left side	10	20525	836.5	24	23.61	109.40%	0.227	0.248	-
			25 RB	0	Front side	10	20600	844	23	22.26	118.58%	0.443	0.525	-
					Back side	10	20600	844	23	22.26	118.58%	0.555	0.658	-
					Top side	10	20600	844	23	22.26	118.58%	0.001	0.001	-
					Bottom side	10	20600	844	23	22.26	118.58%	0.282	0.334	-
					Right side	10	20600	844	23	22.26	118.58%	0.462	0.548	-
					Left side	10	20600	844	23	22.26	118.58%	0.232	0.275	-
			50 RB		Front side	10	20600	844	23	22.17	121.06%	0.424	0.513	-
					Back side	10	20600	844	23	22.17	121.06%	0.532	0.644	-
					Top side	10	20600	844	23	22.17	121.06%	0.001	0.001	-
					Bottom side	10	20600	844	23	22.17	121.06%	0.270	0.327	-
					Right side	10	20600	844	23	22.17	121.06%	0.442	0.535	-
					Left side	10	20600	844	23	22.17	121.06%	0.223	0.270	-

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	
Head	10MHz	QPSK	1 RB	25	RE Cheek	-	23060	704	24	23.72	106.66%	0.060	0.064	-
					RE Cheek	-	23095	707.5	24	23.39	115.08%	0.071	0.082	-
					RE Cheek	-	23130	711	24	23.48	112.72%	0.074	0.083	80
					RE Tilt	-	23060	704	24	23.72	106.66%	0.039	0.042	-
					LE Cheek	-	23060	704	24	23.72	106.66%	0.045	0.048	-
					LE Tilt	-	23060	704	24	23.72	106.66%	0.028	0.030	-
			25 RB	25	RE Cheek	-	23060	704	23	22.44	113.76%	0.071	0.081	-
					RE Tilt	-	23060	704	23	22.44	113.76%	0.046	0.052	-
					LE Cheek	-	23060	704	23	22.44	113.76%	0.053	0.060	-
					LE Tilt	-	23060	704	23	22.44	113.76%	0.033	0.038	-
			50 RB		RE Cheek	-	23095	707.5	23	22.43	114.02%	0.068	0.078	-
					RE Tilt	-	23095	707.5	23	22.43	114.02%	0.044	0.050	-
					LE Cheek	-	23095	707.5	23	22.43	114.02%	0.052	0.059	-
					LE Tilt	-	23095	707.5	23	22.43	114.02%	0.032	0.036	-
Hotspot	10MHz	QPSK	1 RB	25	Front side	10	23060	704	24	23.72	106.66%	0.072	0.077	-
					Back side	10	23060	704	24	23.72	106.66%	0.111	0.118	-
					Back side	10	23095	707.5	24	23.39	115.08%	0.119	0.137	-
					Back side	10	23130	711	24	23.48	112.72%	0.124	0.140	81
					Top side	10	23060	704	24	23.72	106.66%	0.002	0.003	-
					Bottom side	10	23060	704	24	23.72	106.66%	0.036	0.038	-
					Right side	10	23060	704	24	23.72	106.66%	0.067	0.071	-
					Left side	10	23060	704	24	23.72	106.66%	0.038	0.041	-
			25 RB	25	Front side	10	23060	704	23	22.44	113.76%	0.070	0.080	-
					Back side	10	23060	704	23	22.44	113.76%	0.109	0.124	-
					Top side	10	23060	704	23	22.44	113.76%	0.002	0.003	-
					Bottom side	10	23060	704	23	22.44	113.76%	0.034	0.039	-
					Right side	10	23060	704	23	22.44	113.76%	0.064	0.073	-
					Left side	10	23060	704	23	22.44	113.76%	0.036	0.041	-
			50 RB		Front side	10	23095	707.5	23	22.43	114.02%	0.066	0.075	-
					Back side	10	23095	707.5	23	22.43	114.02%	0.101	0.115	-
					Top side	10	23095	707.5	23	22.43	114.02%	0.002	0.002	-
					Bottom side	10	23095	707.5	23	22.43	114.02%	0.032	0.036	-
					Right side	10	23095	707.5	23	22.43	114.02%	0.061	0.070	-
					Left side	10	23095	707.5	23	22.43	114.02%	0.034	0.039	-

LTE FDD Band 17

Mode	Bandwidth (MHz)	Modulation	RB Size	RB start	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged SAR over 1g (W/kg)		Plot page
												Measured	Reported	
Head	10MHz	QPSK	1 RB	25	RE Cheek	-	23780	709	24	23.29	117.76%	0.070	0.082	-
					RE Cheek	-	23790	710	24	23.43	114.02%	0.065	0.074	-
					RE Tilt	-	23790	710	24	23.43	114.02%	0.042	0.048	-
					LE Cheek	-	23790	710	24	23.43	114.02%	0.049	0.056	-
					LE Tilt	-	23790	710	24	23.43	114.02%	0.030	0.034	-
				49	RE Cheek	-	23800	711	24	23.22	119.67%	0.073	0.087	82
			25 RB	0	RE Cheek	-	23780	709	23	22.36	115.88%	0.069	0.080	-
					RE Tilt	-	23780	709	23	22.36	115.88%	0.045	0.052	-
					LE Cheek	-	23780	709	23	22.36	115.88%	0.052	0.060	-
					LE Tilt	-	23780	709	23	22.36	115.88%	0.032	0.037	-
			50 RB		RE Cheek	-	23780	709	23	22.34	116.41%	0.065	0.076	-
					RE Tilt	-	23780	709	23	22.34	116.41%	0.042	0.049	-
					LE Cheek	-	23780	709	23	22.34	116.41%	0.049	0.057	-
					LE Tilt	-	23780	709	23	22.34	116.41%	0.030	0.035	-
Hotspot	10MHz	QPSK	1 RB	25	Front side	10	23790	710	24	23.43	114.02%	0.079	0.090	-
					Back side	10	23780	709	24	23.29	117.76%	0.116	0.137	-
					Back side	10	23790	710	24	23.43	114.02%	0.123	0.140	-
					Top side	10	23790	710	24	23.43	114.02%	0.003	0.004	-
					Bottom side	10	23790	710	24	23.43	114.02%	0.040	0.046	-
					Right side	10	23790	710	24	23.43	114.02%	0.075	0.086	-
					Left side	10	23790	710	24	23.43	114.02%	0.041	0.047	-
				49	Back side	10	23800	711	24	23.22	119.67%	0.126	0.151	83
			25 RB	0	Front side	10	23780	709	23	22.36	115.88%	0.072	0.083	-
					Back side	10	23780	709	23	22.36	115.88%	0.111	0.129	-
					Top side	10	23780	709	23	22.36	115.88%	0.002	0.003	-
					Bottom side	10	23780	709	23	22.36	115.88%	0.036	0.042	-
					Right side	10	23780	709	23	22.36	115.88%	0.066	0.076	-
					Left side	10	23780	709	23	22.36	115.88%	0.038	0.044	-
			50 RB		Front side	10	23780	709	23	22.34	116.41%	0.066	0.077	-
					Back side	10	23780	709	23	22.34	116.41%	0.103	0.120	-
					Top side	10	23780	709	23	22.34	116.41%	0.002	0.002	-
					Bottom side	10	23780	709	23	22.34	116.41%	0.032	0.037	-
					Right side	10	23780	709	23	22.34	116.41%	0.061	0.071	-
					Left side	10	23780	709	23	22.34	116.41%	0.035	0.041	-

WLAN 802.11b

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	duty cycle scaling	power scaling	Averaged SAR over 1g (W/kg)		Plot page
									Measured	Reported	
Head	RE Cheek	-	10	2457	16	15.81	1.007	104.47%	0.208	0.219	-
	RE Tilt	-	10	2457	16	15.81	1.007	104.47%	0.133	0.140	-
	LE Cheek	-	10	2457	16	15.81	1.007	104.47%	0.479	0.504	84
	LE Tilt	-	10	2457	16	15.81	1.007	104.47%	0.278	0.293	-
Hotspot	Front side	10	10	2457	16	15.81	1.007	104.47%	0.071	0.075	-
	Back side	10	10	2457	16	15.81	1.007	104.47%	0.074	0.078	85
	Top side	10	10	2457	16	15.81	1.007	104.47%	0.027	0.028	-
	Right side	10	10	2457	16	15.81	1.007	104.47%	0.035	0.037	-
	Left side	10	10	2457	16	15.81	1.007	104.47%	0.005	0.005	-

Bluetooth

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	duty cycle scaling	power scaling	Averaged SAR over 1g (W/kg)		Plot page
									Measured	Reported	
Head	RE Cheek	-	78	2480	10.5	10.27	1.302	105.44%	0.036	0.049	-
	RE Tilt	-	78	2480	10.5	10.27	1.302	105.44%	0.023	0.032	-
	LE Cheek	-	78	2480	10.5	10.27	1.302	105.44%	0.082	0.113	86
	LE Tilt	-	78	2480	10.5	10.27	1.302	105.44%	0.048	0.066	-
Body-worn	Front side	10	78	2480	10.5	10.27	1.302	105.44%	0.021	0.029	-
	Back side	10	78	2480	10.5	10.27	1.302	105.44%	0.038	0.052	87

WLAN 802.11a 5.2G

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	duty cycle scaling	power scaling	Averaged SAR over 1g (W/kg)		Plot page
									Measured	Reported	
Head	RE Cheek	-	36	5180	11.5	11.21	1.024	106.91%	0.173	0.189	-
	RE Tilt	-	36	5180	11.5	11.21	1.024	106.91%	0.171	0.187	-
	LE Cheek	-	36	5180	11.5	11.21	1.024	106.91%	0.294	0.322	8
	LE Tilt	-	36	5180	11.5	11.21	1.024	106.91%	0.229	0.251	-
Body-worn	Front side	10	36	5180	11.5	11.21	1.024	106.91%	0.050	0.055	-
	Back side	10	36	5180	11.5	11.21	1.024	106.91%	0.154	0.169	89

WLAN 802.11ac(80M) 5.3G

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	duty cycle scaling	power scaling	Averaged SAR over 1g (W/kg)		Plot page
									Measured	Reported	
Head	RE Cheek	-	58	5290	11.5	11.02	1.013	111.69%	0.118	0.133	-
	RE Tilt	-	58	5290	11.5	11.02	1.013	111.69%	0.116	0.131	-
	LE Cheek	-	58	5290	11.5	11.02	1.013	111.69%	0.200	0.226	90
	LE Tilt	-	58	5290	11.5	11.02	1.013	111.69%	0.155	0.175	-
Body-worn	Front side	10	58	5290	11.5	11.02	1.013	111.69%	0.047	0.053	-
	Back side	10	58	5290	11.5	11.02	1.013	111.69%	0.099	0.112	91

WLAN 802.11ac(80M) 5.6G

Mode	Position	Distance (mm)	CH	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	duty cycle scaling	power scaling	Averaged SAR over 1g (W/kg)		Plot page
									Measured	Reported	
Head	RE Cheek	-	106	5530	11.5	11.04	1.013	111.17%	0.122	0.137	-
	RE Tilt	-	106	5530	11.5	11.04	1.013	111.17%	0.207	0.233	-
	LE Cheek	-	106	5530	11.5	11.04	1.013	111.17%	0.208	0.234	92
	LE Tilt	-	106	5530	11.5	11.04	1.013	111.17%	0.161	0.181	-
Body-worn	Front side	10	106	5530	11.5	11.04	1.013	111.17%	0.030	0.034	-
	Back side	10	106	5530	11.5	11.04	1.013	111.17%	0.173	0.195	93

Note:

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

Reported SAR = measured SAR * Power scaling * Duty cycle scaling
Where P2 is maximum specified power, P1 is measured conducted power

2.3 Reporting statements of conformity

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

3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

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

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

3.1 Estimated SAR calculation

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

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

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

3.2 SPLSR evaluation and analysis

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

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

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

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

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

Simultaneous Transmission Combination

reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	WLAN	<1.6W/kg	
GSM 850	Head	Right cheek	0.527	0.219	0.746	ΣSAR<1.6,Not required
		Right tilt	0.189	0.140	0.329	ΣSAR<1.6,Not required
		Left cheek	0.254	0.504	0.758	ΣSAR<1.6,Not required
		Left tilt	0.161	0.293	0.454	ΣSAR<1.6,Not required
GPRS 850 (1Dn4UP)	Hotspot	Front side	0.344	0.075	0.419	ΣSAR<1.6,Not required
		Back side	0.632	0.078	0.710	ΣSAR<1.6,Not required
		Top side	0.021	0.028	0.049	ΣSAR<1.6,Not required
		Bottom side	0.268	-	0.268	ΣSAR<1.6,Not required
		Right side	0.139	0.037	0.176	ΣSAR<1.6,Not required
		Left side	0.157	0.005	0.162	ΣSAR<1.6,Not required
GSM 1900	Head	Right cheek	0.399	0.219	0.618	ΣSAR<1.6,Not required
		Right tilt	0.156	0.140	0.296	ΣSAR<1.6,Not required
		Left cheek	0.838	0.504	1.342	ΣSAR<1.6,Not required
		Left tilt	0.193	0.293	0.486	ΣSAR<1.6,Not required
GPRS 1900 (1Dn2UP)	Hotspot	Front side	0.571	0.075	0.646	ΣSAR<1.6,Not required
		Back side	0.654	0.078	0.732	ΣSAR<1.6,Not required
		Top side	0.031	0.028	0.059	ΣSAR<1.6,Not required
		Bottom side	0.508	-	0.508	ΣSAR<1.6,Not required
		Right side	0.047	0.037	0.084	ΣSAR<1.6,Not required
		Left side	0.399	0.005	0.404	ΣSAR<1.6,Not required

reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	WLAN	<1.6W/kg	
WCDMA Band V	Head	Right cheek	0.614	0.219	0.833	ΣSAR<1.6,Not required
		Right tilt	0.284	0.140	0.424	ΣSAR<1.6,Not required
		Left cheek	0.391	0.504	0.895	ΣSAR<1.6,Not required
		Left tilt	0.255	0.293	0.548	ΣSAR<1.6,Not required
	Hotspot	Front side	0.511	0.075	0.586	ΣSAR<1.6,Not required
		Back side	0.614	0.078	0.692	ΣSAR<1.6,Not required
		Top side	0.027	0.028	0.055	ΣSAR<1.6,Not required
		Bottom side	0.291	-	0.291	ΣSAR<1.6,Not required
		Right side	0.512	0.037	0.549	ΣSAR<1.6,Not required
		Left side	0.272	0.005	0.277	ΣSAR<1.6,Not required
LTE FDD Band 5	Head	Right cheek	0.604	0.219	0.823	ΣSAR<1.6,Not required
		Right tilt	0.288	0.140	0.428	ΣSAR<1.6,Not required
		Left cheek	0.383	0.504	0.887	ΣSAR<1.6,Not required
		Left tilt	0.304	0.293	0.597	ΣSAR<1.6,Not required
	Hotspot	Front side	0.525	0.075	0.600	ΣSAR<1.6,Not required
		Back side	0.715	0.078	0.793	ΣSAR<1.6,Not required
		Top side	0.002	0.028	0.030	ΣSAR<1.6,Not required
		Bottom side	0.334	-	0.334	ΣSAR<1.6,Not required
		Right side	0.548	0.037	0.585	ΣSAR<1.6,Not required
		Left side	0.275	0.005	0.280	ΣSAR<1.6,Not required

reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	WLAN	<1.6W/kg	
LTE FDD Band 12	Head	Right cheek	0.083	0.219	0.302	ΣSAR<1.6,Not required
		Right tilt	0.052	0.140	0.192	ΣSAR<1.6,Not required
		Left cheek	0.060	0.504	0.564	ΣSAR<1.6,Not required
		Left tilt	0.038	0.293	0.331	ΣSAR<1.6,Not required
	Hotspot	Front side	0.080	0.075	0.155	ΣSAR<1.6,Not required
		Back side	0.140	0.078	0.218	ΣSAR<1.6,Not required
		Top side	0.003	0.028	0.031	ΣSAR<1.6,Not required
		Bottom side	0.039	-	0.039	ΣSAR<1.6,Not required
		Right side	0.073	0.037	0.110	ΣSAR<1.6,Not required
		Left side	0.041	0.005	0.046	ΣSAR<1.6,Not required
LTE FDD Band 17	Head	Right cheek	0.087	0.219	0.306	ΣSAR<1.6,Not required
		Right tilt	0.052	0.140	0.192	ΣSAR<1.6,Not required
		Left cheek	0.060	0.504	0.564	ΣSAR<1.6,Not required
		Left tilt	0.037	0.293	0.330	ΣSAR<1.6,Not required
	Hotspot	Front side	0.090	0.075	0.165	ΣSAR<1.6,Not required
		Back side	0.151	0.078	0.229	ΣSAR<1.6,Not required
		Top side	0.004	0.028	0.032	ΣSAR<1.6,Not required
		Bottom side	0.046	-	0.046	ΣSAR<1.6,Not required
		Right side	0.086	0.037	0.123	ΣSAR<1.6,Not required
		Left side	0.047	0.005	0.052	ΣSAR<1.6,Not required

reported SAR WWAN and WLAN 5GHz, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	WLAN	<1.6W/kg	
GSM 850	Head	Right cheek	0.527	0.189	0.716	ΣSAR<1.6,Not required
		Right tilt	0.189	0.233	0.422	ΣSAR<1.6,Not required
		Left cheek	0.254	0.322	0.576	ΣSAR<1.6,Not required
		Left tilt	0.161	0.251	0.412	ΣSAR<1.6,Not required
	Body-worn	Front side	0.341	0.055	0.396	ΣSAR<1.6,Not required
		Back side	0.599	0.195	0.794	ΣSAR<1.6,Not required
GSM 1900	Head	Right cheek	0.399	0.189	0.588	ΣSAR<1.6,Not required
		Right tilt	0.156	0.233	0.389	ΣSAR<1.6,Not required
		Left cheek	0.838	0.322	1.160	ΣSAR<1.6,Not required
		Left tilt	0.193	0.251	0.444	ΣSAR<1.6,Not required
	Body-worn	Front side	0.377	0.055	0.432	ΣSAR<1.6,Not required
		Back side	0.640	0.195	0.835	ΣSAR<1.6,Not required

reported SAR WWAN and WLAN 5GHz, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	WLAN	<1.6W/kg	
WCDMA Band V	Head	Right cheek	0.614	0.189	0.803	ΣSAR<1.6,Not required
		Right tilt	0.284	0.233	0.517	ΣSAR<1.6,Not required
		Left cheek	0.391	0.322	0.713	ΣSAR<1.6,Not required
		Left tilt	0.255	0.251	0.506	ΣSAR<1.6,Not required
	Body-worn	Front side	0.511	0.055	0.566	ΣSAR<1.6,Not required
		Back side	0.614	0.195	0.809	ΣSAR<1.6,Not required
LTE FDD Band 5	Head	Right cheek	0.604	0.189	0.793	ΣSAR<1.6,Not required
		Right tilt	0.288	0.233	0.521	ΣSAR<1.6,Not required
		Left cheek	0.383	0.322	0.705	ΣSAR<1.6,Not required
		Left tilt	0.304	0.251	0.555	ΣSAR<1.6,Not required
	Body-worn	Front side	0.525	0.055	0.580	ΣSAR<1.6,Not required
		Back side	0.715	0.195	0.910	ΣSAR<1.6,Not required
LTE FDD Band 12	Head	Right cheek	0.083	0.189	0.272	ΣSAR<1.6,Not required
		Right tilt	0.052	0.233	0.285	ΣSAR<1.6,Not required
		Left cheek	0.060	0.322	0.382	ΣSAR<1.6,Not required
		Left tilt	0.038	0.251	0.289	ΣSAR<1.6,Not required
	Body-worn	Front side	0.080	0.055	0.135	ΣSAR<1.6,Not required
		Back side	0.140	0.195	0.335	ΣSAR<1.6,Not required
LTE FDD Band 17	Head	Right cheek	0.087	0.189	0.276	ΣSAR<1.6,Not required
		Right tilt	0.052	0.233	0.285	ΣSAR<1.6,Not required
		Left cheek	0.060	0.322	0.382	ΣSAR<1.6,Not required
		Left tilt	0.037	0.251	0.288	ΣSAR<1.6,Not required
	Body-worn	Front side	0.090	0.055	0.145	ΣSAR<1.6,Not required
		Back side	0.151	0.195	0.346	ΣSAR<1.6,Not required

reported SAR WWAN and Bluetooth, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	BT	<1.6W/kg	
GSM 850	Head	Right cheek	0.527	0.049	0.576	ΣSAR<1.6,Not required
		Right tilt	0.189	0.032	0.221	ΣSAR<1.6,Not required
		Left cheek	0.254	0.113	0.367	ΣSAR<1.6,Not required
		Left tilt	0.161	0.066	0.227	ΣSAR<1.6,Not required
	Body-worn	Front side	0.341	0.029	0.370	ΣSAR<1.6,Not required
		Back side	0.599	0.052	0.651	ΣSAR<1.6,Not required
GSM 1900	Head	Right cheek	0.399	0.049	0.448	ΣSAR<1.6,Not required
		Right tilt	0.156	0.032	0.188	ΣSAR<1.6,Not required
		Left cheek	0.838	0.113	0.951	ΣSAR<1.6,Not required
		Left tilt	0.193	0.066	0.259	ΣSAR<1.6,Not required
	Body-worn	Front side	0.377	0.029	0.406	ΣSAR<1.6,Not required
		Back side	0.640	0.052	0.692	ΣSAR<1.6,Not required

reported SAR WWAN and Bluetooth, ΣSAR evaluation						
Frequency band	Position		reported SAR / W/kg		ΣSAR	SPLSR
			WWAN	BT	<1.6W/kg	
WCDMA Band V	Head	Right cheek	0.614	0.049	0.663	ΣSAR<1.6,Not required
		Right tilt	0.284	0.032	0.316	ΣSAR<1.6,Not required
		Left cheek	0.391	0.113	0.504	ΣSAR<1.6,Not required
		Left tilt	0.255	0.066	0.321	ΣSAR<1.6,Not required
	Body-worn	Front side	0.511	0.029	0.540	ΣSAR<1.6,Not required
		Back side	0.614	0.052	0.666	ΣSAR<1.6,Not required
LTE FDD Band 5	Head	Right cheek	0.604	0.049	0.653	ΣSAR<1.6,Not required
		Right tilt	0.288	0.032	0.320	ΣSAR<1.6,Not required
		Left cheek	0.383	0.113	0.496	ΣSAR<1.6,Not required
		Left tilt	0.304	0.066	0.370	ΣSAR<1.6,Not required
	Body-worn	Front side	0.525	0.029	0.554	ΣSAR<1.6,Not required
		Back side	0.715	0.052	0.767	ΣSAR<1.6,Not required
LTE FDD Band 12	Head	Right cheek	0.083	0.049	0.132	ΣSAR<1.6,Not required
		Right tilt	0.052	0.032	0.084	ΣSAR<1.6,Not required
		Left cheek	0.060	0.113	0.173	ΣSAR<1.6,Not required
		Left tilt	0.038	0.066	0.104	ΣSAR<1.6,Not required
	Body-worn	Front side	0.080	0.029	0.109	ΣSAR<1.6,Not required
		Back side	0.140	0.052	0.192	ΣSAR<1.6,Not required
LTE FDD Band 17	Head	Right cheek	0.087	0.049	0.136	ΣSAR<1.6,Not required
		Right tilt	0.052	0.032	0.084	ΣSAR<1.6,Not required
		Left cheek	0.060	0.113	0.173	ΣSAR<1.6,Not required
		Left tilt	0.037	0.066	0.103	ΣSAR<1.6,Not required
	Body-worn	Front side	0.090	0.029	0.119	ΣSAR<1.6,Not required
		Back side	0.151	0.052	0.203	ΣSAR<1.6,Not required

4. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	3938	Feb.27th,2020	Feb.26th,2021
SPEAG	System Validation Dipole	D750V3	1015	Aug.23rd,2019	Aug.22nd,2020
		D835V2	4d063	Aug.23rd,2019	Aug.22nd,2020
		D1900V2	5d173	Apr.23rd,2019	Apr.22nd,2020
		D2450V2	727	Apr.24th,2019	Apr.23rd,2020
		D5GHzV2	1023	Jan.28th,2020	Jan.27th,2021
SPEAG	Data acquisition Electronics	DAE4	917	Dec.17th,2019	Dec.16th,2020
SPEAG	Software	DASY 52 V52.10.3	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	Agilent	E5071C	MY46100433	Dec.13th,2019	Dec.12th,2020
Agilent	Dielectric Probe Kit	85070E	MY44300677	Calibration not required	Calibration not required
Agilent	Dual-directional coupler	772D	MY52180142	Aug.30th,2019	Aug.29th,2020
		778D	MY52180302	Aug.30th,2019	Aug.29th,2020
Agilent	RF Signal Generator	N5181A	MY50144142	Dec.12th,2019	Dec.11th,2020
Agilent	Power Meter	ML2496A	1337004	Dec.19th,2019	Dec.18th,2020
Agilent	Power Sensor	MA2411B	1306052	Dec.19th,2019	Dec.18th,2020
TECPEL	Digital thermometer	DTM-303A	TP190085	Dec.16th,2019	Dec.15th,2020
Anritsu	Radio Communication Test	MT8820C	6201061049	Dec.8th,2019	Dec.7th,2020

5. Measurements

Date: Apr. 18th, 2020

Report No. : E5/2020/40001
GSM 850_Head_Re Cheek_CH 251

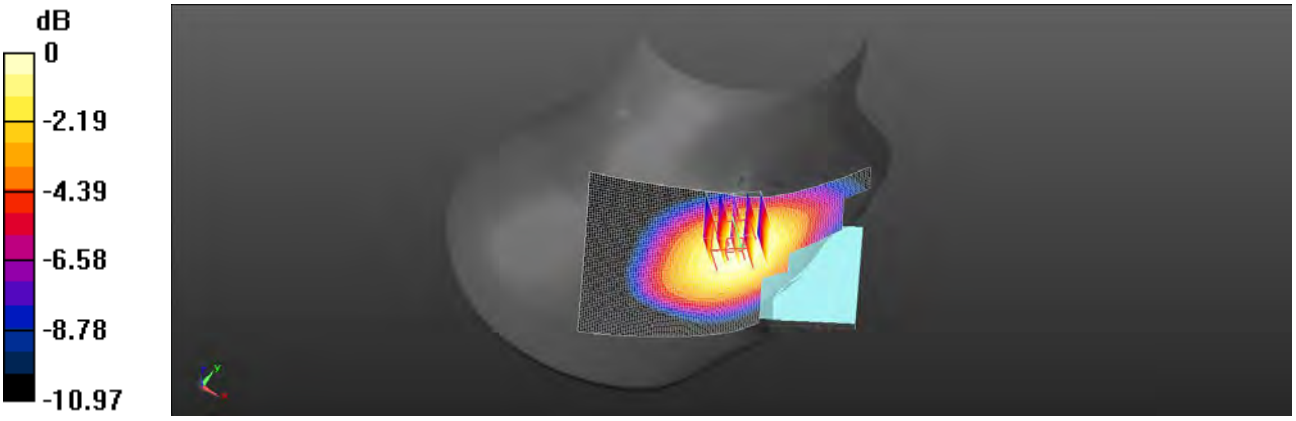
Communication System: GSM ; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.928 S/m; ε_r = 40.699; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.508 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.795 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.550 W/kg
SAR(1 g) = 0.435 W/kg; SAR(10 g) = 0.325 W/kg
Smallest distance from peaks to all points 3 dB below = 22.9 mm
Ratio of SAR at M2 to SAR at M1 = 78.6%
Maximum value of SAR (measured) = 0.501 W/kg



0 dB = 0.501 W/kg = -3.00 dBW/kg

Date: Apr. 18th, 2020

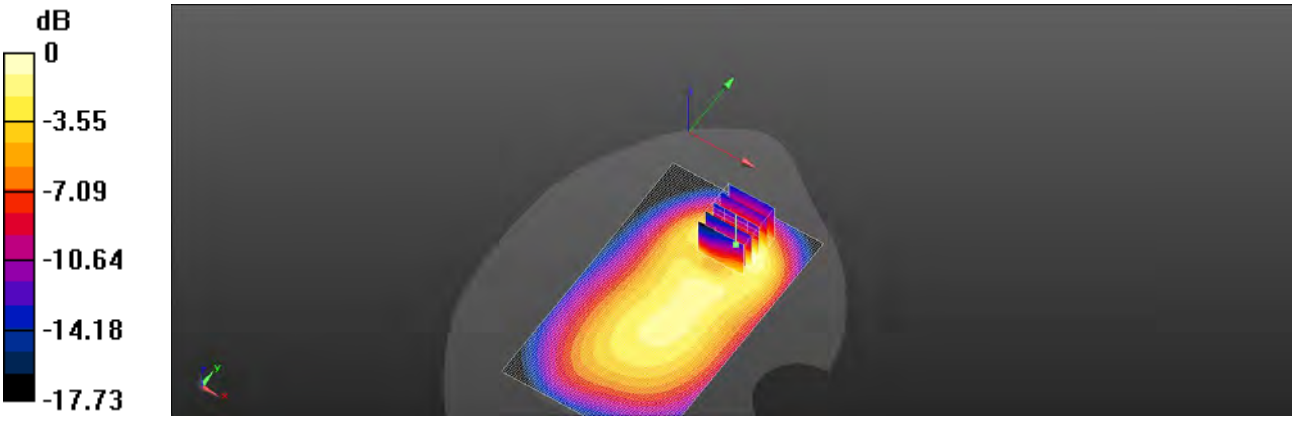
Report No. : E5/2020/40001
GSM 850_Body-worn_Back sidek_CH 251_10mm
Communication System: GSM ; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.928 S/m; ε_r = 40.699; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.696 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.49 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.879 W/kg
SAR(1 g) = 0.495 W/kg; SAR(10 g) = 0.273 W/kg
Smallest distance from peaks to all points 3 dB below = 11.2 mm
Ratio of SAR at M2 to SAR at M1 = 56.9%
Maximum value of SAR (measured) = 0.703 W/kg



0 dB = 0.703 W/kg = -1.53 dBW/kg

Date: Apr. 18th, 2020

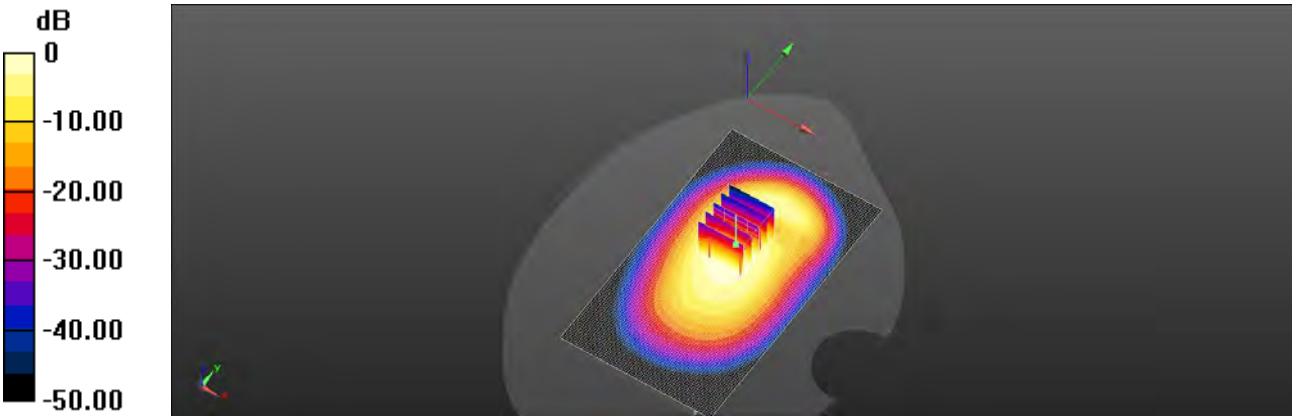
Report No. : E5/2020/40001
GPRS 850_Hotspot_Back sidek_CH 251_10mm
Communication System: GPRS ; Frequency: 848.8 MHz; Duty Cycle: 1:2
Medium parameters used: f = 849 MHz; σ = 0.928 S/m; ε_r = 40.699; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.721 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.07 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.572 W/kg; SAR(10 g) = 0.284 W/kg
Smallest distance from peaks to all points 3 dB below = 8.6 mm
Ratio of SAR at M2 to SAR at M1 = 56.9%
Maximum value of SAR (measured) = 0.681 W/kg



0 dB = 0.681 W/kg = -1.67 dBW/kg

Date: Apr. 19th, 2020

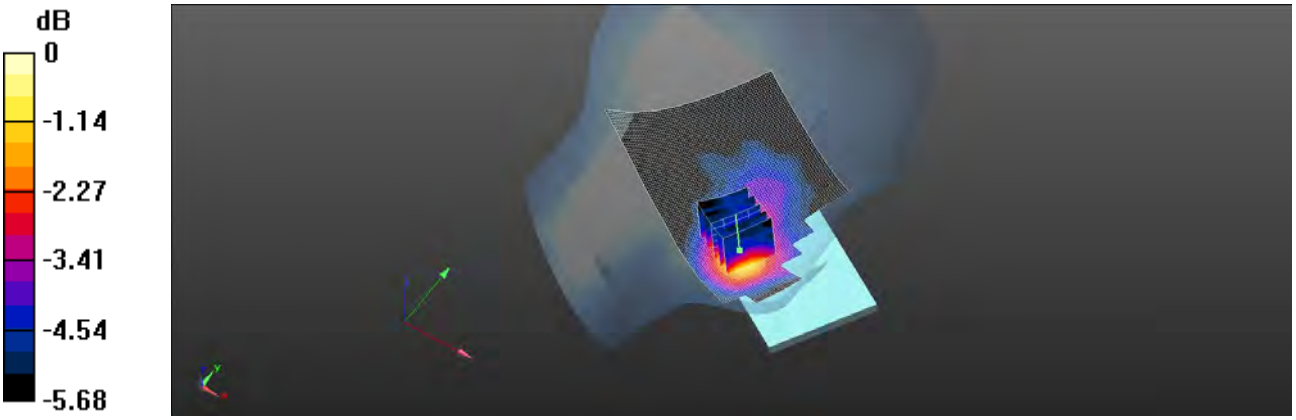
Report No. : E5/2020/40001
GSM 1900_Head_Le Cheek_CH 810
Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1910 MHz; σ = 1.428 S/m; ε_r = 39.064; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(8.07, 8.07, 8.07); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.861 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.18 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.702 W/kg; SAR(10 g) = 0.505 W/kg
Smallest distance from peaks to all points 3 dB below = 15.8 mm
Ratio of SAR at M2 to SAR at M1 = 70.4%
Maximum value of SAR (measured) = 0.850 W/kg



0 dB = 0.850 W/kg = -0.70 dBW/kg

Date: Apr. 19th, 2020

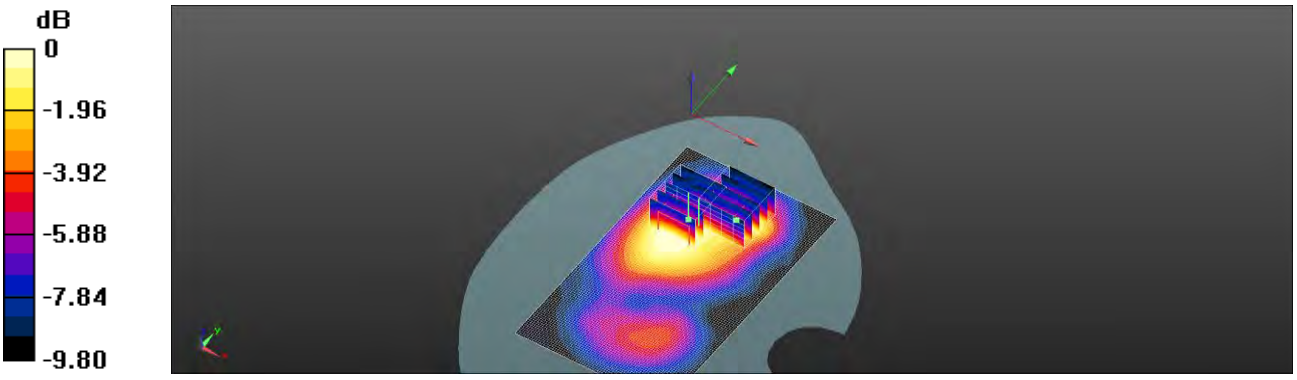
Report No. : E5/2020/40001
GSM 1900_Body-worn_Back side_CH 810_10mm
Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1910 MHz; σ = 1.428 S/m; ε_r = 39.064; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(8.07, 8.07, 8.07); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.705 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.411 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.824 W/kg
SAR(1 g) = 0.536 W/kg; SAR(10 g) = 0.346 W/kg
Smallest distance from peaks to all points 3 dB below = 21.5 mm
Ratio of SAR at M2 to SAR at M1 = 63.4%
Maximum value of SAR (measured) = 0.679 W/kg
Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.411 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.747 W/kg
SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.297 W/kg
Smallest distance from peaks to all points 3 dB below = 28.8 mm
Ratio of SAR at M2 to SAR at M1 = 63.3%
Maximum value of SAR (measured) = 0.607 W/kg



0 dB = 0.607 W/kg = -2.17 dBW/kg

Date: Apr. 19th, 2020

Report No. : E5/2020/40001
GPRS 1900_Hotspot_Back side_CH 661_10mm
Communication System: GPRS; Frequency: 1880 MHz; Duty Cycle: 1:4.10015
Medium parameters used: f = 1880 MHz; σ = 1.425 S/m; ε_r = 39.082; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6℃

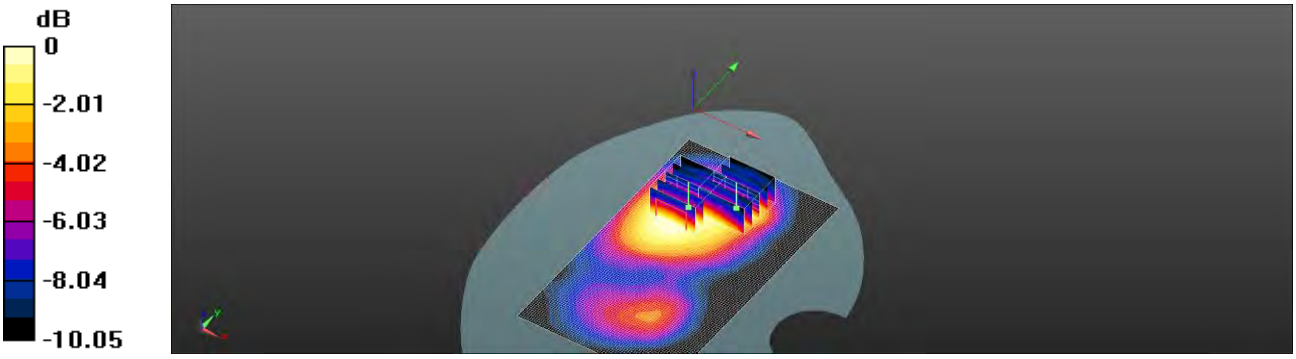
DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(8.07, 8.07, 8.07); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.773 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.410 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.936 W/kg
SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.383 W/kg
Smallest distance from peaks to all points 3 dB below = 23.1 mm
Ratio of SAR at M2 to SAR at M1 = 62.6%
Maximum value of SAR (measured) = 0.752 W/kg

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.410 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.839 W/kg
SAR(1 g) = 0.519 W/kg; SAR(10 g) = 0.341 W/kg
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 61.2%
Maximum value of SAR (measured) = 0.676 W/kg



0 dB = 0.676 W/kg = -1.70 dBW/kg

Date: Apr. 18th, 2020

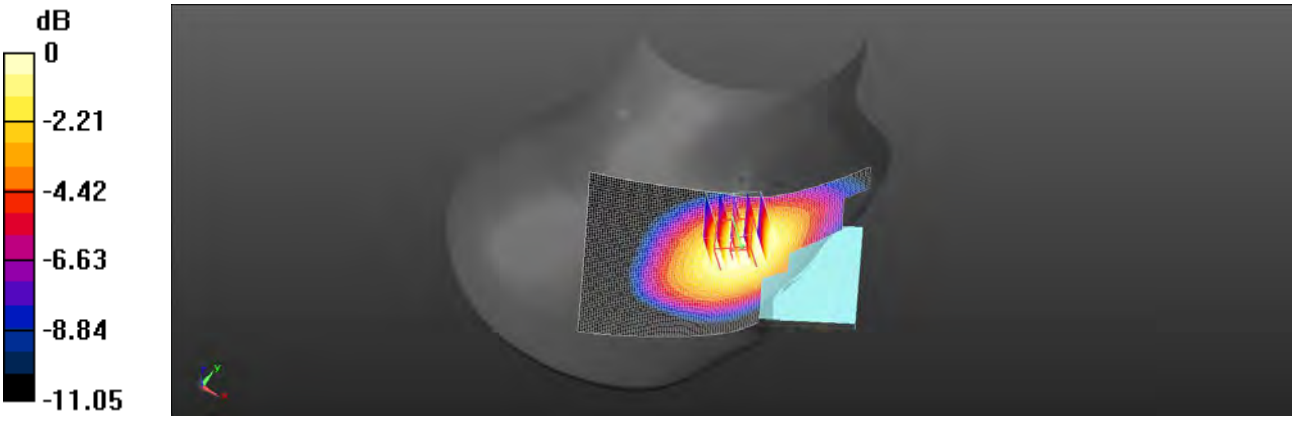
Report No. : E5/2020/40001
WCDMA Band V_Head_Re Cheek_CH 4233
Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium parameters used: f = 847 MHz; σ = 0.925 S/m; ε_r = 40.701; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.634 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.170 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.703 W/kg
SAR(1 g) = 0.555 W/kg; SAR(10 g) = 0.413 W/kg
Smallest distance from peaks to all points 3 dB below = 23.9 mm
Ratio of SAR at M2 to SAR at M1 = 78.9%
Maximum value of SAR (measured) = 0.642 W/kg



0 dB = 0.642 W/kg = -1.93 dBW/kg

Date: Apr. 18th, 2020

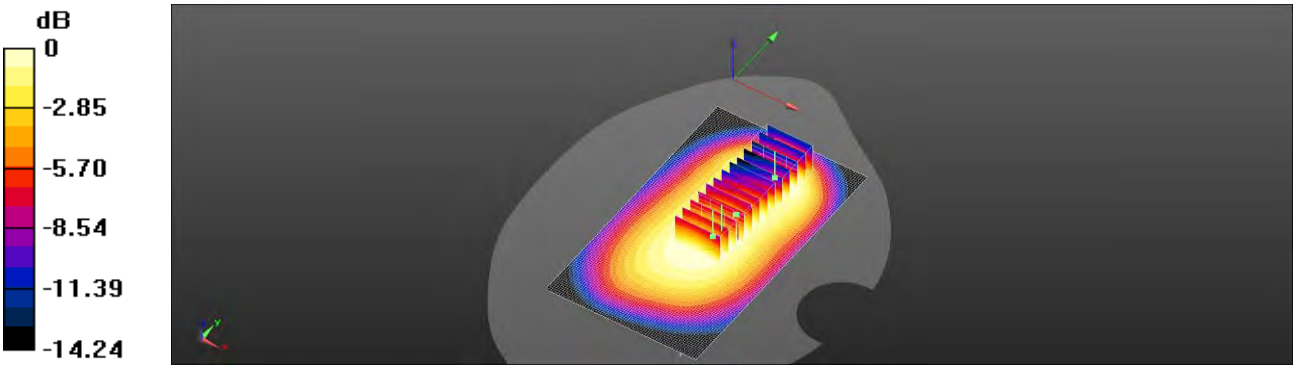
Report No. : E5/2020/40001
WCDMA Band V_Hotspot_Back sidek_CH 4132_10mm
Communication System: WCDMA ; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium parameters used: f = 826.4 MHz; σ = 0.911 S/m; ε_r = 40.755; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.721 W/kg

Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.52 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.721 W/kg
SAR(1 g) = 0.560 W/kg; SAR(10 g) = 0.417 W/kg
Smallest distance from peaks to all points 3 dB below = 8.5 mm
Ratio of SAR at M2 to SAR at M1 = 77.2%
Maximum value of SAR (measured) = 0.652 W/kg
Zoom Scan (5x5x7)/Cube 2: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.52 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.717 W/kg
SAR(1 g) = 0.553 W/kg; SAR(10 g) = 0.400 W/kg
Smallest distance from peaks to all points 3 dB below = 8.5 mm
Ratio of SAR at M2 to SAR at M1 = 77.2%
Maximum value of SAR (measured) = 0.650 W/kg



0 dB = 0.650 W/kg = -1.87 dBW/kg

Date: Apr. 18th, 2020

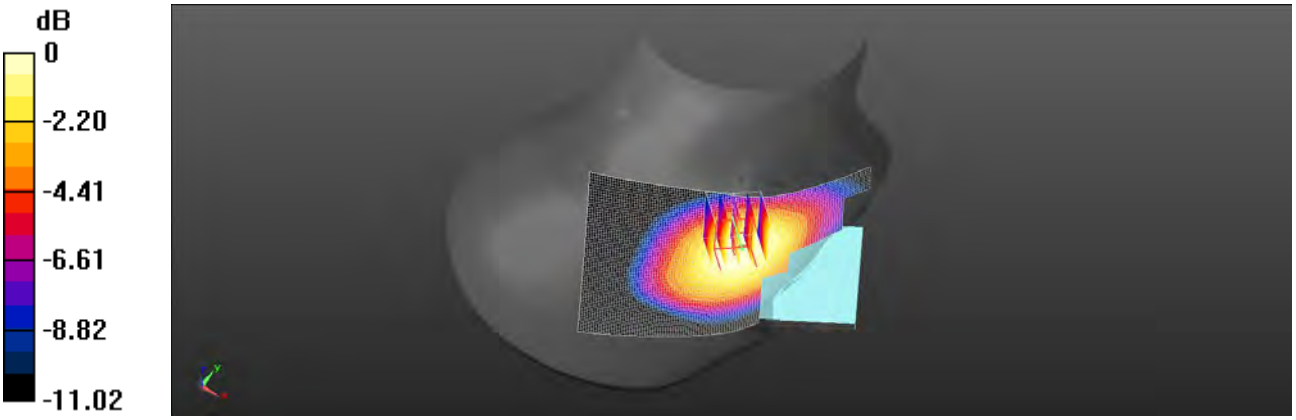
Report No. : E5/2020/40001
LTE Band 5 (10MHz)_Head_Re Cheek_CH 20600_QPSK_1-25
Communication System: LTE ; Frequency: 844 MHz; Duty Cycle: 1:1
Medium parameters used: f = 844 MHz; σ = 0.922 S/m; ε_r = 40.707; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.598 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.035 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.649 W/kg
SAR(1 g) = 0.500 W/kg; SAR(10 g) = 0.371 W/kg
Smallest distance from peaks to all points 3 dB below = 21.6 mm
Ratio of SAR at M2 to SAR at M1 = 78%
Maximum value of SAR (measured) = 0.583 W/kg



0 dB = 0.583 W/kg = -2.34 dBW/kg

Date: Apr. 18th, 2020

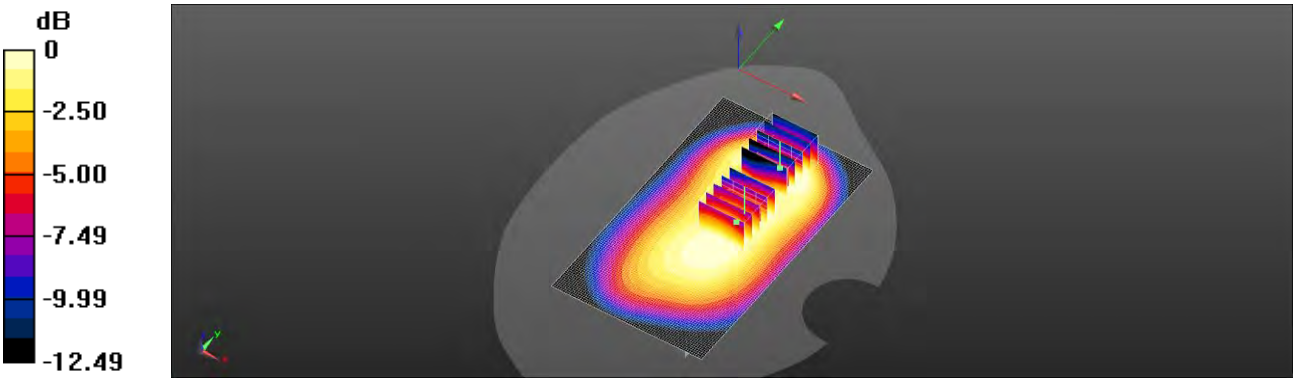
Report No. : E5/2020/40001
LTE Band 5 (10MHz)_Hotspot_Back sidek_CH 20600_QPSK_1-25_10mm
Communication System: LTE ; Frequency: 844 MHz; Duty Cycle: 1:1
Medium parameters used: f = 844 MHz; σ = 0.922 S/m; ε_r = 40.707; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.783 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.27 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.592 W/kg; SAR(10 g) = 0.330 W/kg
Smallest distance from peaks to all points 3 dB below = 11.2 mm
Ratio of SAR at M2 to SAR at M1 = 57.3%
Maximum value of SAR (measured) = 0.837 W/kg
Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.27 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.641 W/kg
SAR(1 g) = 0.487 W/kg; SAR(10 g) = 0.354 W/kg
Smallest distance from peaks to all points 3 dB below = 11.2 mm
Ratio of SAR at M2 to SAR at M1 = 75.5%
Maximum value of SAR (measured) = 0.576 W/kg



0 dB = 0.576 W/kg = -2.39 dBW/kg

Date: Apr. 17th, 2020

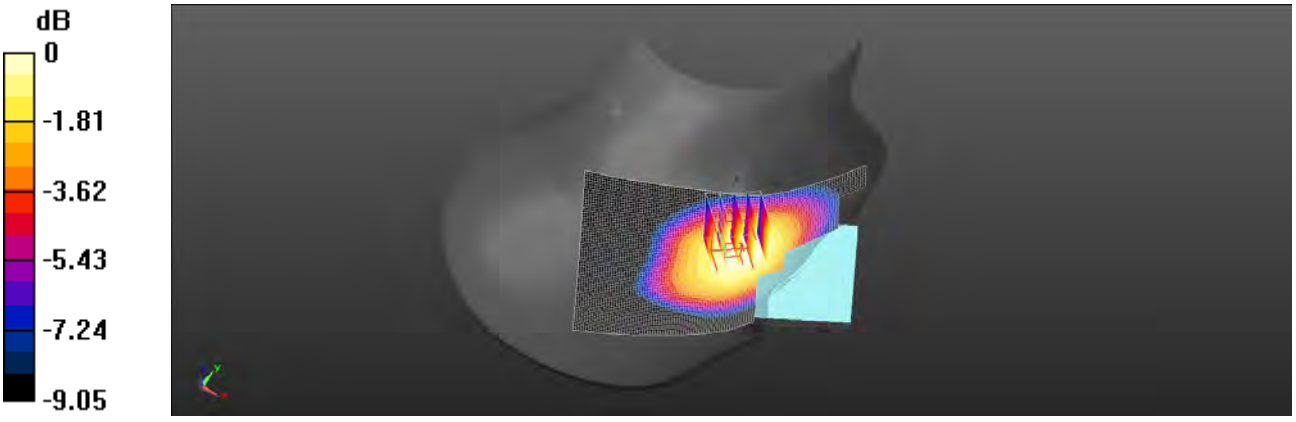
Report No. : E5/2020/40001
LTE Band 12 (10MHz)_Head_Re Cheek_CH 23130_QPSK_1-25
Communication System: LTE ; Frequency: 711 MHz; Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.901 S/m; ε_r = 41.504; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.72, 9.72, 9.72) @ 711 MHz; Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0818 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.494 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.0880 W/kg
SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.057 W/kg
Ratio of SAR at M2 to SAR at M1 = 83.8%
Maximum value of SAR (measured) = 0.0823 W/kg



0 dB = 0.0823 W/kg = -10.84 dBW/kg

Date: Apr. 17th, 2020

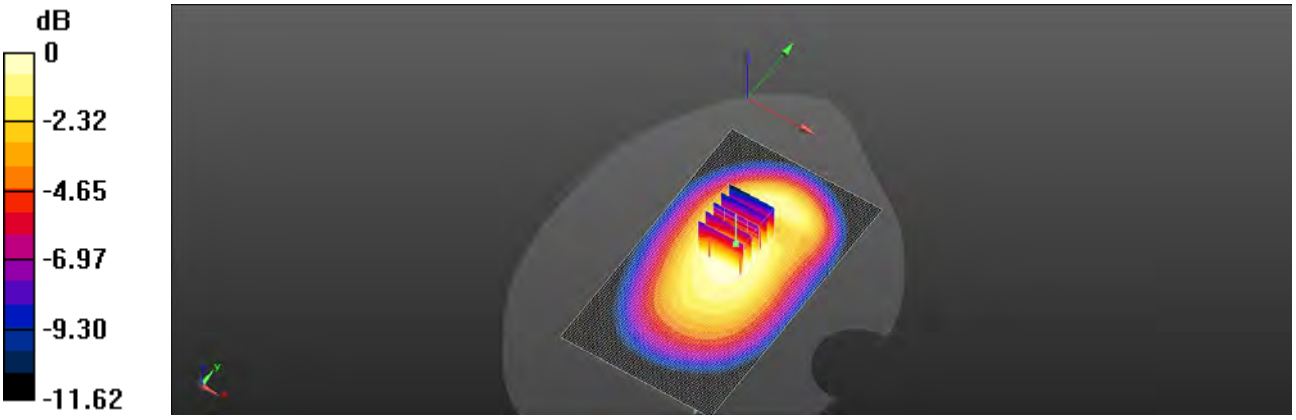
Report No. : E5/2020/40001
LTE Band 12 (10MHz)_Hotspot_Back sidek_CH 23130_QPSK_1-25_10mm
Communication System: LTE ; Frequency: 711 MHz; Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.901 S/m; ε_r = 41.504; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.72, 9.72, 9.72); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.146 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.84 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.161 W/kg
SAR(1 g) = 0.124 W/kg; SAR(10 g) = 0.091 W/kg
Ratio of SAR at M2 to SAR at M1 = 75.2%
Maximum value of SAR (measured) = 0.144 W/kg



0 dB = 0.144 W/kg = -8.41 dBW/kg

Date: Apr. 17th, 2020

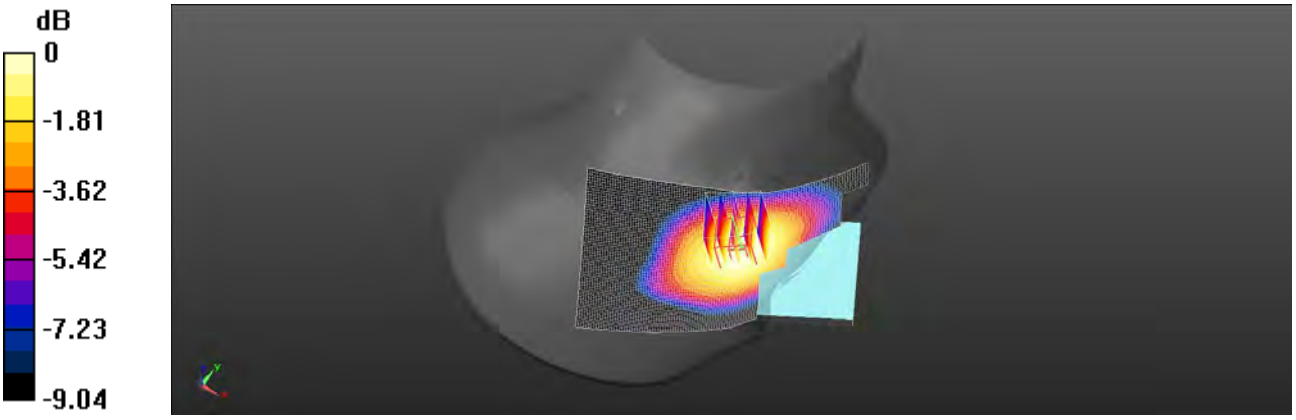
Report No. : E5/2020/40001
LTE Band 17 (10MHz)_Head_Re Cheek_CH 23800_QPSK_1-49
Communication System: LTE ; Frequency: 711 MHz; Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.901 S/m; ε_r = 41.504; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.72, 9.72, 9.72); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0814 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.346 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.0890 W/kg
SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.057 W/kg
Ratio of SAR at M2 to SAR at M1 = 83%
Maximum value of SAR (measured) = 0.0823 W/kg



0 dB = 0.0823 W/kg = -10.85 dBW/kg

Date: Apr. 17th, 2020

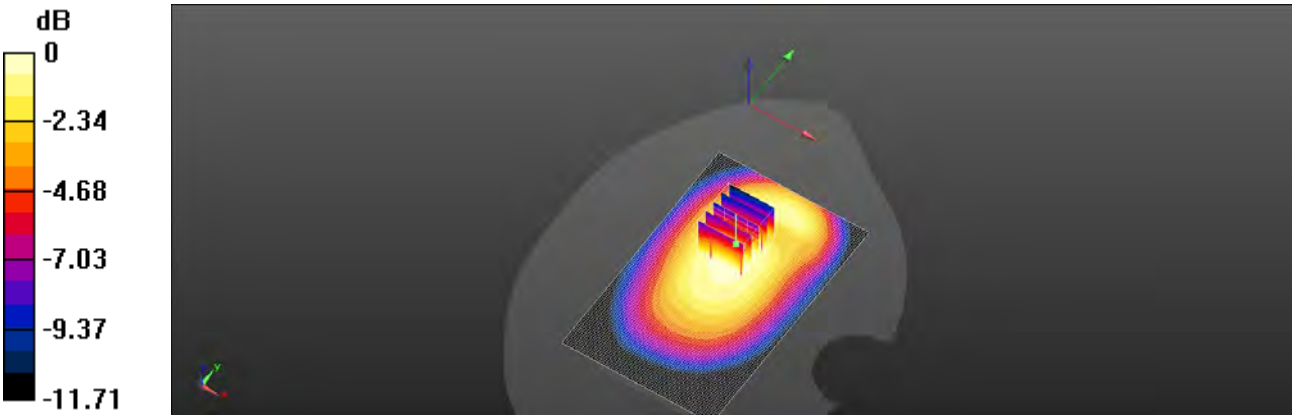
Report No. : E5/2020/40001
LTE Band 17 (10MHz)_Hotspot_Back sidek_CH 23800_QPSK_1-49_10mm
Communication System: LTE ; Frequency: 711 MHz; Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.901 S/m; ε_r = 41.504; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.72, 9.72, 9.72); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x111x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.149 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.87 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.170 W/kg
SAR(1 g) = 0.126 W/kg; SAR(10 g) = 0.092 W/kg
Ratio of SAR at M2 to SAR at M1 = 74.1%
Maximum value of SAR (measured) = 0.150 W/kg



0 dB = 0.150 W/kg = -8.23 dBW/kg

Date: Apr. 20th, 2020

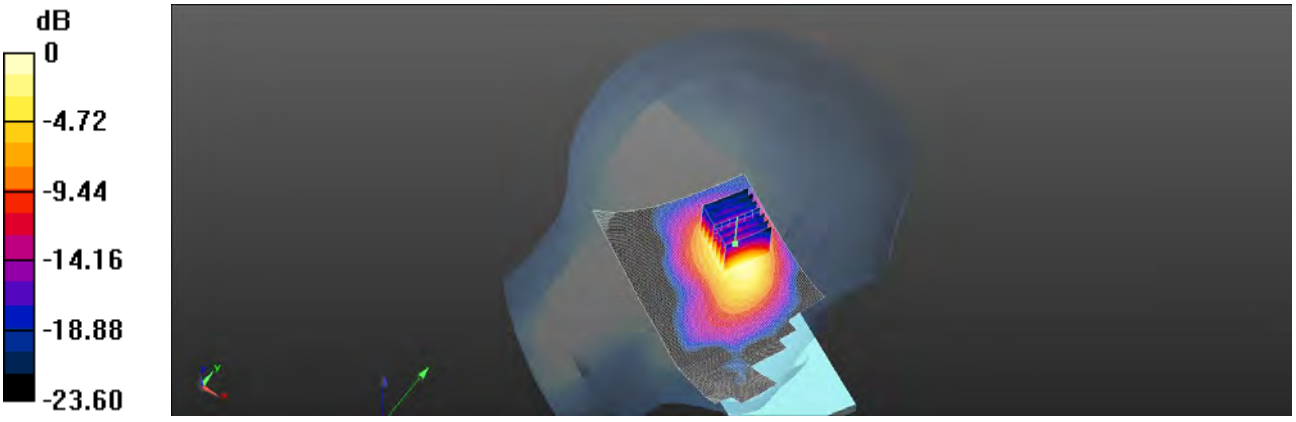
Report No. : E5/2020/40001
WLAN 802.11b_Head_Le Cheek_CH 10
Communication System: WLAN ; Frequency: 2457 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2457 MHz; σ = 1.848 S/m; ε_r = 38.122; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.59, 7.59, 7.59); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (81x151x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.774 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.273 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.981 W/kg
SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.227 W/kg
Smallest distance from peaks to all points 3 dB below = 10.1 mm
Ratio of SAR at M2 to SAR at M1 = 49%
Maximum value of SAR (measured) = 0.727 W/kg



0 dB = 0.727 W/kg = -1.38 dBW/kg

Date: Apr. 20th, 2020

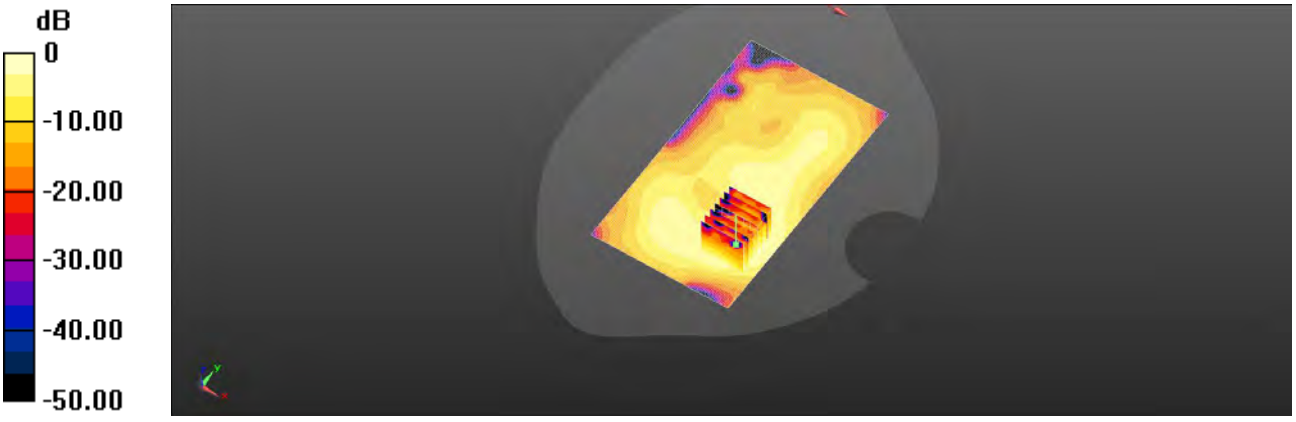
Report No. : E5/2020/40001
WLAN 802.11b_Hotspot_Back sidek_CH 10_10mm
Communication System: WLAN; Frequency: 2457 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2457 MHz; σ = 1.848 S/m; ε_r = 38.122; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.59, 7.59, 7.59); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (81x141x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.122 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.116 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.153 W/kg
SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.035 W/kg
Smallest distance from peaks to all points 3 dB below = 11.1 mm
Ratio of SAR at M2 to SAR at M1 = 48%
Maximum value of SAR (measured) = 0.110 W/kg



0 dB = 0.110 W/kg = -9.58 dBW/kg

Date: Apr. 20th, 2020

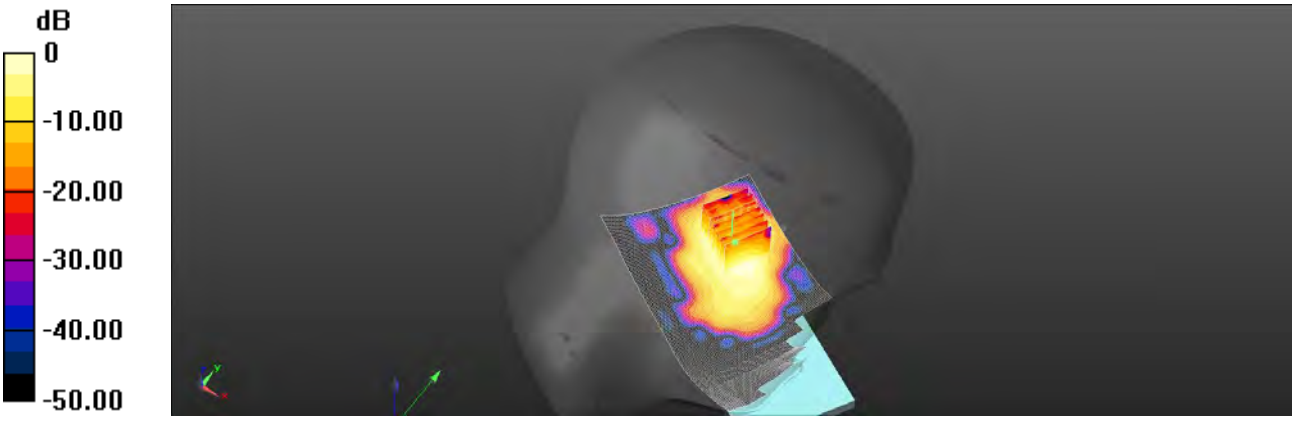
Report No. : E5/2020/40001
Bluetooth(GFSK)_Head_Le Cheek_CH 78
Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2480 MHz; σ = 1.866 S/m; ε_r = 38.098; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.59, 7.59, 7.59); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (81x141x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.128 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.605 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.166 W/kg
SAR(1 g) = 0.082 W/kg; SAR(10 g) = 0.038 W/kg
Smallest distance from peaks to all points 3 dB below = 9.9 mm
Ratio of SAR at M2 to SAR at M1 = 48.5%
Maximum value of SAR (measured) = 0.121 W/kg



0 dB = 0.121 W/kg = -9.17 dBW/kg

Date: Apr. 20th, 2020

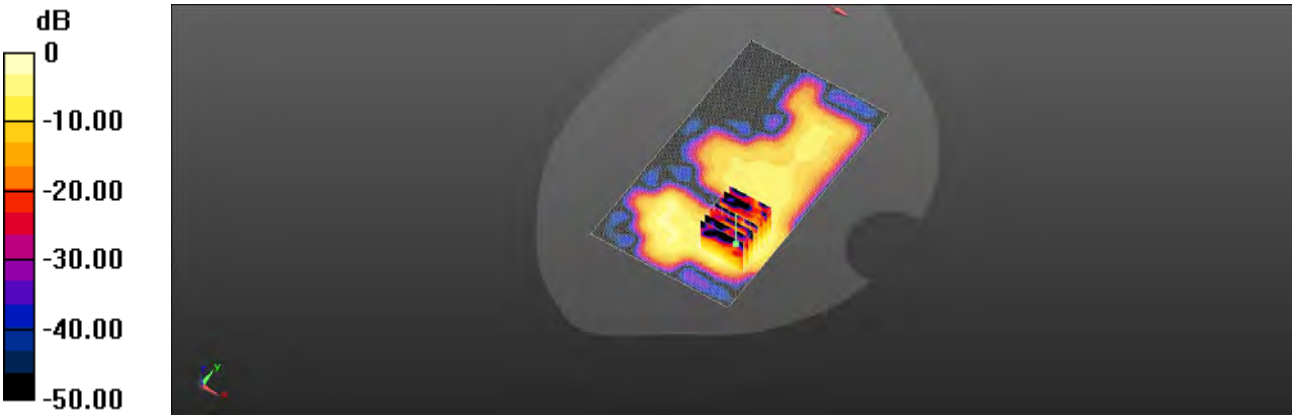
Report No. : E5/2020/40001
Bluetooth(GFSK)_Body-worn_Back side_CH 78_10mm
Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2480 MHz; σ = 1.866 S/m; ε_r = 38.098; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.59, 7.59, 7.59); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (81x141x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.0334 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.879 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.0840 W/kg
SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.016 W/kg
Ratio of SAR at M2 to SAR at M1 = 45.6%
Maximum value of SAR (measured) = 0.0573 W/kg



0 dB = 0.0573 W/kg = -12.42 dBW/kg

Date: Apr. 21st, 2020

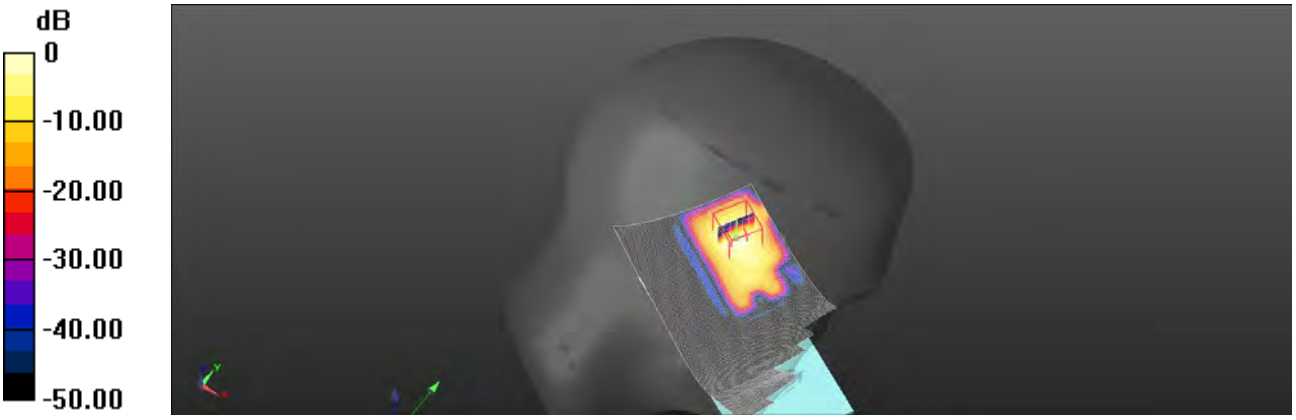
Report No. : E5/2020/40001
WLAN 802.11a 5.2G_Head_Le Cheek_CH 36
Communication System: IEEE 802.11a; Frequency: 5180 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; σ = 4.556 S/m; ε_r = 34.827; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (91x171x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.546 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.7570 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.294 W/kg; SAR(10 g) = 0.079 W/kg
Smallest distance from peaks to all points 3 dB below = 6.9 mm
Ratio of SAR at M2 to SAR at M1 = 53.5%
Maximum value of SAR (measured) = 0.631 W/kg



0 dB = 0.631 W/kg = -2.00 dBW/kg

Date: Apr. 21st, 2020

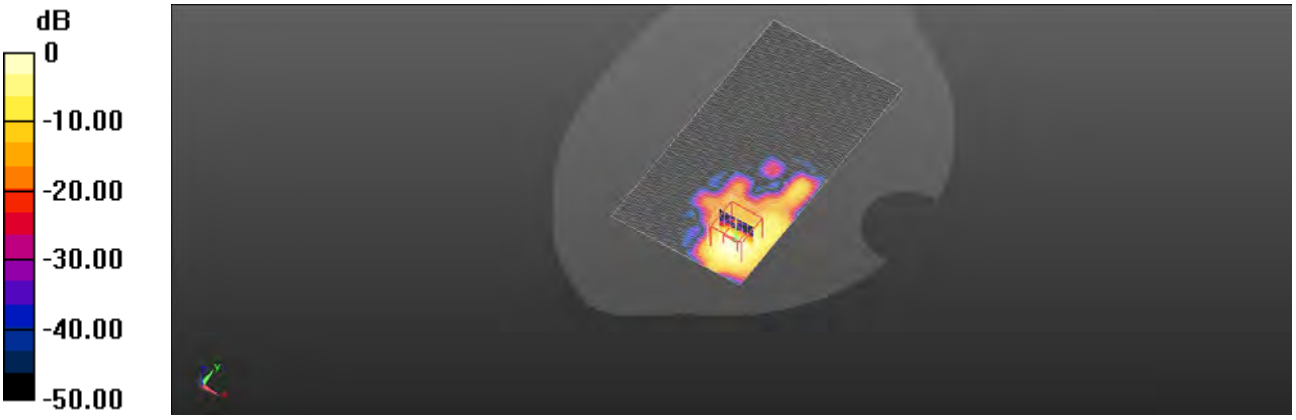
Report No. : E5/2020/40001
WLAN 802.11a 5.2G_Body-worn_Back side_CH 36_10mm
Communication System: IEEE 802.11a; Frequency: 5180 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; σ = 4.556 S/m; ε_r = 34.827; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (91x171x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.344 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.630 W/kg
SAR(1 g) = 0.154 W/kg; SAR(10 g) = 0.041 W/kg
Smallest distance from peaks to all points 3 dB below = 6.9 mm
Ratio of SAR at M2 to SAR at M1 = 50.6%
Maximum value of SAR (measured) = 0.345 W/kg



0 dB = 0.345 W/kg = -4.62 dBW/kg

Date: Apr. 22nd, 2020

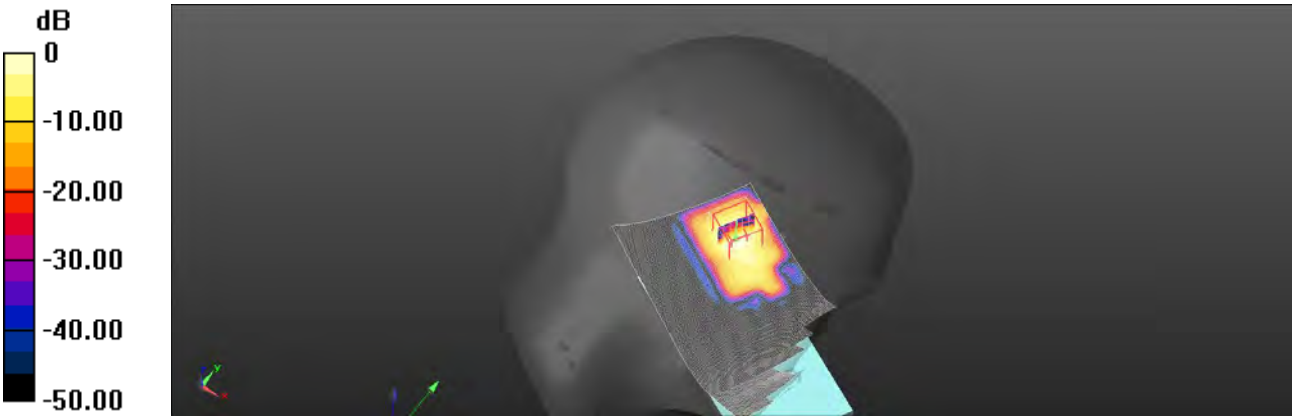
Report No. : E5/2020/40001
WLAN 802.11ac(80M) 5.3G_Head_Le Cheek_CH 58
Communication System: WLAN; Frequency: 5290 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5290 MHz; σ = 4.662 S/m; ε_r = 34.616; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (91x171x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.382 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.412 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.923 W/kg
SAR(1 g) = 0.200 W/kg; SAR(10 g) = 0.053 W/kg
Smallest distance from peaks to all points 3 dB below = 6.6 mm
Ratio of SAR at M2 to SAR at M1 = 49.9%
Maximum value of SAR (measured) = 0.431 W/kg



0 dB = 0.431 W/kg = -3.66 dBW/kg

Date: Apr. 22nd, 2020

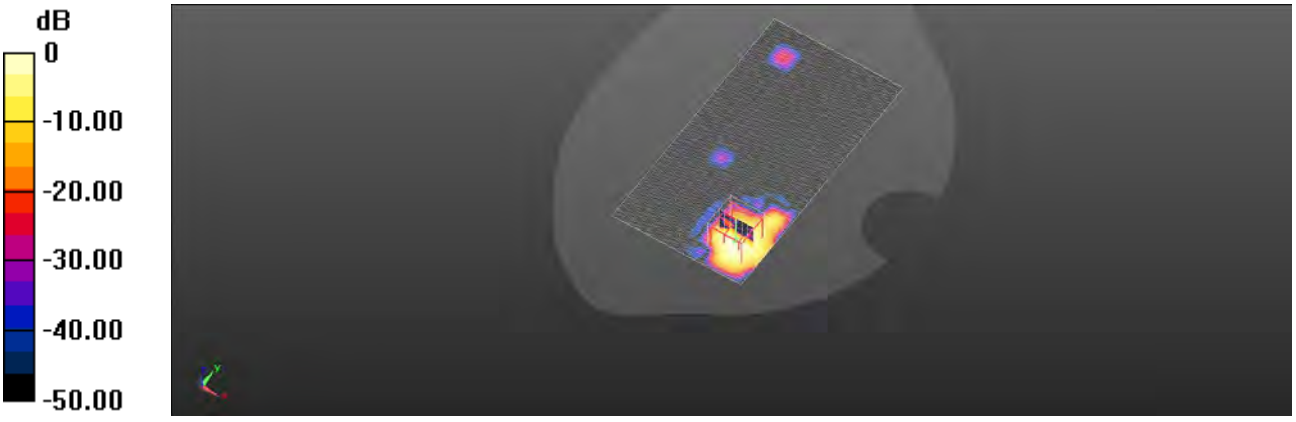
Report No. : E5/2020/40001
WLAN 802.11ac(80M) 5.3G_Body-worn_Back side_CH 58_10mm
Communication System: WLAN; Frequency: 5290 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5290 MHz; σ = 4.662 S/m; ε_r = 34.616; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (91x171x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.247 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.759 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.427 W/kg
SAR(1 g) = 0.099 W/kg; SAR(10 g) = 0.025 W/kg
Smallest distance from peaks to all points 3 dB below = 6.6 mm
Ratio of SAR at M2 to SAR at M1 = 48.5%
Maximum value of SAR (measured) = 0.230 W/kg



0 dB = 0.230 W/kg = -6.38 dBW/kg

Date: Apr. 23rd, 2020

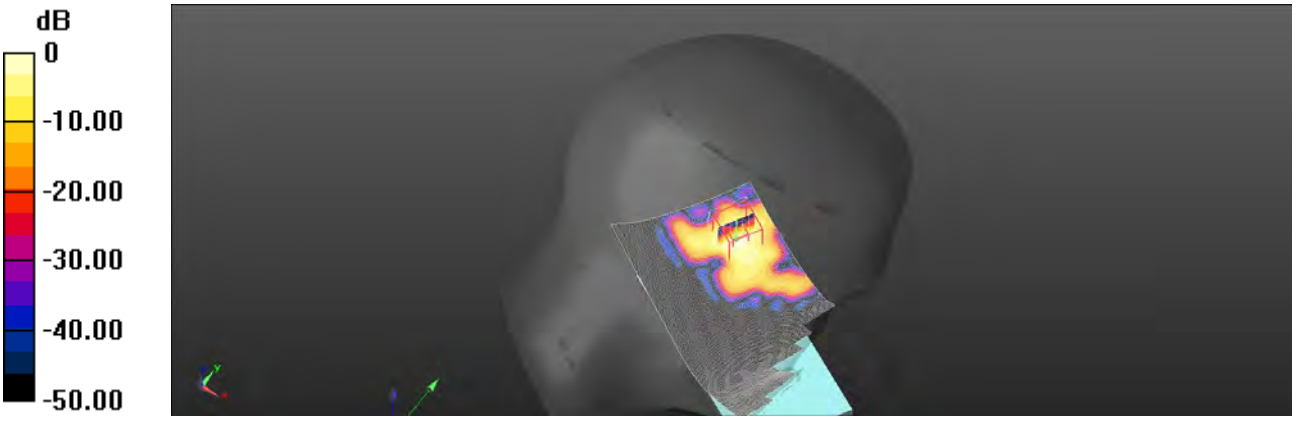
Report No. : E5/2020/40001
WLAN 802.11ac(80M) 5.6G_Head_Le Cheek_CH 106
Communication System: WLAN; Frequency: 5530 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5530 MHz; σ = 4.888 S/m; ε_r = 34.327; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.7, 4.7, 4.7); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (91x171x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.444 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.098 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.208 W/kg; SAR(10 g) = 0.055 W/kg
Smallest distance from peaks to all points 3 dB below = 6.4 mm
Ratio of SAR at M2 to SAR at M1 = 49.5%
Maximum value of SAR (measured) = 0.443 W/kg



0 dB = 0.443 W/kg = -3.54 dBW/kg

Date: Apr. 23rd, 2020

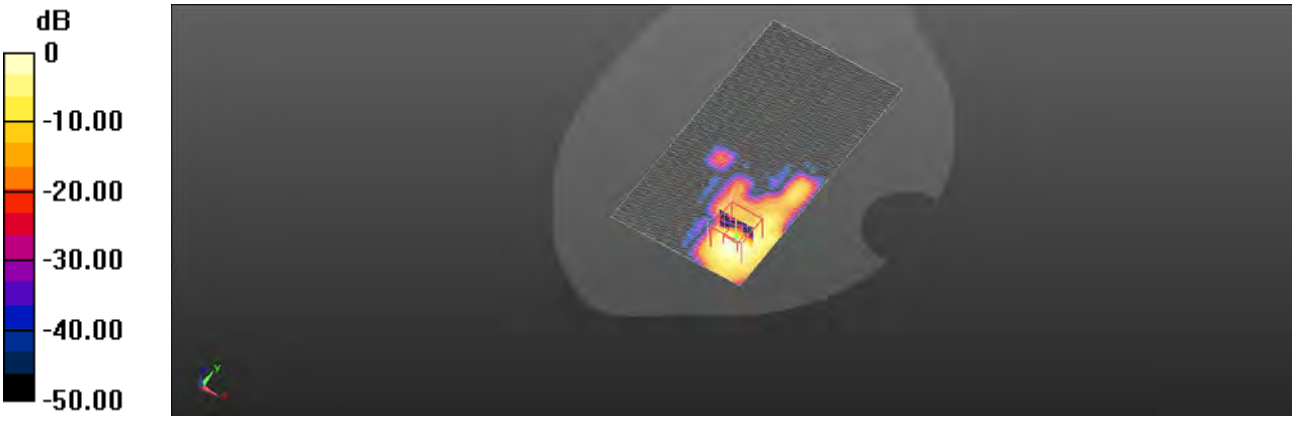
Report No. : E5/2020/40001
WLAN 802.11ac(80M) 5.6G_Body-worn_Back side_CH 106_10mm
Communication System: WLAN; Frequency: 5530 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5530 MHz; σ = 4.888 S/m; ε_r = 34.327; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.7, 4.7, 4.7); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (91x171x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 0.376 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.441 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.173 W/kg; SAR(10 g) = 0.046 W/kg
Smallest distance from peaks to all points 3 dB below = 6.8 mm
Ratio of SAR at M2 to SAR at M1 = 50.4%
Maximum value of SAR (measured) = 0.381 W/kg



0 dB = 0.381 W/kg = -4.20 dBW/kg

6. SAR System Performance Verification

Date: Apr. 17th, 2020

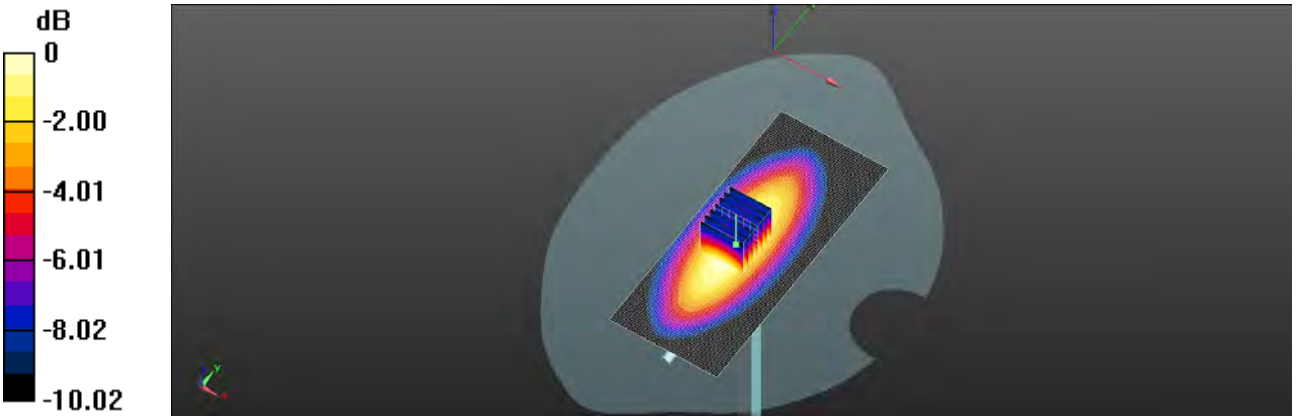
Report No. : E5/2020/40001
Dipole 750 MHz_SN:1015
Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.902 S/m; ε_r = 41.308; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.72, 9.72, 9.72); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (51x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 2.54 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.27 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.00 W/kg
SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.44 W/kg
Smallest distance from peaks to all points 3 dB below = 5.5 mm
Ratio of SAR at M2 to SAR at M1 = 67.5%
Maximum value of SAR (measured) = 2.55 W/kg



0 dB = 2.55 W/kg = 4.06 dBW/kg

Date: Apr. 18th, 2020

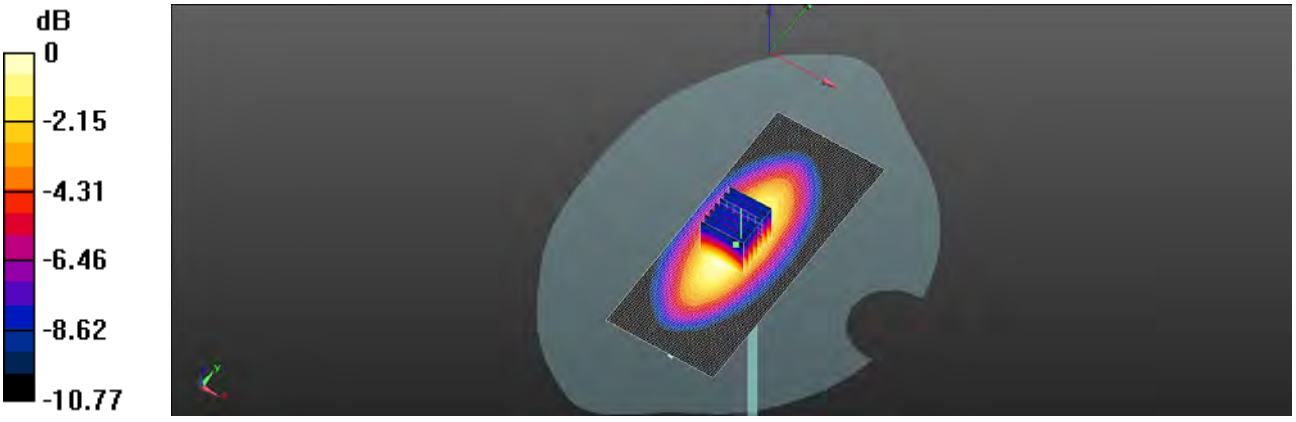
Report No. : E5/2020/40001
Dipole 835 MHz_SN:4d063
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.913 S/m; ε_r = 40.741; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(9.48, 9.48, 9.48); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (51x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 2.97 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.27 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.43 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.53 W/kg
Smallest distance from peaks to all points 3 dB below = 19.4 mm
Ratio of SAR at M2 to SAR at M1 = 67.5%
Maximum value of SAR (measured) = 2.95 W/kg



0 dB = 2.95 W/kg = 4.70 dBW/kg

Date: Apr. 19th, 2020

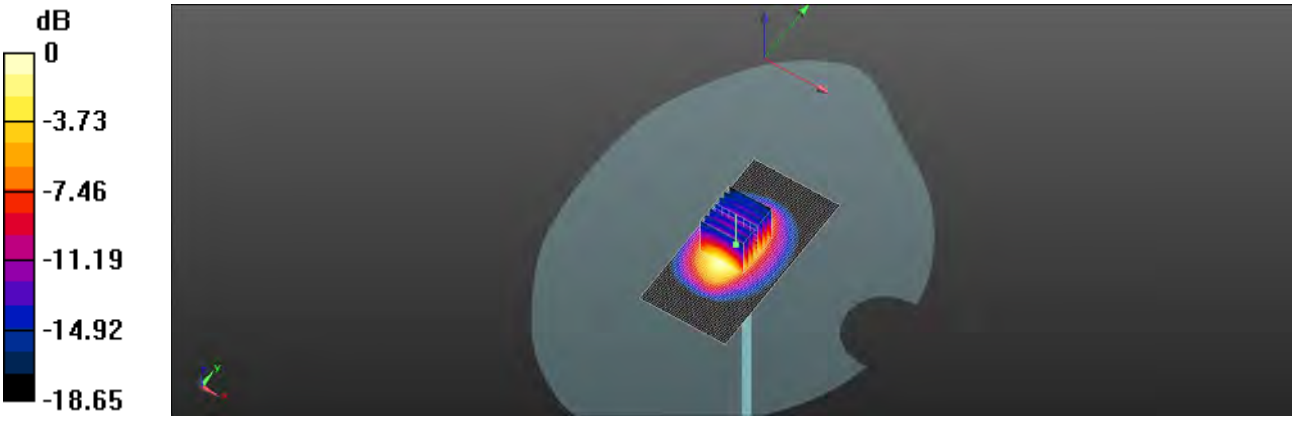
Report No. : E5/2020/40001
Dipole 1900 MHz_SN:5d173
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.427 S/m; ε_r = 39.08; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.6℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(8.07, 8.07, 8.07); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (41x81x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 13.1 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.82 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 17.0 W/kg
SAR(1 g) = 9.92 W/kg; SAR(10 g) = 5.26 W/kg
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 52.7%
Maximum value of SAR (measured) = 13.0 W/kg



0 dB = 13.0 W/kg = 11.13 dBW/kg

Date: Apr. 20th, 2020

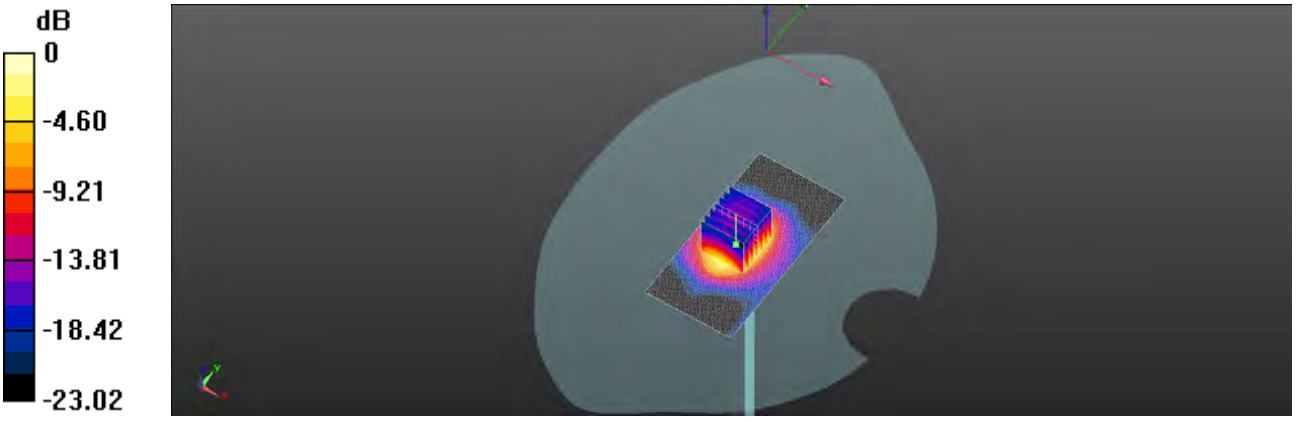
Report No. : E5/2020/40001
Dipole 2450 MHz_SN:727
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.839 S/m; ε_r = 38.125; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.4°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(7.59, 7.59, 7.59); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (51x101x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 17.5 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.70 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 23.9 W/kg
SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.27 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 45.5%
Maximum value of SAR (measured) = 17.1 W/kg



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

Date: Apr. 21st, 2020

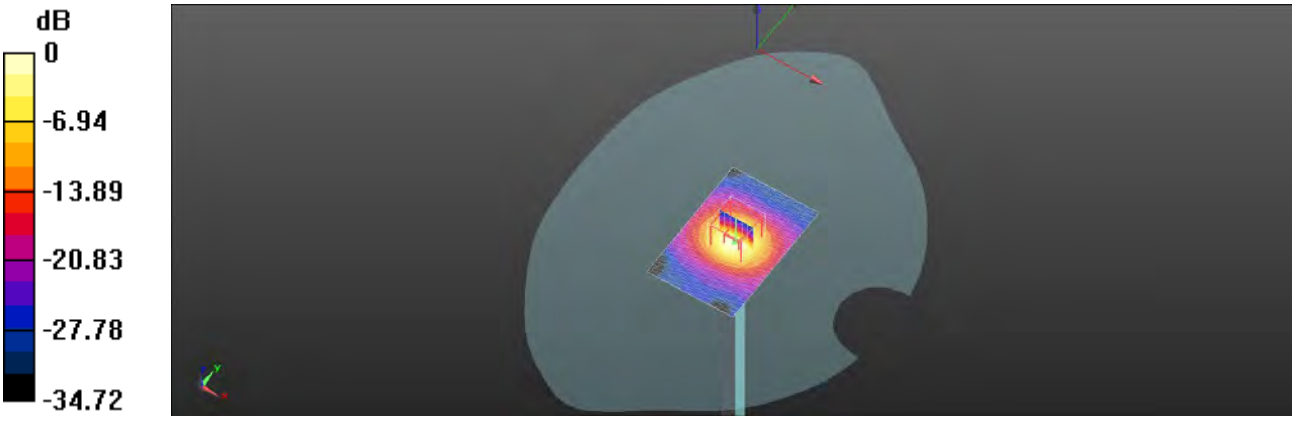
Report No. : E5/2020/40001
Dipole 5200 MHz_SN:1023
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 4.576 S/m; ε_r = 34.805; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 13.7 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 56.41 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 26.0 W/kg
SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.27 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 55.7%
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.36 dBW/kg

Date: Apr. 22nd, 2020

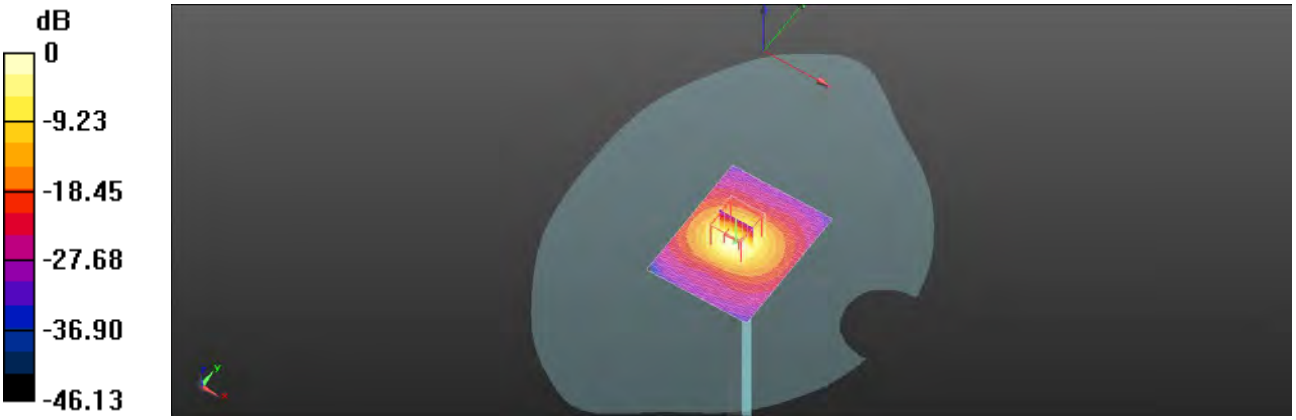
Report No. : E5/2020/40001
Dipole 5300 MHz_SN:1023
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 4.671 S/m; ε_r = 34.613; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.3°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(5, 5, 5); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (71x91x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 14.1 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 54.83 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 22.8 W/kg
SAR(1 g) = 8.36 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 7.5 mm
Ratio of SAR at M2 to SAR at M1 = 59.8%
Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 13.4 W/kg = 11.27 dBW/kg

Date: Apr. 23rd, 2020

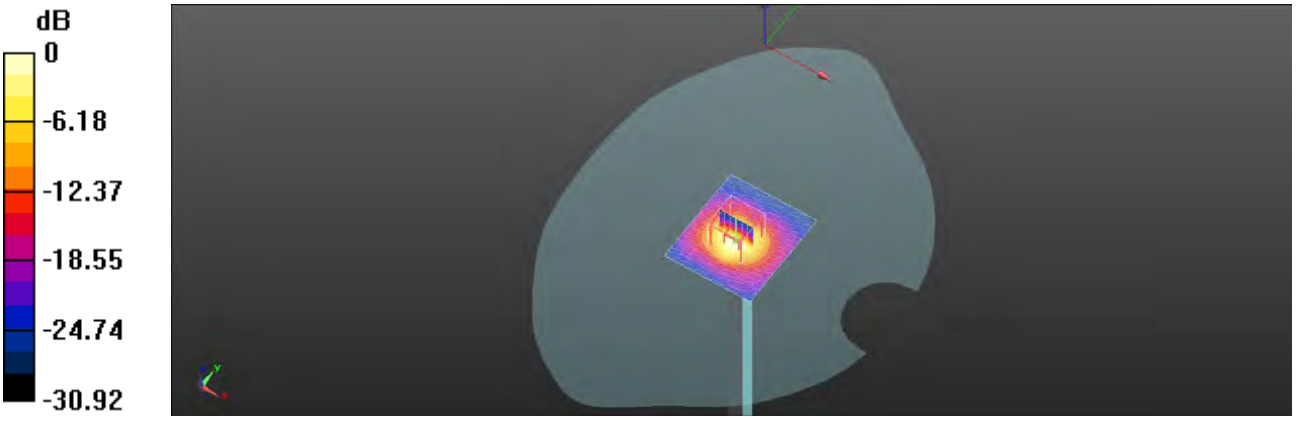
Report No. : E5/2020/40001
Dipole 5600 MHz_SN:1023
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 4.958 S/m; ε_r = 34.242; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient temperature: 22.1°C; Liquid temperature: 21.5℃

DASY5 Configuration:

- Probe: EX3DV4 - SN3938; ConvF(4.7, 4.7, 4.7); Calibrated: 2020/2/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn917; Calibrated: 2019/12/17
- Phantom: SAM
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Area Scan (61x71x1): Interpolated grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 12.2 W/kg

Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 51.18 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 23.4 W/kg
SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.33 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 55.4%
Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2 W/kg = 10.86 dBW/kg

7. Uncertainty Budget

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

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.55%	N	1	1	1	1	6.55%	6.55%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	3.62%	N	1	1	0.64	0.43	2.32%	1.56%	M
Liquid Conductivity (mea.)	2.16%	N	1	1	0.6	0.49	1.30%	1.06%	M
Combined standard uncertainty		RSS					12.01%	11.86%	
Expant uncertainty (95% confidence							24.03%	23.71%	

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

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
Isotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
Isotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	2.74%	N	1	1	0.64	0.43	1.75%	1.18%	M
Liquid Conductivity (mea.)	2.26%	N	1	1	0.6	0.49	1.36%	1.11%	M
Combined standard uncertainty		RSS					11.63%	11.52%	
Expant uncertainty (95% confidence							23.26%	23.04%	

Appendixes

Refer to separated files for the following appendixes.

E5202040001 SAR_Appendix A Photographs

E5202040001 SAR_Appendix B DAE & Probe Cal. Certificate

E5202040001 SAR_Appendix C Phantom Description & Dipole Cal. Certificate

- End of report -