Full Power								
LTE Band 41 PC2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	2685.0	25.63	24.83	23.88	26.5	25.5	24.5
		2639.0	25.36	24.49	23.73	26.5	25.5	24.5
		2593.0	25.33	24.64	23.62	26.5	25.5	24.5
		2547.0	25.45	24.56	23.51	26.5	25.5	24.5
		2501.0	25.33	24.61	23.32	26.5	25.5	24.5
	1RB_24	2685.0	25.69	24.88	23.82	26.5	25.5	24.5
		2639.0	25.28	24.52	23.58	26.5	25.5	24.5
		2593.0	25.29	24.58	23.75	26.5	25.5	24.5
		2547.0	25.27	24.64	23.29	26.5	25.5	24.5
		2501.0	25.42	24.79	23.59	26.5	25.5	24.5
	1RB_0	2685.0	25.60	24.98	23.97	26.5	25.5	24.5
		2639.0	25.42	24.53	23.59	26.5	25.5	24.5
		2593.0	25.63	24.91	23.88	26.5	25.5	24.5
		2547.0	25.47	24.86	23.43	26.5	25.5	24.5
		2501.0	25.60	24.76	23.63	26.5	25.5	24.5
	25RB_25	2685.0	24.61	23.91	22.85	25.5	24.5	23.5
		2639.0	24.45	23.34	22.56	25.5	24.5	23.5
		2593.0	24.44	23.52	22.49	25.5	24.5	23.5
		2547.0	24.28	23.50	22.35	25.5	24.5	23.5
		2501.0	24.44	23.52	22.62	25.5	24.5	23.5
	25RB_12	2685.0	24.84	23.94	22.83	25.5	24.5	23.5
		2639.0	24.70	23.61	22.47	25.5	24.5	23.5
		2593.0	24.70	23.69	22.62	25.5	24.5	23.5
		2547.0	24.44	23.36	22.45	25.5	24.5	23.5
		2501.0	24.66	23.66	22.69	25.5	24.5	23.5
	25RB_0	2685.0	24.94	23.88	22.82	25.5	24.5	23.5
		2639.0	24.46	23.44	22.35	25.5	24.5	23.5
		2593.0	24.70	23.66	22.62	25.5	24.5	23.5
		2547.0	24.38	23.35	22.31	25.5	24.5	23.5
		2501.0	24.53	23.50	22.61	25.5	24.5	23.5
	50RB_0	2685.0	24.92	23.88	22.54	25.5	24.5	23.5
		2639.0	24.67	23.65	22.28	25.5	24.5	23.5
		2593.0	24.60	23.72	22.65	25.5	24.5	23.5
		2547.0	24.57	23.31	22.37	25.5	24.5	23.5
		2501.0	24.58	23.64	22.43	25.5	24.5	23.5

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Full Power								
LTE Band 41 PC2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	2682.5	25.41	24.45	23.33	26.5	25.5	24.5
		2637.8	24.76	24.09	23.73	26.5	25.5	24.5
		2593.0	24.96	24.22	23.82	26.5	25.5	24.5
		2548.3	24.85	24.13	23.12	26.5	25.5	24.5
		2503.5	24.62	24.07	23.01	26.5	25.5	24.5
	1RB_37	2682.5	25.55	24.64	23.51	26.5	25.5	24.5
		2637.8	25.06	24.30	23.99	26.5	25.5	24.5
		2593.0	25.23	24.56	23.63	26.5	25.5	24.5
		2548.3	25.15	24.44	23.41	26.5	25.5	24.5
		2503.5	25.05	24.34	23.29	26.5	25.5	24.5
	1RB_0	2682.5	25.25	24.40	23.25	26.5	25.5	24.5
		2637.8	25.13	24.40	23.66	26.5	25.5	24.5
		2593.0	25.17	24.47	23.00	26.5	25.5	24.5
		2548.3	24.99	24.30	23.25	26.5	25.5	24.5
		2503.5	25.16	24.46	23.38	26.5	25.5	24.5
	36RB_38	2682.5	24.36	23.32	22.32	25.5	24.5	23.5
		2637.8	24.00	23.05	22.22	25.5	24.5	23.5
		2593.0	24.17	23.25	22.71	25.5	24.5	23.5
		2548.3	24.04	23.12	22.30	25.5	24.5	23.5
		2503.5	24.08	23.07	22.41	25.5	24.5	23.5
	36RB_19	2682.5	24.42	23.42	22.59	25.5	24.5	23.5
		2637.8	24.20	23.25	22.42	25.5	24.5	23.5
		2593.0	24.34	23.42	22.79	25.5	24.5	23.5
		2548.3	24.15	23.24	22.39	25.5	24.5	23.5
		2503.5	24.13	23.21	22.35	25.5	24.5	23.5
	36RB_0	2682.5	24.30	23.31	22.50	25.5	24.5	23.5
		2637.8	24.20	23.25	22.33	25.5	24.5	23.5
		2593.0	24.38	23.45	22.76	25.5	24.5	23.5
		2548.3	24.16	23.24	22.40	25.5	24.5	23.5
		2503.5	24.28	23.35	22.47	25.5	24.5	23.5
	75RB_0	2682.5	24.33	23.38	22.56	25.5	24.5	23.5
		2637.8	24.15	23.23	22.42	25.5	24.5	23.5
		2593.0	24.26	23.38	22.64	25.5	24.5	23.5
		2548.3	24.05	23.16	22.30	25.5	24.5	23.5
		2503.5	24.09	23.20	22.31	25.5	24.5	23.5

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Full Power								
LTE Band 41 PC2			Actual output Power (dBm)			**Tune up**		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	2680.0	25.33	24.53	23.36	**26.5**	**25.5**	**24.5**
		2636.5	24.88	24.04	23.00	**26.5**	**25.5**	**24.5**
		2593.0	25.15	24.34	23.47	**26.5**	**25.5**	**24.5**
		2549.5	24.97	24.20	23.10	**26.5**	**25.5**	**24.5**
		2506.0	24.59	24.03	23.09	**26.5**	**25.5**	**24.5**
	1RB_50	2680.0	**25.61**	24.81	23.63	**26.5**	**25.5**	**24.5**
		2636.5	25.23	24.41	23.45	**26.5**	**25.5**	**24.5**
		2593.0	25.43	24.64	23.74	**26.5**	**25.5**	**24.5**
		2549.5	25.31	24.54	23.47	**26.5**	**25.5**	**24.5**
		2506.0	25.06	24.29	23.21	**26.5**	**25.5**	**24.5**
	1RB_0	2680.0	25.19	24.33	23.69	**26.5**	**25.5**	**24.5**
		2636.5	25.43	24.62	23.88	**26.5**	**25.5**	**24.5**
		2593.0	25.44	24.65	23.70	**26.5**	**25.5**	**24.5**
		2549.5	25.17	24.42	23.32	**26.5**	**25.5**	**24.5**
		2506.0	25.27	24.55	23.40	**26.5**	**25.5**	**24.5**
	50RB_50	2680.0	24.49	23.51	22.42	**25.5**	**24.5**	**23.5**
		2636.5	24.21	23.22	22.26	**25.5**	**24.5**	**23.5**
		2593.0	24.35	23.40	22.60	**25.5**	**24.5**	**23.5**
		2549.5	24.15	23.22	22.33	**25.5**	**24.5**	**23.5**
		2506.0	24.03	23.08	22.05	**25.5**	**24.5**	**23.5**
	50RB_25	2680.0	24.55	23.56	22.46	**25.5**	**24.5**	**23.5**
		2636.5	24.36	23.38	22.35	**25.5**	**24.5**	**23.5**
		2593.0	24.52	23.58	22.76	**25.5**	**24.5**	**23.5**
		2549.5	24.37	23.45	22.55	**25.5**	**24.5**	**23.5**
		2506.0	24.18	23.24	22.32	**25.5**	**24.5**	**23.5**
	50RB_0	2680.0	24.50	23.52	22.41	**25.5**	**24.5**	**23.5**
		2636.5	24.49	23.52	22.50	**25.5**	**24.5**	**23.5**
		2593.0	24.58	23.63	22.80	**25.5**	**24.5**	**23.5**
		2549.5	24.34	23.41	22.51	**25.5**	**24.5**	**23.5**
		2506.0	24.44	23.51	22.58	**25.5**	**24.5**	**23.5**
	100RB_0	2680.0	24.46	23.47	22.43	**25.5**	**24.5**	**23.5**
		2636.5	24.30	23.32	22.82	**25.5**	**24.5**	**23.5**
		2593.0	24.46	23.50	22.67	**25.5**	**24.5**	**23.5**
		2549.5	24.20	23.26	22.36	**25.5**	**24.5**	**23.5**
		2506.0	24.21	23.25	22.33	**25.5**	**24.5**	**23.5**

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Reduced power level 2/3								
LTE Band 41 PC2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5 MHz	1RB_24	2687.5	22.88	22.94	22.83	23.5	23.5	23.5
		2640.3	22.48	22.86	22.46	23.5	23.5	23.5
		2593.0	22.50	22.77	22.51	23.5	23.5	23.5
		2545.8	22.53	22.70	22.31	23.5	23.5	23.5
		2498.5	22.65	22.79	22.62	23.5	23.5	23.5
	1RB_12	2687.5	22.83	22.69	22.77	23.5	23.5	23.5
		2640.3	22.48	23.13	22.57	23.5	23.5	23.5
		2593.0	22.58	23.30	22.60	23.5	23.5	23.5
		2545.8	22.41	22.84	22.39	23.5	23.5	23.5
		2498.5	22.70	22.74	22.68	23.5	23.5	23.5
	1RB_0	2687.5	22.93	22.94	22.87	23.5	23.5	23.5
		2640.3	22.48	22.82	22.49	23.5	23.5	23.5
		2593.0	22.79	22.95	22.60	23.5	23.5	23.5
		2545.8	22.59	22.90	22.42	23.5	23.5	23.5
		2498.5	22.70	22.87	22.60	23.5	23.5	23.5
	12RB_13	2687.5	22.76	22.91	22.84	23.5	23.5	23.5
		2640.3	22.38	22.51	22.37	23.5	23.5	23.5
		2593.0	22.46	22.46	22.71	23.5	23.5	23.5
		2545.8	22.34	22.45	22.30	23.5	23.5	23.5
		2498.5	22.49	22.44	22.61	23.5	23.5	23.5
	12RB_6	2687.5	22.99	22.97	22.81	23.5	23.5	23.5
		2640.3	22.52	22.58	22.61	23.5	23.5	23.5
		2593.0	22.55	22.61	22.80	23.5	23.5	23.5
		2545.8	22.37	22.46	22.46	23.5	23.5	23.5
		2498.5	22.58	22.60	22.51	23.5	23.5	23.5
	12RB_0	2687.5	22.79	22.98	23.02	23.5	23.5	23.5
		2640.3	22.53	22.58	22.47	23.5	23.5	23.5
		2593.0	22.58	22.62	22.73	23.5	23.5	23.5
		2545.8	22.37	22.41	22.35	23.5	23.5	23.5
		2498.5	22.45	22.54	22.61	23.5	23.5	23.5
	25RB_0	2687.5	22.95	22.81	22.87	23.5	23.5	23.5
		2640.3	22.53	22.62	22.46	23.5	23.5	23.5
		2593.0	22.59	22.60	22.59	23.5	23.5	23.5
		2545.8	22.43	22.46	22.32	23.5	23.5	23.5
		2498.5	22.52	22.53	22.56	23.5	23.5	23.5

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Reduced power level 2/3								
LTE Band 41 PC2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	2685.0	22.73	22.83	22.94	23.5	23.5	23.5
		2639.0	22.46	22.70	22.27	23.5	23.5	23.5
		2593.0	22.47	22.73	22.45	23.5	23.5	23.5
		2547.0	22.49	22.63	22.20	23.5	23.5	23.5
		2501.0	22.50	22.72	22.50	23.5	23.5	23.5
	1RB_24	2685.0	22.98	22.91	22.97	23.5	23.5	23.5
		2639.0	22.44	22.71	22.44	23.5	23.5	23.5
		2593.0	22.54	22.85	22.50	23.5	23.5	23.5
		2547.0	22.44	22.60	22.29	23.5	23.5	23.5
		2501.0	22.50	22.72	22.48	23.5	23.5	23.5
	1RB_0	2685.0	22.80	22.98	22.91	23.5	23.5	23.5
		2639.0	22.44	22.71	22.27	23.5	23.5	23.5
		2593.0	22.69	22.96	22.74	23.5	23.5	23.5
		2547.0	22.51	22.75	22.29	23.5	23.5	23.5
		2501.0	22.66	22.88	22.70	23.5	23.5	23.5
	25RB_25	2685.0	22.99	22.96	22.91	23.5	23.5	23.5
		2639.0	22.41	22.42	22.50	23.5	23.5	23.5
		2593.0	22.39	22.38	22.45	23.5	23.5	23.5
		2547.0	22.35	22.29	22.42	23.5	23.5	23.5
		2501.0	22.39	22.45	22.60	23.5	23.5	23.5
	25RB_12	2685.0	22.87	22.97	22.81	23.5	23.5	23.5
		2639.0	22.51	22.58	22.54	23.5	23.5	23.5
		2593.0	22.65	22.64	22.67	23.5	23.5	23.5
		2547.0	22.47	22.42	22.50	23.5	23.5	23.5
		2501.0	22.62	22.61	22.78	23.5	23.5	23.5
	25RB_0	2685.0	22.87	22.86	22.82	23.5	23.5	23.5
		2639.0	22.39	22.34	22.46	23.5	23.5	23.5
		2593.0	22.56	22.58	22.49	23.5	23.5	23.5
		2547.0	22.34	22.34	22.36	23.5	23.5	23.5
		2501.0	22.47	22.44	22.64	23.5	23.5	23.5
	50RB_0	2685.0	22.80	22.90	22.68	23.5	23.5	23.5
		2639.0	22.51	22.50	22.32	23.5	23.5	23.5
		2593.0	22.57	22.64	22.65	23.5	23.5	23.5
		2547.0	22.45	22.36	22.45	23.5	23.5	23.5
		2501.0	22.58	22.59	22.43	23.5	23.5	23.5

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Reduced power level 2/3								
LTE Band 41 PC2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	2682.5	22.56	22.54	22.33	23.5	23.5	23.5
		2637.8	22.01	22.13	21.95	23.5	23.5	23.5
		2593.0	22.28	22.30	22.06	23.5	23.5	23.5
		2548.3	22.14	22.08	22.16	23.5	23.5	23.5
		2503.5	22.08	22.12	22.05	23.5	23.5	23.5
	1RB_37	2682.5	22.73	22.77	22.53	23.5	23.5	23.5
		2637.8	22.34	22.44	22.24	23.5	23.5	23.5
		2593.0	22.56	22.65	22.36	23.5	23.5	23.5
		2548.3	22.30	22.41	22.16	23.5	23.5	23.5
		2503.5	22.21	22.44	22.15	23.5	23.5	23.5
	1RB_0	2682.5	22.56	22.65	22.41	23.5	23.5	23.5
		2637.8	22.40	22.60	22.32	23.5	23.5	23.5
		2593.0	22.45	22.56	22.27	23.5	23.5	23.5
		2548.3	22.14	22.28	22.00	23.5	23.5	23.5
		2503.5	22.37	22.59	22.26	23.5	23.5	23.5
	36RB_38	2682.5	22.57	22.45	22.42	23.5	23.5	23.5
		2637.8	22.19	22.08	22.12	23.5	23.5	23.5
		2593.0	22.41	22.26	22.26	23.5	23.5	23.5
		2548.3	22.20	22.09	22.11	23.5	23.5	23.5
		2503.5	22.08	22.14	22.11	23.5	23.5	23.5
	36RB_19	2682.5	22.61	22.52	22.48	23.5	23.5	23.5
		2637.8	22.37	22.26	22.31	23.5	23.5	23.5
		2593.0	22.56	22.41	22.42	23.5	23.5	23.5
		2548.3	22.28	22.18	22.20	23.5	23.5	23.5
		2503.5	22.21	22.24	22.21	23.5	23.5	23.5
	36RB_0	2682.5	22.50	22.41	22.38	23.5	23.5	23.5
		2637.8	22.35	22.28	22.30	23.5	23.5	23.5
		2593.0	22.58	22.42	22.43	23.5	23.5	23.5
		2548.3	22.28	22.19	22.21	23.5	23.5	23.5
		2503.5	22.32	22.34	22.33	23.5	23.5	23.5
	75RB_0	2682.5	22.51	22.49	22.45	23.5	23.5	23.5
		2637.8	22.30	22.23	22.26	23.5	23.5	23.5
		2593.0	22.48	22.35	22.35	23.5	23.5	23.5
		2548.3	22.18	22.11	22.13	23.5	23.5	23.5
		2503.5	22.13	22.20	22.17	23.5	23.5	23.5

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Reduced power level 2/3								
LTE Band 41 PC2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	2680.0	22.18	22.47	22.29	23.5	23.5	23.5
		2636.5	22.09	22.02	22.07	23.5	23.5	23.5
		2593.0	22.10	22.36	22.24	23.5	23.5	23.5
		2549.5	22.08	22.21	22.15	23.5	23.5	23.5
		2506.0	22.04	22.15	22.10	23.5	23.5	23.5
	1RB_50	2680.0	22.43	22.75	22.58	23.5	23.5	23.5
		2636.5	22.15	22.39	22.25	23.5	23.5	23.5
		2593.0	22.49	22.71	22.68	23.5	23.5	23.5
		2549.5	22.21	22.53	22.33	23.5	23.5	23.5
		2506.0	22.00	22.34	22.09	23.5	23.5	23.5
	1RB_0	2680.0	22.15	22.51	22.30	23.5	23.5	23.5
		2636.5	22.38	22.69	22.46	23.5	23.5	23.5
		2593.0	22.44	22.62	22.55	23.5	23.5	23.5
		2549.5	22.06	22.37	22.18	23.5	23.5	23.5
		2506.0	22.19	22.56	22.27	23.5	23.5	23.5
	50RB_50	2680.0	22.36	22.50	22.44	23.5	23.5	23.5
		2636.5	22.05	22.11	22.07	23.5	23.5	23.5
		2593.0	22.32	22.29	22.65	23.5	23.5	23.5
		2549.5	22.07	22.16	22.21	23.5	23.5	23.5
		2506.0	22.18	22.21	22.17	23.5	23.5	23.5
	50RB_25	2680.0	22.37	22.52	22.46	23.5	23.5	23.5
		2636.5	22.19	22.25	22.22	23.5	23.5	23.5
		2593.0	22.48	22.46	22.74	23.5	23.5	23.5
		2549.5	22.29	22.37	22.42	23.5	23.5	23.5
		2506.0	22.07	22.23	22.20	23.5	23.5	23.5
	50RB_0	2680.0	22.33	22.47	22.41	23.5	23.5	23.5
		2636.5	22.32	22.39	22.34	23.5	23.5	23.5
		2593.0	**22.61**	22.50	22.75	23.5	23.5	23.5
		2549.5	22.24	22.32	22.37	23.5	23.5	23.5
		2506.0	22.30	22.46	22.45	23.5	23.5	23.5
	100RB_0	2680.0	22.28	22.41	22.44	23.5	23.5	23.5
		2636.5	22.14	22.18	22.23	23.5	23.5	23.5
		2593.0	22.41	22.36	22.59	23.5	23.5	23.5
		2549.5	22.10	22.15	22.22	23.5	23.5	23.5
		2506.0	22.05	22.20	22.19	23.5	23.5	23.5

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The measurement results of downlink LTE 2CA Conducted Power are as below:

Full Power:

Configure		CA List	PCC							SCC				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Intra-Band	Contiguous	CA_2C	Band 2	20M	1900	19100	QPSK	1	0	Band 2	20M	1960.2	902	23.40	23.47
		CA_66B	Band 66	15M	1717.5	132047	QPSK	1	0	Band 66	5M	2121.8	66554	23.54	23.60
		CA_66C	Band 66	20M	1745	132322	QPSK	1	99	Band 66	20M	2174.8	67084	23.66	23.71
	Non-Contiguous	CA_2A-2A	Band 2	20M	1900	19100	QPSK	1	0	Band 2	5M	1932.5	625	23.42	23.47
		CA_4A-4A	Band 4	20M	1732.5	20175	QPSK	1	99	Band 4	5M	2152.5	2375	23.31	23.34
		CA_66A-66A	Band 66	20M	1745	132322	QPSK	1	99	Band 66	5M	2197.5	67311	23.68	23.71

Reduced power level 2:

Configure		CA List	PCC							SCC				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Intra-Band	Contiguous	CA_2C	Band 2	20M	1900	19100	QPSK	1	0	Band 2	20M	1960.2	902	18.12	18.16
		CA_66B	Band 66	15M	1717.5	132047	QPSK	1	0	Band 66	5M	2121.8	66554	18.75	18.78
		CA_66C	Band 66	20M	1770	132572	QPSK	1	99	Band 66	20M	2170.2	67038	18.91	18.95
	Non-Contiguous	CA_2A-2A	Band 2	20M	1900	19100	QPSK	1	0	Band 2	5M	1932.5	625	18.14	18.16
		CA_4A-4A	Band 4	20M	1745	20300	QPSK	1	99	Band 4	5M	2112.5	1975	18.72	18.77
		CA_66A-66A	Band 66	20M	1770	132572	QPSK	1	99	Band 66	5M	2112.5	66461	18.88	18.95

Reduced power level 3:

Configure		CA List	PCC							SCC				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Intra-Band	Contiguous	CA_2C	Band 2	20M	1900	19100	QPSK	1	0	Band 2	20M	1960.2	902	22.59	22.62
		CA_66B	Band 66	15M	1773	132597	QPSK	1	0	Band 66	5M	2188.2	67218	22.76	22.83
		CA_66C	Band 66	20M	1770	132572	QPSK	1	99	Band 66	20M	2170.2	67038	22.89	22.96
	Non-Contiguous	CA_2A-2A	Band 2	20M	1900	19100	QPSK	1	0	Band 2	5M	1932.5	625	22.56	22.62
		CA_4A-4A	Band 4	20M	1720	20050	QPSK	1	50	Band 4	5M	2152.5	2375	22.87	22.94
		CA_66A-66A	Band 66	20M	1770	132572	QPSK	1	99	Band 66	5M	2112.5	66461	22.92	22.96

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10.4. Bluetooth and WLAN Measurement result

Table 10.5: The conducted Power measurement results for Bluetooth

Bluetooth	Tune up	Averaged Power (dBm)		
Mode		Ch.0 (2402MHz)	Ch.39 (2441MHz)	Ch.78 (2480MHz)
GFSK	**9.5**	8.86	8.96	8.39
EDR2M-4_DQPSK	**9.5**	8.82	8.91	8.46
EDR3M-8DPSK	**9.5**	8.81	8.91	8.47
/	**/**	Ch.0 (2402MHz)	Ch.19 (2440MHz)	Ch.39 (2480MHz)
BLE	**3.5**	1.60	3.13	3.41

Table 10.6: The conducted Power measurement results for WLAN 2.4G

Full Power				
Averaged Power (dBm) Duty Cycle: **100%**				
Mode	**Tune up**	Ch.1 (2412 MHz)	Ch.6 (2437Mhz)	Ch.11 (2462MHz)
802.11b	**19.5**	18.78	18.74	18.89
802.11g	**17.5**	15.79	15.72	15.92
802.11n(20MHz)	**17.0**	15.13	15.04	15.29
/	**/**	Ch.3 (2422 MHz)	Ch.6 (2437Mhz)	Ch.9 (2452MHz)
802.11n(40MHz)	**17.0**	16.10	15.70	15.81
Reduced power level 4/5				
Averaged Power (dBm) Duty Cycle: **100%**				
Mode	**Tune up**	Ch.1 (2412 MHz)	Ch.6 (2437Mhz)	Ch.11 (2462MHz)
802.11b	**17.5**	17.04	16.62	17.09
802.11g	**15.5**	13.77	13.59	13.83
802.11n(20MHz)	**15.0**	13.21	13.10	13.27
/	**/**	Ch.3 (2422 MHz)	Ch.6 (2437Mhz)	Ch.9 (2452MHz)
802.11n(40MHz)	**15.0**	14.09	13.73	13.72

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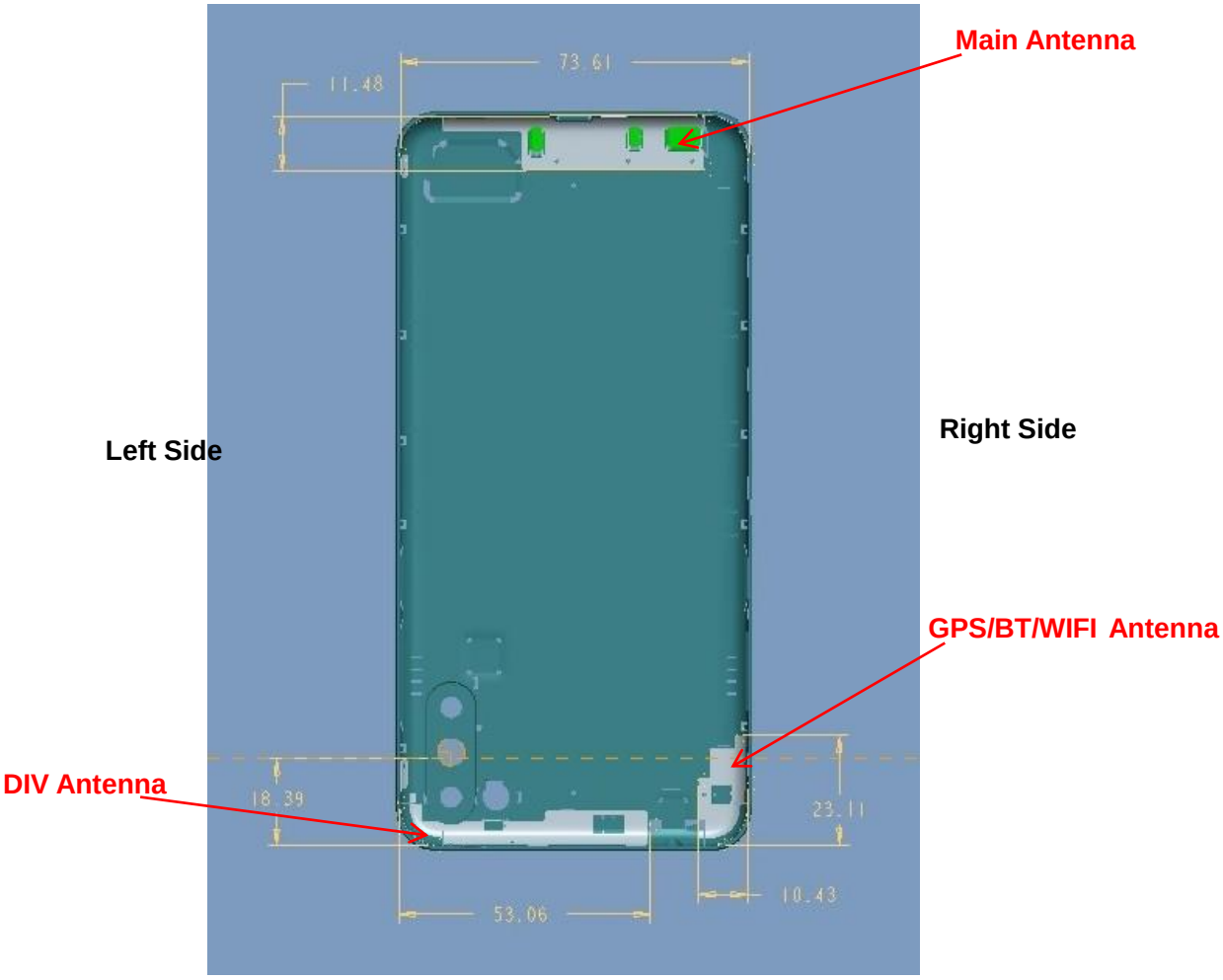
11. Simultaneous TX SAR Considerations

11.1. Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the Bluetooth and WLAN can transmit simultaneous with other transmitters.

11.2. Transmit Antenna Separation Distances

Bottom Side



Top Side

Picture 11.1 Antenna Locations (Back View)

Note:

/	Frequency Bands
Main Antenna	GSM850/1900, WCDMA Band2/4, LTE Band 2/4/13/25/41/66
DIV Antenna	WCDMA Band5, LTE Band5/12/26/71

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11.3. SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR, the edges with less than 25mm distance to the antennas need to be tested for SAR.

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
Main antenna	Yes	Yes	Yes	Yes	No	Yes
DIV antenna	Yes	Yes	Yes	Yes	Yes	No
WLAN antenna	Yes	Yes	Yes	Yes	Yes	No

11.4. Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.
The 1-g SAR test exclusion threshold 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, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Table 11.1: Standalone SAR test exclusion considerations

Band	f(GHz)	Position	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.441	Head	9.60	9.5	8.91	Yes
		Body	19.20	9.5	8.91	Yes
WLAN 2.4G	2.45	Head	9.58	19.5	89.13	No
		Body	19.17	19.5	89.13	No

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12. Evaluation of Simultaneous

Table 12.1: The sum of reported SAR values for WWAN antenna and WLAN

/	Position	WWAN Antenna (W/kg)	WLAN (W/kg)	Sum (W/kg)
Highest reported SAR value for Head	Right Cheek	0.57	0.76	1.33
Highest reported SAR value for Hotspot	Rear	1.08	0.17	1.25
Highest reported SAR value for Body-worn	Rear	0.85	0.19	1.04

Note: the test positions of above tables are for the worse case that has been evaluated.

Table 12.2: The sum of reported SAR values for WWAN antenna and Bluetooth

/	Position	WWAN Antenna (W/kg)	Bluetooth (W/kg)	Sum (W/kg)
Highest reported SAR value for Head	Left Cheek	0.66	0.37	1.03
Highest reported SAR value for Hotspot	Rear	1.08	0.19	1.27
Highest reported SAR value for Body-worn	Rear	0.85	0.12	0.97

Note: the test positions of above tables are for the worse case that has been evaluated.

Table 12.3: Estimated SAR for Bluetooth

Position	f (GHz)	Distance (mm)	Upper limit of power *		Estimated$_{1g}$ (W/kg)
			dBm	mW	
Head	2.441	5	9.5	8.91	0.37
Body	2.441	10	9.5	8.91	0.19
Body	2.441	15	9.5	8.91	0.12

* - Maximum possible output power declared by manufacturer

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:

(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;

Where x = 7.5 for 1-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Conclusion:

According to the above tables, the sum of reported SAR values is < 1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

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13. Summary of Test Results

According to the client's decision rule in the test registration form, which is "based on the measurement results as the basis of the conformity statement", the test conclusion of this report meets the limit requirements.

The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target} - P_{Measured})/10}$$

Where P_{Target} is the power of manufacturing upper limit;

$P_{Measured}$ is the measured power in chapter 10.

Duty Cycle

Mode	**Duty Cycle**
Speech for GSM850/1900	1:8.3
GPRS for GSM850	1:8.3
GPRS for GSM1900	1:2
WCDMA Band2/4/5	1:1
FDD_LTE Band2/4/5/12/13/25/26/66/71	1:1
TDD_LTE Band41 (PC3)	1:1.58
TDD_LTE Band41 (PC2)	1:2.31

13.1. Testing Environment

Temperature:	18°C~25°C
Relative humidity:	30%~70%
Ground system resistance:	<4Ω
Ambient noise & Reflection:	< 0.012 W/kg

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13.2. SAR results

Table 13.1: SAR Values (GSM 850 - Head)

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
836.6	190	Speech	Left Cheek	/	33.53	34.0	0.142	**0.16**	0.02
836.6	190	Speech	Left Tilt	/	33.53	34.0	0.082	**0.09**	0.12
836.6	190	Speech	Right Cheek	**1**	33.53	34.0	**0.194**	**0.22**	0.07
836.6	190	Speech	Right Tilt	/	33.53	34.0	0.102	**0.11**	0.06

Table 13.2: SAR Values (GSM 850 - Body)

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot / Body-Worn Test Data (10mm)									
836.6	190	GPRS	Front	/	33.52	34.0	0.211	**0.24**	-0.03
836.6	190	GPRS	Rear	**2**	33.52	34.0	**0.483**	**0.54**	-0.02
836.6	190	GPRS	Left	/	33.52	34.0	0.076	**0.08**	-0.06
836.6	190	GPRS	Right	/	33.52	34.0	0.156	**0.17**	0.14
836.6	190	GPRS	Bottom	/	33.52	34.0	0.281	**0.31**	0.04

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Table 13.3: SAR Values (GSM 1900 - Head)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
1880	661	Speech	Left Cheek	/	29.83	30.5	0.104	**0.12**	0.16
1880	661	Speech	Left Tilt	/	29.83	30.5	0.083	**0.10**	0.04
1880	661	Speech	Right Cheek	**3**	29.83	30.5	**0.129**	**0.15**	0.02
1880	661	Speech	Right Tilt	/	29.83	30.5	0.056	**0.07**	0.15

Table 13.4: SAR Values (GSM 1900 - Body)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot Test Data (10mm) - Reduced power level 2									
1880	661	GPRS	Front	/	22.14	23.0	0.221	**0.27**	0.03
1880	661	GPRS	Rear	/	22.14	23.0	0.359	**0.44**	0.05
1880	661	GPRS	Left	/	22.14	23.0	0.059	**0.07**	0.01
1880	661	GPRS	Right	/	22.14	23.0	0.073	**0.09**	0.19
1880	661	GPRS	Bottom	**4**	22.14	23.0	**0.562**	**0.69**	-0.14
Body-Worn Test Data (15mm) - Reduced power level 3									
1880	661	GPRS	Front	/	22.14	23.0	0.128	**0.16**	0.02
1880	661	GPRS	Rear	/	22.14	23.0	0.194	**0.24**	0.19

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Table 13.5: SAR Values (WCDMA Band 2 - Head)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
1880	9400	RMC	Left Cheek	/	23.80	25.0	0.227	**0.30**	0.03
1880	9400	RMC	Left Tilt	/	23.80	25.0	0.169	**0.22**	0.03
1880	9400	RMC	Right Cheek	**5**	23.80	25.0	**0.244**	**0.32**	0.06
1880	9400	RMC	Right Tilt	/	23.80	25.0	0.106	**0.14**	0.08

Table 13.6: SAR Values (WCDMA Band 2 - Body)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot Test Data (10mm) - Reduced power level 2									
1880	9400	RMC	Front	/	17.80	19.0	0.187	**0.25**	0.02
1880	9400	RMC	Rear	/	17.80	19.0	0.348	**0.46**	0.05
1880	9400	RMC	Left	/	17.80	19.0	0.049	**0.06**	0.02
1880	9400	RMC	Right	/	17.80	19.0	0.055	**0.07**	0.03
1880	9400	RMC	Bottom	**6**	17.80	19.0	**0.514**	**0.68**	0.02
Body-Worn Test Data (15mm) - Reduced power level 3									
1880	9400	RMC	Front	/	22.20	23.0	0.165	**0.20**	0.00
1880	9400	RMC	Rear	/	22.20	23.0	0.248	**0.30**	0.07

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Table 13.7: SAR Values (WCDMA Band 4 - Head)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
1732.6	1413	RMC	Left Cheek	/	24.10	25.0	0.326	**0.40**	0.04
1732.6	1413	RMC	Left Tilt	/	24.10	25.0	0.212	**0.26**	0.15
1732.6	1413	RMC	Right Cheek	**7**	24.10	25.0	**0.331**	**0.41**	0.04
1732.6	1413	RMC	Right Tilt	/	24.10	25.0	0.211	**0.26**	0.06

Table 13.8: SAR Values (WCDMA Band 4 - Body)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot Test Data (10mm) - Reduced power level 2									
1732.6	1413	RMC	Front	/	17.80	19.0	0.312	**0.41**	0.04
1732.6	1413	RMC	Rear	/	17.80	19.0	0.645	**0.85**	0.06
1732.6	1413	RMC	Left	/	17.80	19.0	0.177	**0.23**	0.06
1732.6	1413	RMC	Right	/	17.80	19.0	0.081	**0.11**	0.09
1732.6	1413	RMC	Bottom	**8**	17.80	19.0	**0.737**	**0.97**	0.18
1752.6	1513	RMC	Rear	/	17.70	19.0	0.558	**0.75**	0.02
1712.4	1312	RMC	Rear	/	17.60	19.0	0.668	**0.92**	0.08
1752.6	1513	RMC	Bottom	/	17.70	19.0	0.714	**0.96**	0.04
1712.4	1312	RMC	Bottom	/	17.60	19.0	0.732	**1.01**	0.02
Body-Worn Test Data (15mm) - Reduced power level 3									
1732.6	1413	RMC	Front	/	21.90	23.0	0.293	**0.38**	0.02
1732.6	1413	RMC	Rear	/	21.90	23.0	0.522	**0.67**	0.11

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Table 13.9: SAR Values (WCDMA Band 5 - Head)

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Reduced power level 1									
836.4	4182	RMC	Left Cheek	**9**	20.50	21.5	**0.516**	**0.65**	-0.14
836.4	4182	RMC	Left Tilt	/	20.50	21.5	0.430	**0.54**	0.09
836.4	4182	RMC	Right Cheek	/	20.50	21.5	0.450	**0.57**	0.02
836.4	4182	RMC	Right Tilt	/	20.50	21.5	0.374	**0.47**	0.05

Table 13.10: SAR Values (WCDMA Band 5 - Body)

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot / Body-Worn Test Data (10mm)									
836.4	4182	RMC	Front	/	25.10	25.5	0.391	**0.43**	0.01
836.4	4182	RMC	Rear	**10**	25.10	25.5	**0.571**	**0.63**	0.03
836.4	4182	RMC	Left	/	25.10	25.5	0.249	**0.27**	0.06
836.4	4182	RMC	Right	/	25.10	25.5	0.386	**0.42**	0.12
836.4	4182	RMC	Bottom	/	25.10	25.5	0.410	**0.45**	0.12

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Table 13.11: SAR Values (LTE Band 12 - Head)

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Reduced power level 1									
707.5	23095	1RB_0	Left Cheek	**11**	20.98	22.0	**0.523**	**0.66**	-0.05
707.5	23095	25RB_25	Left Cheek	/	20.69	22.0	0.475	**0.64**	0.03
707.5	23095	1RB_0	Left Tilt	/	20.98	22.0	0.318	**0.40**	0.07
707.5	23095	25RB_25	Left Tilt	/	20.69	22.0	0.316	**0.43**	-0.13
707.5	23095	1RB_0	Right Cheek	/	20.98	22.0	0.357	**0.45**	0.03
707.5	23095	25RB_25	Right Cheek	/	20.69	22.0	0.352	**0.48**	-0.01
707.5	23095	1RB_0	Right Tilt	/	20.98	22.0	0.218	**0.28**	0.07
707.5	23095	25RB_25	Right Tilt	/	20.69	22.0	0.219	**0.30**	0.04

Table 13.12: SAR Values (LTE Band 12 - Body)

Ambient Temperature: 22.8°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot / Body-Worn Test Data (10mm)									
707.5	23095	1RB_0	Front	/	24.27	25.0	0.122	**0.14**	0.09
707.5	23095	25RB_0	Front	/	22.82	24.0	0.098	**0.13**	0.06
707.5	23095	1RB_0	Rear	**12**	24.27	25.0	**0.283**	**0.33**	0.03
707.5	23095	25RB_0	Rear	/	22.82	24.0	0.237	**0.31**	0.04
707.5	23095	1RB_0	Left	/	24.27	25.0	0.080	**0.09**	-0.04
707.5	23095	25RB_0	Left	/	22.82	24.0	0.064	**0.08**	-0.07
707.5	23095	1RB_0	Right	/	24.27	25.0	0.158	**0.19**	0.14
707.5	23095	25RB_0	Right	/	22.82	24.0	0.124	**0.16**	-0.15
707.5	23095	1RB_0	Top	/	24.27	25.0	0.182	**0.22**	0.17
707.5	23095	25RB_0	Top	/	22.82	24.0	0.143	**0.19**	0.15

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Table 13.13: SAR Values (LTE Band 13 - Head)

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
782	23230	1RB_0	Left Cheek	/	24.12	25.0	0.246	**0.30**	0.06
782	23230	25RB_0	Left Cheek	/	22.73	24.0	0.185	**0.25**	0.02
782	23230	1RB_0	Left Tilt	/	24.12	25.0	0.158	**0.19**	0.13
782	23230	25RB_0	Left Tilt	/	22.73	24.0	0.127	**0.17**	0.12
782	23230	1RB_0	Right Cheek	**13**	24.12	25.0	**0.352**	**0.43**	0.03
782	23230	25RB_0	Right Cheek	/	22.73	24.0	0.265	**0.36**	0.05
782	23230	1RB_0	Right Tilt	/	24.12	25.0	0.198	**0.24**	0.00
782	23230	25RB_0	Right Tilt	/	22.73	24.0	0.159	**0.21**	0.07

Table 13.14: SAR Values (LTE Band 13 - Body)

Ambient Temperature: 22.8°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot / Body-Worn Test Data (10mm)									
782	23230	1RB_0	Front	/	24.12	25.0	0.277	**0.34**	0.01
782	23230	25RB_0	Front	/	22.73	24.0	0.218	**0.29**	0.05
782	23230	1RB_0	Rear	**14**	24.12	25.0	**0.390**	**0.48**	-0.08
782	23230	25RB_0	Rear	/	22.73	24.0	0.295	**0.40**	-0.06
782	23230	1RB_0	Left	/	24.12	25.0	0.301	**0.37**	0.18
782	23230	25RB_0	Left	/	22.73	24.0	0.239	**0.32**	0.09
782	23230	1RB_0	Right	/	24.12	25.0	0.352	**0.43**	0.00
782	23230	25RB_0	Right	/	22.73	24.0	0.280	**0.38**	0.12
782	23230	1RB_0	Bottom	/	24.12	25.0	0.201	**0.25**	0.19
782	23230	25RB_0	Bottom	/	22.73	24.0	0.162	**0.22**	0.19

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Table 13.15: SAR Values (LTE Band 25 - Head)

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
1905	26590	1RB_0	Left Cheek	/	23.90	24.5	0.302	**0.35**	0.04
1905	26590	25RB_0	Left Cheek	/	22.69	23.5	0.244	**0.29**	0.06
1905	26590	1RB_49	Left Tilt	/	23.90	24.5	0.229	**0.26**	0.16
1905	26590	25RB_0	Left Tilt	/	22.69	23.5	0.183	**0.22**	0.10
1905	26590	1RB_49	Right Cheek	**15**	23.90	24.5	**0.332**	**0.38**	0.07
1905	26590	25RB_0	Right Cheek	/	22.69	23.5	0.261	**0.31**	0.03
1905	26590	1RB_49	Right Tilt	/	23.90	24.5	0.124	**0.14**	0.11
1905	26590	25RB_0	Right Tilt	/	22.69	23.5	0.096	**0.12**	0.03

Table 13.16: SAR Values (LTE Band 25 - Body)

Ambient Temperature: 22.8°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot Test Data (10mm) - Reduced power level 2									
1905	26590	1RB_0	Front	/	18.25	19.0	0.219	**0.26**	0.03
1905	26590	25RB_25	Front	/	18.10	19.0	0.217	**0.27**	0.13
1905	26590	1RB_0	Rear	/	18.25	19.0	0.435	**0.52**	0.10
1905	26590	25RB_25	Rear	/	18.10	19.0	0.394	**0.48**	0.12
1905	26590	1RB_0	Left	/	18.25	19.0	0.081	**0.10**	0.15
1905	26590	25RB_25	Left	/	18.10	19.0	0.087	**0.11**	0.11
1905	26590	1RB_0	Right	/	18.25	19.0	0.071	**0.08**	0.01
1905	26590	25RB_25	Right	/	18.10	19.0	0.067	**0.08**	0.10
1905	26590	1RB_0	Bottom	/	18.25	19.0	0.687	**0.82**	0.03
1905	26590	25RB_25	Bottom	/	18.10	19.0	0.599	**0.74**	0.06
1905	26590	1RB_0	Bottom	/	18.17	19.0	0.701	**0.85**	0.03
1882.5	26365	1RB_0	Bottom	**16**	18.16	19.0	**0.800**	**0.97**	0.09
1860	26140	1RB_0	Bottom	/	18.19	19.0	0.562	**0.68**	0.02
1905	26590	100RB	Bottom	/	18.25	19.0	0.219	**0.26**	0.03
Body-Worn Test Data (15mm) - Reduced power level 3									
1905	26590	1RB_0	Front	/	22.53	23.0	0.228	**0.25**	0.04
1905	26590	25RB_0	Front	/	22.44	23.0	0.212	**0.24**	0.02
1905	26590	1RB_0	Rear	/	22.53	23.0	0.342	**0.38**	0.03
1905	26590	25RB_0	Rear	/	22.44	23.0	0.315	**0.36**	0.09

Note: SAR for LTE Band 2 is covered by LTE Band 25 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

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Table 13.17: SAR Values (LTE Band 26 - Head)

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Reduced power level 1									
822.5	26775	1RB_74	Left Cheek	**17**	20.22	21.0	**0.543**	**0.65**	0.03
822.5	26775	36RB_0	Left Cheek	/	20.03	21.0	0.522	**0.65**	0.02
822.5	26775	1RB_74	Left Tilt	/	20.22	21.0	0.389	**0.47**	0.12
822.5	26775	36RB_0	Left Tilt	/	20.03	21.0	0.343	**0.43**	0.07
822.5	26775	1RB_74	Right Cheek	/	20.22	21.0	0.439	**0.53**	0.01
822.5	26775	36RB_0	Right Cheek	/	20.03	21.0	0.414	**0.52**	-0.05
822.5	26775	1RB_74	Right Tilt	/	20.22	21.0	0.311	**0.37**	-0.06
822.5	26775	36RB_0	Right Tilt	/	20.03	21.0	0.275	**0.34**	-0.03

Table 13.18: SAR Values (LTE Band 26- Body)

Ambient Temperature: 22.8°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot / Body-Worn Test Data (10mm)									
822.5	26775	1RB_74	Front	/	24.45	25.0	0.308	**0.35**	0.04
822.5	26775	36RB_0	Front	/	23.16	24.0	0.232	**0.28**	0.02
822.5	26775	1RB_74	Rear	**18**	24.45	25.0	**0.488**	**0.55**	0.05
822.5	26775	36RB_0	Rear	/	23.16	24.0	0.353	**0.43**	0.03
822.5	26775	1RB_74	Left	/	24.45	25.0	0.233	**0.26**	0.02
822.5	26775	36RB_0	Left	/	23.16	24.0	0.180	**0.22**	0.12
822.5	26775	1RB_74	Right	/	24.45	25.0	0.422	**0.48**	0.03
822.5	26775	36RB_0	Right	/	23.16	24.0	0.296	**0.36**	0.05
822.5	26775	1RB_74	Top	/	24.45	25.0	0.344	**0.39**	0.06
822.5	26775	36RB_0	Top	/	23.16	24.0	0.224	**0.27**	0.03

Note: SAR for LTE Band 5 is covered by LTE Band 26 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

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Table 13.19: SAR Values (LTE Band 41 - Head)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
2680	41490	1RB_50	Left Cheek	/	23.62	24.5	0.054	**0.07**	0.08
2593	40620	50RB_0	Left Cheek	/	22.63	23.5	0.049	**0.06**	0.05
2680	41490	1RB_50	Left Tilt	/	23.62	24.5	0.031	**0.04**	0.09
2593	40620	50RB_0	Left Tilt	/	22.63	23.5	0.048	**0.06**	0.03
2680	41490	1RB_50	Right Cheek	/	23.62	24.5	0.106	**0.13**	0.02
2593	40620	50RB_0	Right Cheek	/	22.63	23.5	0.105	**0.13**	0.08
2680	41490	1RB_50	Right Tilt	/	23.62	24.5	0.049	**0.06**	0.07
2593	40620	50RB_0	Right Tilt	/	22.63	23.5	0.077	**0.09**	0.06
The worst case with PC2									
2680	41490	1RB_50	Right Cheek	**19**	25.61	26.5	**0.122**	**0.15**	0.09

Note: Per **TCB workshop May 2017** Guidance, all SAR tests were performed using power class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see **ANNEX K** for linearity results.

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Table 13.20: SAR Values (LTE Band 41 - Body)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot Test Data (10mm) - Reduced power level 2									
2680	41490	1RB_50	Front	/	22.00	23.0	0.341	**0.43**	0.02
2593	40620	50RB_0	Front	/	22.04	23.0	0.390	**0.49**	0.08
2680	41490	1RB_50	Rear	/	22.00	23.0	0.782	**0.98**	0.12
2593	40620	50RB_0	Rear	**20**	22.04	23.0	**0.865**	**1.08**	0.02
2680	41490	1RB_50	Left	/	22.00	23.0	0.094	**0.12**	0.02
2593	40620	50RB_0	Left	/	22.04	23.0	0.119	**0.15**	0.03
2680	41490	1RB_50	Right	/	22.00	23.0	0.117	**0.15**	0.02
2593	40620	50RB_0	Right	/	22.04	23.0	0.134	**0.17**	0.09
2680	41490	1RB_50	Bottom	/	22.00	23.0	0.745	**0.94**	-0.07
2593	40620	50RB_0	Bottom	/	22.04	23.0	0.738	**0.92**	-0.06
2636.5	41055	1RB_50	Rear	/	21.91	23.0	0.759	**0.98**	0.09
2593	40620	1RB_50	Rear	/	21.96	23.0	0.749	**0.95**	0.03
2549	40185	1RB_50	Rear	/	21.65	23.0	0.721	**0.98**	0.02
2593	39750	1RB_50	Rear	/	21.76	23.0	0.550	**0.73**	0.04
2680	41490	50RB_0	Rear	/	21.83	23.0	0.663	**0.87**	-0.10
2636.5	41055	50RB_0	Rear	/	21.89	23.0	0.699	**0.90**	0.07
2549	40185	50RB_0	Rear	/	21.77	23.0	0.687	**0.91**	0.02
2593	39750	50RB_0	Rear	/	21.81	23.0	0.611	**0.80**	0.01
2593	40620	100RB	Rear	/	21.93	23.0	0.735	**0.94**	0.11
2636.5	41055	1RB_50	Bottom	/	21.91	23.0	0.647	**0.83**	-0.08
2593	40620	1RB_50	Bottom	/	21.96	23.0	0.630	**0.80**	-0.14
2549	40185	1RB_50	Bottom	/	21.65	23.0	0.593	**0.81**	-0.15
2593	39750	1RB_50	Bottom	/	21.76	23.0	0.398	**0.53**	-0.04
2680	41490	50RB_0	Bottom	/	21.83	23.0	0.656	**0.86**	-0.07
2636.5	41055	50RB_0	Bottom	/	21.89	23.0	0.664	**0.86**	-0.17
2549	40185	50RB_0	Bottom	/	21.77	23.0	0.561	**0.74**	-0.02
2593	39750	50RB_0	Bottom	/	21.81	23.0	0.443	**0.58**	-0.08
2593	40620	100RB	Bottom	/	21.93	23.0	0.636	**0.81**	-0.02
The worst case with PC2 - Reduced power level 2									
2593	40620	50RB_0	Rear	/	22.61	23.5	0.742	**0.91**	0.09
Body-Worn Test Data (15mm) - Reduced power level 3									
2680	41490	1RB_50	Front	/	22.00	23.0	0.173	**0.22**	0.03
2593	40620	50RB_0	Front	/	22.04	23.0	0.194	**0.24**	0.01
2680	41490	1RB_50	Rear	/	22.00	23.0	0.362	**0.46**	0.14
2593	40620	50RB_0	Rear	/	22.04	23.0	**0.426**	**0.53**	0.02
The worst case with PC2 - Reduced power level 3									
2593	40620	50RB_0	Rear	/	22.61	23.5	0.342	**0.42**	-0.03

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Note: Per **TCB workshop May 2017** Guidance, all SAR tests were performed using power class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see **ANNEX K** for linearity results.

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Table 13.21: SAR Values (LTE Band 66 - Head)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
1745	132322	1RB_99	Left Cheek	**21**	23.71	24.5	**0.454**	**0.54**	0.09
1770	132572	50RB_50	Left Cheek	/	22.53	23.5	0.362	**0.45**	0.16
1745	132322	1RB_99	Left Tilt	/	23.71	24.5	0.309	**0.37**	0.06
1770	132572	50RB_50	Left Tilt	/	22.53	23.5	0.225	**0.28**	0.13
1745	132322	1RB_99	Right Cheek	/	23.71	24.5	0.339	**0.41**	0.16
1770	132572	50RB_50	Right Cheek	/	22.53	23.5	0.221	**0.28**	0.06
1745	132322	1RB_99	Right Tilt	/	23.71	24.5	0.263	**0.32**	0.02
1770	132572	50RB_50	Right Tilt	/	22.53	23.5	0.190	**0.24**	0.12

Table 13.22: SAR Values (LTE Band 66 - Body)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot Test Data (10mm) - Reduced power level 2									
1720	132072	1RB_99	Front	/	18.95	19.5	0.293	**0.33**	0.02
1770	132572	50RB_50	Front	/	18.63	19.5	0.269	**0.33**	0.02
1720	132072	1RB_99	Rear	/	18.95	19.5	0.496	**0.56**	0.13
1770	132572	50RB_50	Rear	/	18.63	19.5	0.440	**0.54**	0.18
1720	132072	1RB_99	Left	/	18.95	19.5	0.150	**0.17**	0.09
1770	132572	50RB_50	Left	/	18.63	19.5	0.141	**0.17**	0.08
1720	132072	1RB_99	Right	/	18.95	19.5	0.058	**0.07**	0.15
1770	132572	50RB_50	Right	/	18.63	19.5	0.053	**0.06**	-0.12
1720	132072	1RB_99	Bottom	/	18.95	19.5	0.697	**0.79**	0.04
1770	132572	50RB_50	Bottom	/	18.63	19.5	0.634	**0.77**	0.16
Body-Worn Test Data (15mm) - Reduced power level 3									
1720	132072	1RB_99	Front	/	22.96	23.5	0.481	**0.54**	0.19
1720	132072	50RB_50	Front	/	22.77	23.5	0.438	**0.52**	0.15
1720	132072	1RB_99	Rear	**22**	22.96	23.5	**0.749**	**0.85**	0.12
1720	132072	50RB_50	Rear	/	22.77	23.5	0.676	**0.80**	0.11
1770	132572	1RB_99	Rear	/	22.80	23.5	0.710	**0.83**	0.00
1745	132322	1RB_99	Rear	/	22.87	23.5	0.697	**0.81**	0.04
1770	132572	50RB_50	Rear	/	22.70	23.5	0.640	**0.77**	0.04
1745	132322	50RB_50	Rear	/	22.75	23.5	0.621	**0.74**	0.01
1770	132572	100RB	Rear	/	22.77	23.5	0.644	**0.76**	0.05

Note: SAR for LTE Band 4 is covered by LTE Band 66 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

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Table 13.23: SAR Values (LTE Band 71 - Head)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Reduced power level 1									
688	133372	1RB_0	Left Cheek	/	21.53	22.5	0.420	**0.53**	-0.15
688	133372	50RB_0	Left Cheek	**23**	21.75	22.5	**0.548**	**0.65**	0.09
688	133372	1RB_0	Left Tilt	/	21.53	22.5	0.357	**0.45**	-0.08
688	133372	50RB_0	Left Tilt	/	21.75	22.5	0.440	**0.52**	-0.07
688	133372	1RB_0	Right Cheek	/	21.53	22.5	0.200	**0.25**	-0.02
688	133372	50RB_0	Right Cheek	/	21.75	22.5	0.251	**0.30**	-0.05
688	133372	1RB_0	Right Tilt	/	21.53	22.5	0.169	**0.21**	-0.03
688	133372	50RB_0	Right Tilt	/	21.75	22.5	0.191	**0.23**	0.09

Table 13.24: SAR Values (LTE Band 71 - Body)

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Hotspot / Body-Worn Test Data (10mm)									
1720	132072	1RB_0	Front	/	23.71	24.5	0.222	**0.27**	0.03
1770	132572	50RB_0	Front	/	22.91	23.5	0.202	**0.23**	0.04
1720	132072	1RB_0	Rear	**24**	23.71	24.5	**0.354**	**0.42**	-0.08
1770	132572	50RB_0	Rear	/	22.91	23.5	0.326	**0.37**	0.08
1720	132072	1RB_0	Left	/	23.71	24.5	0.236	**0.28**	0.03
1770	132572	50RB_0	Left	/	22.91	23.5	0.216	**0.25**	0.01
1720	132072	1RB_0	Right	/	23.71	24.5	0.414	**0.50**	0.06
1770	132572	50RB_0	Right	/	22.91	23.5	0.360	**0.41**	0.02
1720	132072	1RB_0	Top	/	23.71	24.5	0.175	**0.21**	0.17
1770	132572	50RB_0	Top	/	22.91	23.5	0.157	**0.18**	0.04

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13.3. WLAN Evaluation for 2.4G

According to the KDB248227 D01, SAR is measured for 2.4GHz 802.11b DSSS using the initial test position procedure.

Table 13.25: SAR Values (WLAN 2.4G - Head)

Ambient Temperature: 22.4°C Liquid Temperature: 21.8°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Reduced power level 4									
2462	11	802.11b	Left Cheek	/	17.09	17.5	0.271	**0.30**	0.02
2462	11	802.11b	Left Tilt	/	17.09	17.5	0.246	**0.27**	0.12
2462	11	802.11b	Right Cheek	**25**	17.09	17.5	**0.693**	**0.76**	0.06
2462	11	802.11b	Right Tilt	/	17.09	17.5	0.436	**0.48**	0.06

Note1: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

Table 13.26: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2462	11	Right Cheek	100%	100%	0.76	**0.76**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.

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Table 13.27: SAR Values (WLAN 2.4G - Body)

Ambient Temperature: 22.4°C Liquid Temperature: 21.8°C									
Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Test Data (10mm)									
2462	11	802.11b	Front	/	18.89	19.5	0.280	**0.32**	0.04
2462	11	802.11b	Rear	**26**	18.89	19.5	**0.373**	**0.43**	0.05
2462	11	802.11b	Left	/	18.89	19.5	0.397	**0.46**	0.12
2462	11	802.11b	Right	/	18.89	19.5	0.057	**0.07**	0.08
2462	11	802.11b	Top	B2	18.89	19.5	0.322	**0.37**	0.01
Test Data (10mm) - Reduced power level 5									
2462	11	802.11b	Front	/	17.09	17.5	0.115	**0.13**	0.04
2462	11	802.11b	Rear	/	17.09	17.5	0.153	**0.17**	0.01
2462	11	802.11b	Left	/	17.09	17.5	**0.163**	**0.18**	0.12
2462	11	802.11b	Right	/	17.09	17.5	0.024	**0.03**	0.08
2462	11	802.11b	Top	/	17.09	17.5	0.132	**0.15**	0.01
Test Data (15mm)									
2462	11	802.11b	Front	/	18.89	19.5	0.129	**0.15**	0.13
2462	11	802.11b	Rear	/	18.89	19.5	**0.169**	**0.19**	0.06

Note1: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

Table 13.28: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C						
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2462	11	Rear	100%	100%	0.43	**0.43**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.

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14. SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) 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).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Table 14.1: SAR Measurement Variability for Body – LTE Band 25

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
MHz	Ch.		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
1860	26140	Bottom	0.800	0.788	1.02	/

Table 14.2: SAR Measurement Variability for Body – LTE Band 41

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
MHz	Ch.		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
2593	40620	Bottom	0.865	0.849	1.02	/

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15. Measurement Uncertainty

15.1. Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	12	N	2	1	1	6.0	6.0	∞
2	Axial isotropy	B	4.7	R	$\sqrt{3}$	√0.5	√0.5	4.3	4.3	∞
3	Hemispherical isotropy	B	9.6	R	$\sqrt{3}$	1	1	4.8	4.8	∞
4	Boundary effect	B	1.1	R	$\sqrt{3}$	1	1	0.6	0.6	∞
5	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
6	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	Modulation response	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
8	Readout electronics	B	1.0	N	1	1	1	1.0	1.0	∞
9	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
10	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
11	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioned mech. restrictions	B	0.35	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
17	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
18	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
19	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
20	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	9
22	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
23	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	0.96	0.78	9
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{23} c_i^2 u_i^2}$						11.3	11.2	95.5
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						22.6	22.4	

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16. Main Test Instruments

Table 16.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46103759	2020-11-15	One year
02	Dielectric probe	85070E	MY44300317	/	/
03	Power meter	E4418B	MY50000366	2020-12-13	One year
04	Power sensor	E9304A	MY50000188		
05	Power meter	NRP	101460	2020-01-15	One year
06	Power sensor	NRP-Z91	100553		
07	Signal Generator	E8257D	MY47461211	2020-01-15	One year
08	Amplifier	VTL5400	0404	/	/
09	E-field Probe	ES3DV3	3151	2020-01-03	One year
10	DAE	DAE4	786	2020-03-03	One year
11	Dipole Validation Kit	D750V3	1163	2019-09-03	Three year
12	Dipole Validation Kit	D835V2	4d057	2018-10-09	Three year
13	Dipole Validation Kit	D1750V2	1152	2019-08-30	Three year
14	Dipole Validation Kit	D1900V2	5d088	2018-10-24	Three year
15	Dipole Validation Kit	D2450V2	873	2018-10-26	Three year
16	Dipole Validation Kit	D2550V2	1058	2018-08-24	Three year
17	BTS	E5515C	GB46110722	2020-01-05	One year
18	Radio Communication Analyzer	MT8820C	6201341853	2020-01-15	One year
19	Software	DASY5	52.8.8.1222	/	/

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ANNEX A: Graph Results

GSM850 Head

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.919 S/m; ε_r = 40.667; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, GSM (0) Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Right Cheek Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.195 W/kg

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

Reference Value = 2.718 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.252 W/kg

SAR(1 g) = 0.194 W/kg; SAR(10 g) = 0.146 W/kg

Maximum value of SAR (measured) = 0.212 W/kg

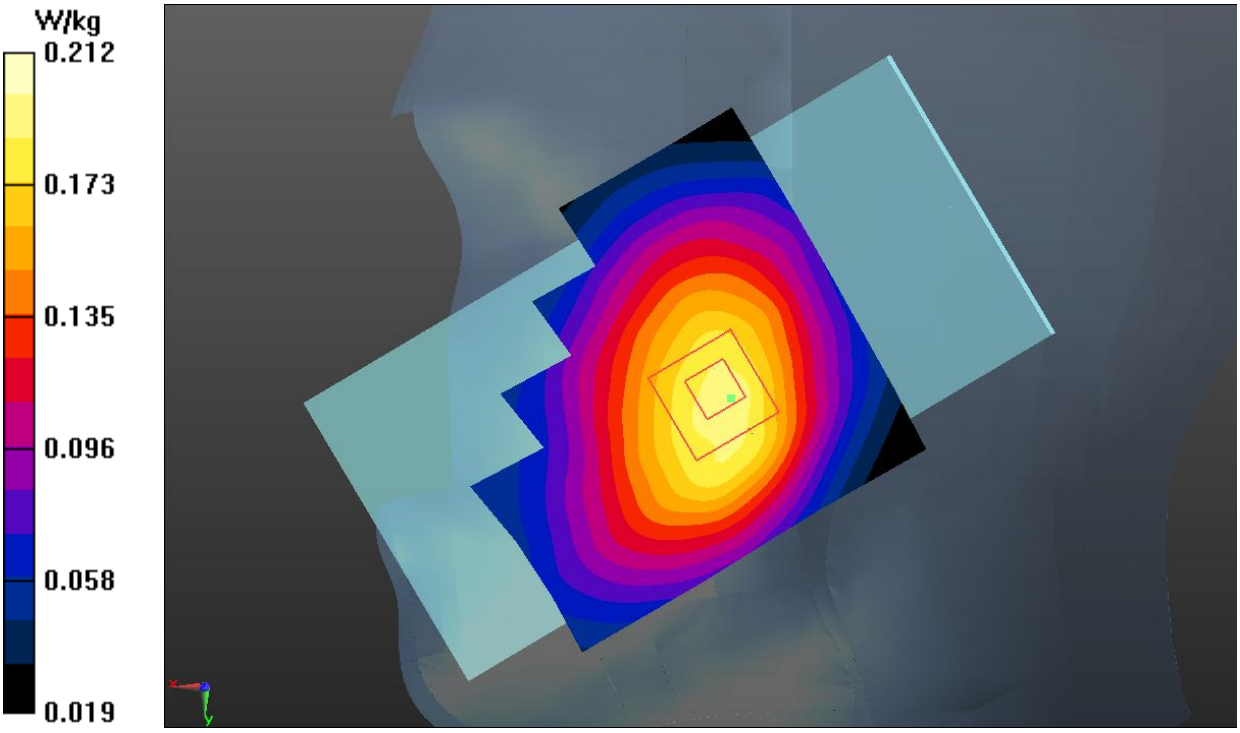

Fig.1 GSM 850 Head

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GSM850 Body

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.919 S/m; ε_r = 40.667; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, GPRS 1Txslot (0) Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Rear Side Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.568 W/kg

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

Reference Value = 13.52 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.944 W/kg

SAR(1 g) = 0.483 W/kg; SAR(10 g) = 0.257 W/kg

Maximum value of SAR (measured) = 0.587 W/kg

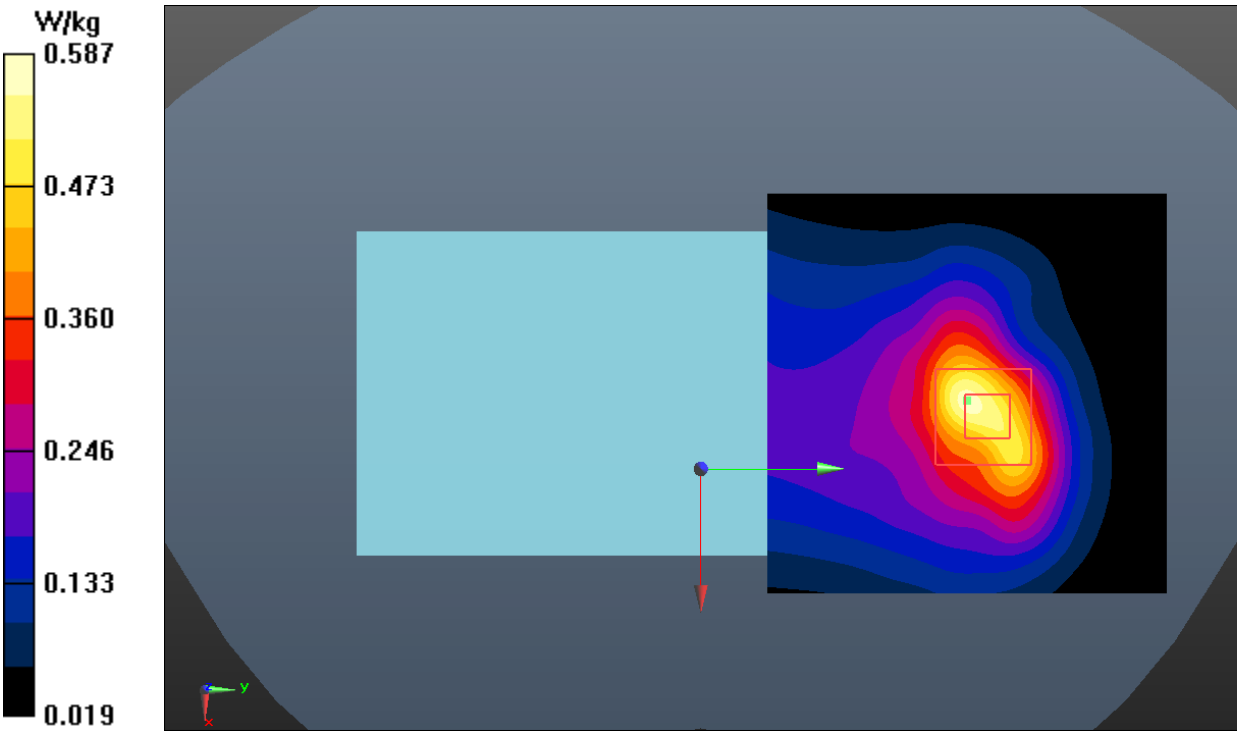

Fig.2 GSM 850 Body

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GSM1900 Head

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1880 MHz; σ = 1.401 S/m; ε_r = 38.93; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, GSM (0) Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

Right Cheek Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.151 W/kg

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

Reference Value = 4.192 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.129 W/kg; SAR(10 g) = 0.081 W/kg

Maximum value of SAR (measured) = 0.152 W/kg

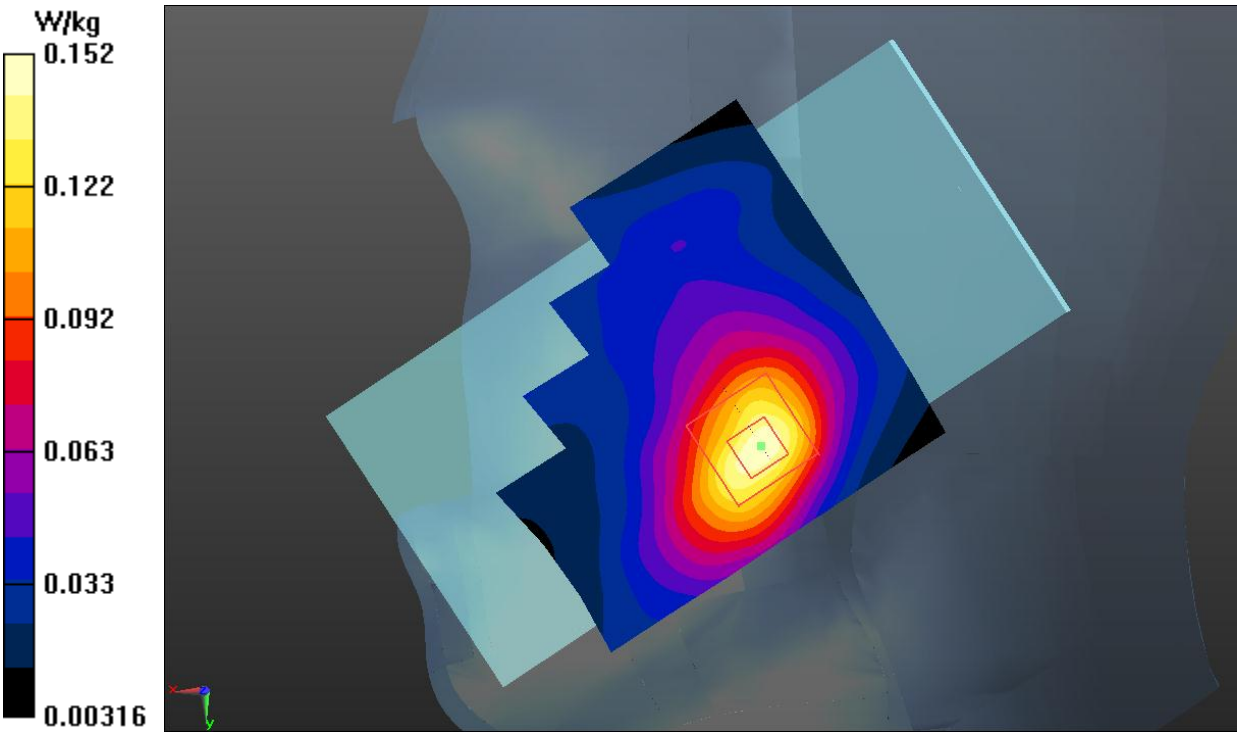

Fig.3 GSM 1900 Head

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GSM1900 Body

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1880 MHz; σ = 1.401 S/m; ε_r = 38.93; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, GPRS 4Txslot (0) Frequency: 1880 MHz Duty Cycle: 1:2

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

Bottom Side Middle/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.718 W/kg

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

Reference Value = 21.20 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.562 W/kg; SAR(10 g) = 0.291 W/kg

Maximum value of SAR (measured) = 0.701 W/kg

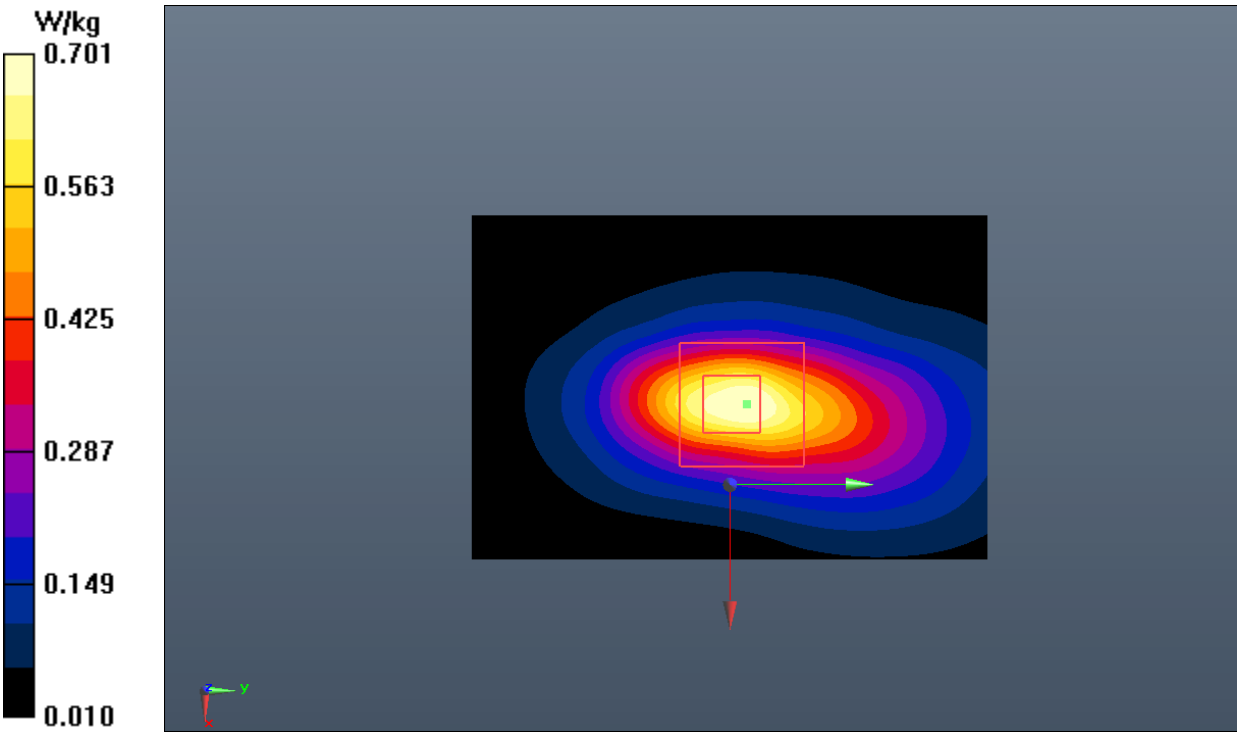

Fig.4 GSM 1900 Body

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WCDMA Band 2 Head

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1880 MHz; σ = 1.401 S/m; ε_r = 38.93; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

Right Cheek Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.310 W/kg

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

Reference Value = 5.459 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.361 W/kg

SAR(1 g) = 0.244 W/kg; SAR(10 g) = 0.154 W/kg

Maximum value of SAR (measured) = 0.281 W/kg

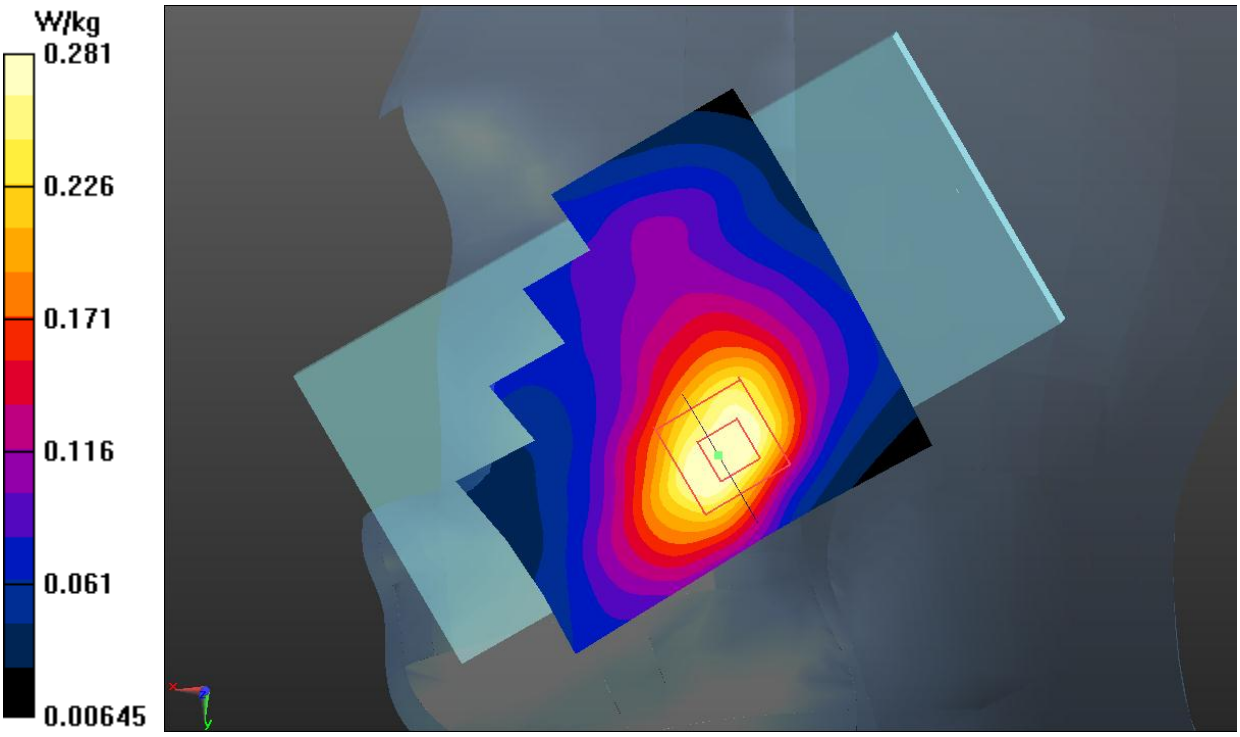

Fig.5 WCDMA Band 2 Head

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WCDMA Band 2 Body

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1880 MHz; σ = 1.401 S/m; ε_r = 38.93; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

Bottom Side Middle/Area Scan (51x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.761 W/kg

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

Reference Value = 5.755 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.514 W/kg; SAR(10 g) = 0.245 W/kg

Maximum value of SAR (measured) = 0.774 W/kg

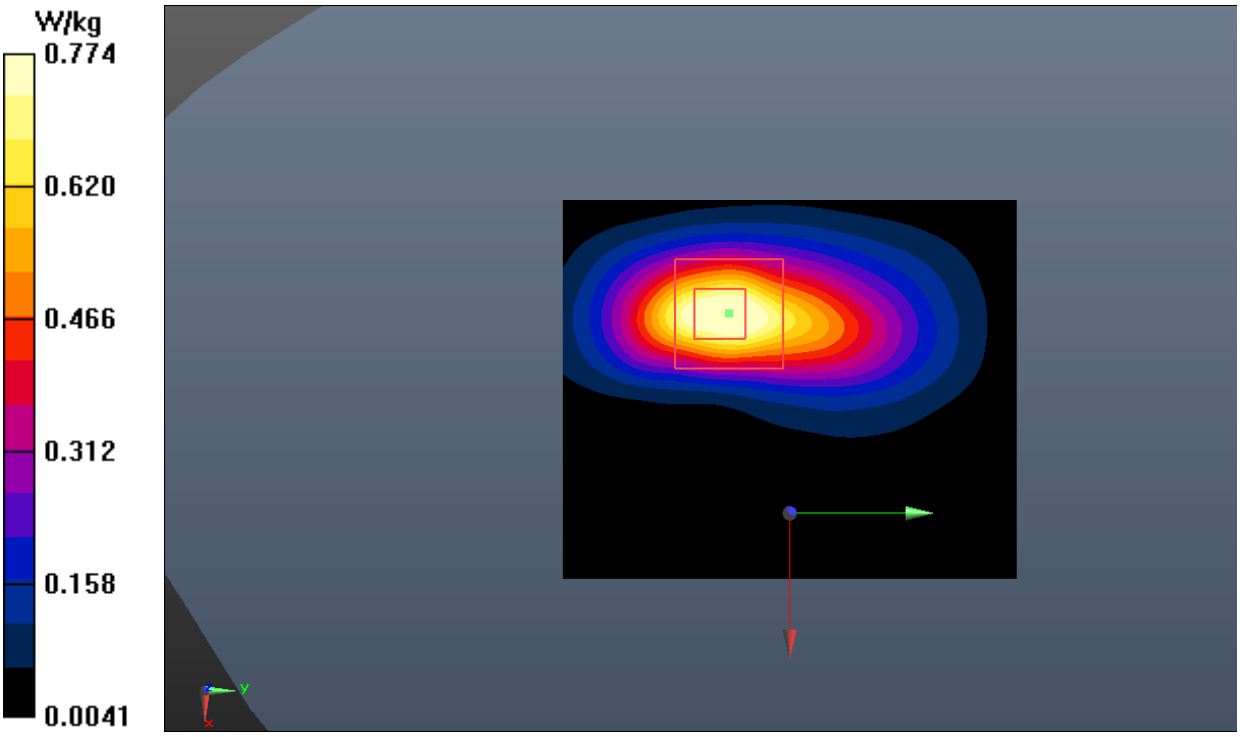

Fig.6 WCDMA Band 2 Body

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WCDMA Band 4 Head

Date: 2020-12-15

Electronics: DAE4 Sn786

Medium: Head 1750MHz

Medium parameters used: f = 1733 MHz; σ = 1.37 S/m; ε_r = 39.489; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.23, 5.23, 5.23);

Right Cheek Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.410 W/kg

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

Reference Value = 7.849 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.475 W/kg

SAR(1 g) = 0.331 W/kg; SAR(10 g) = 0.217 W/kg

Maximum value of SAR (measured) = 0.408 W/kg

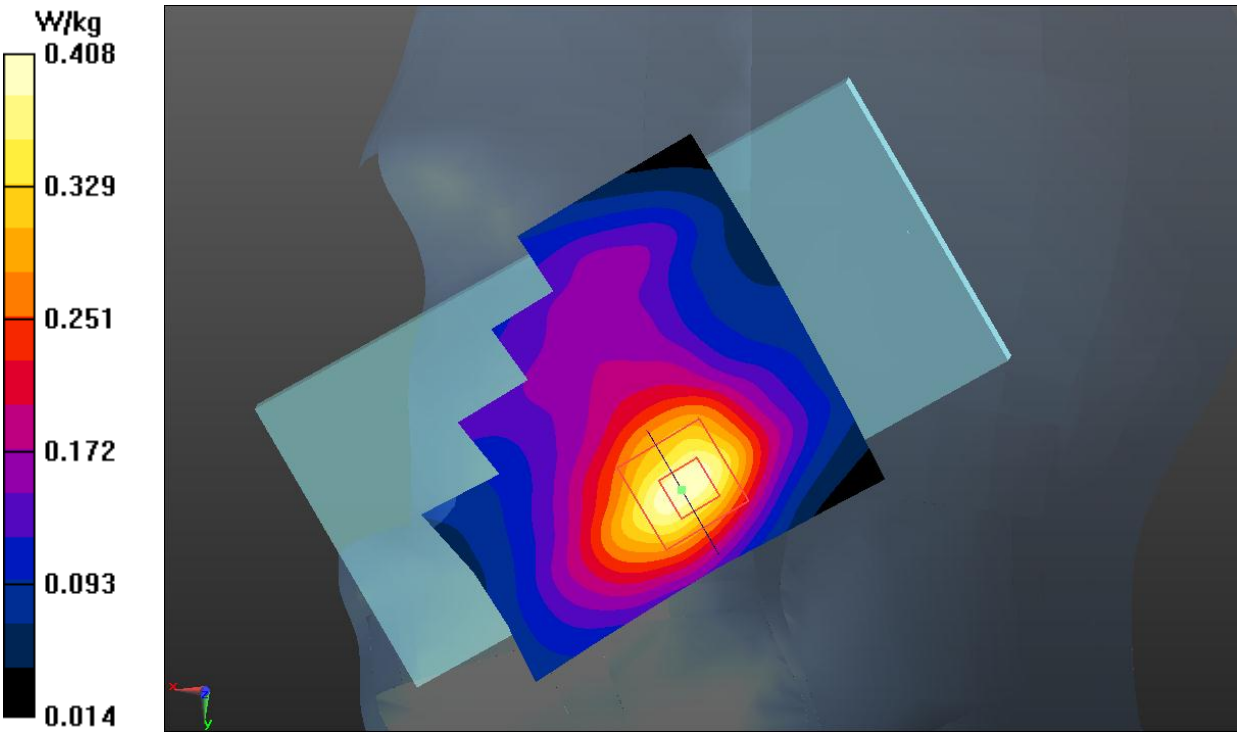

Fig.7 WCDMA Band 4 Head

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WCDMA Band 4 Body

Date: 2020-12-15

Electronics: DAE4 Sn786

Medium: Head 1750MHz

Medium parameters used: f = 1733 MHz; σ = 1.37 S/m; ε_r = 39.489; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.23, 5.23, 5.23);

Bottom Side Middle/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.912 W/kg

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

Reference Value = 23.71 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.737 W/kg; SAR(10 g) = 0.411 W/kg

Maximum value of SAR (measured) = 0.906 W/kg

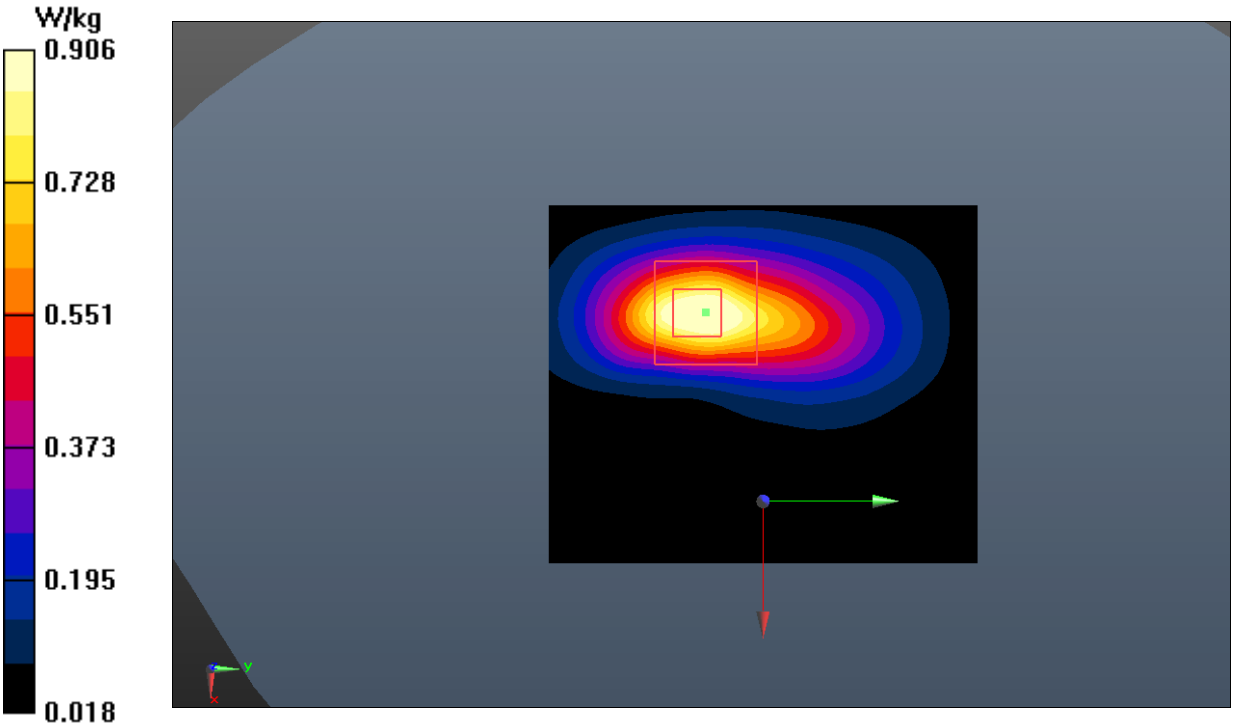

Fig.8 WCDMA Band 4 Body

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WCDMA Band 5 Head

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.919 S/m; ε_r = 40.669; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Left Cheek Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.699 W/kg

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

Reference Value = 21.85 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.516 W/kg; SAR(10 g) = 0.323 W/kg

Maximum value of SAR (measured) = 0.742 W/kg

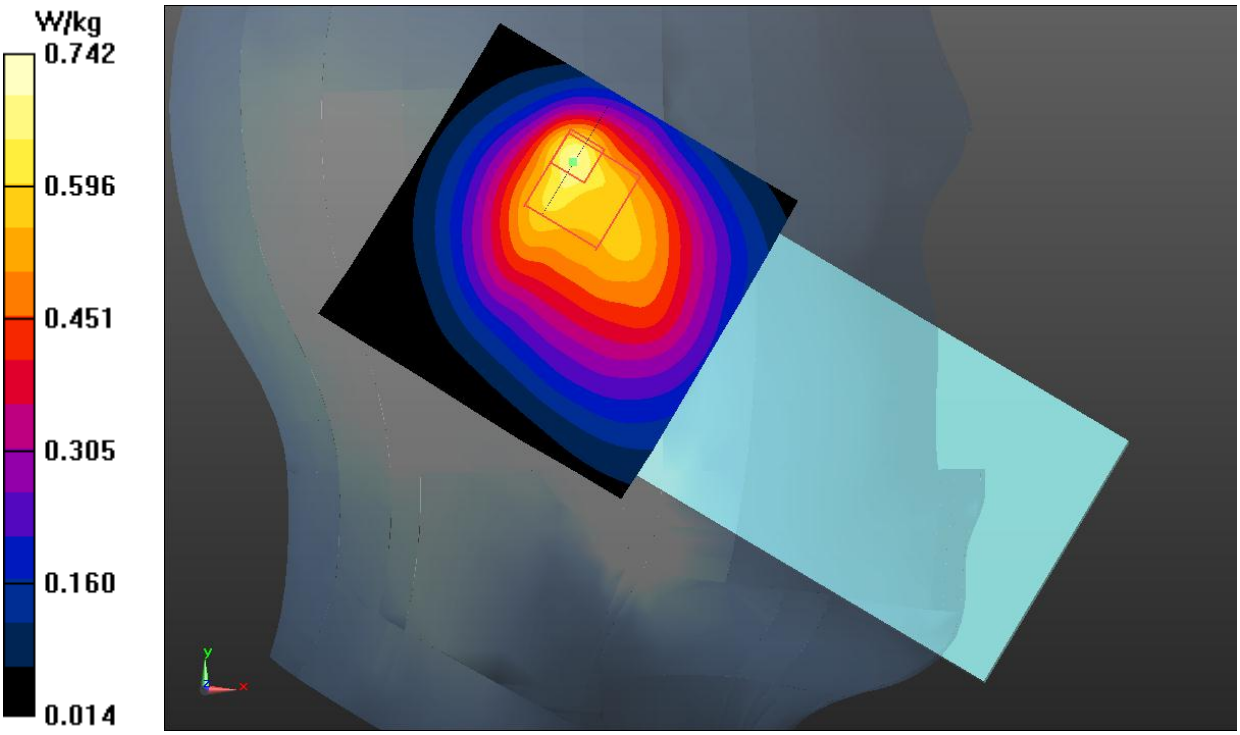

Fig.9 WCDMA Band 5 Head

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WCDMA Band 5 Body

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.919 S/m; ε_r = 40.669; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Rear Side Middle/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.778 W/kg

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

Reference Value = 22.08 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.956 W/kg

SAR(1 g) = 0.571 W/kg; SAR(10 g) = 0.349 W/kg

Maximum value of SAR (measured) = 0.692 W/kg

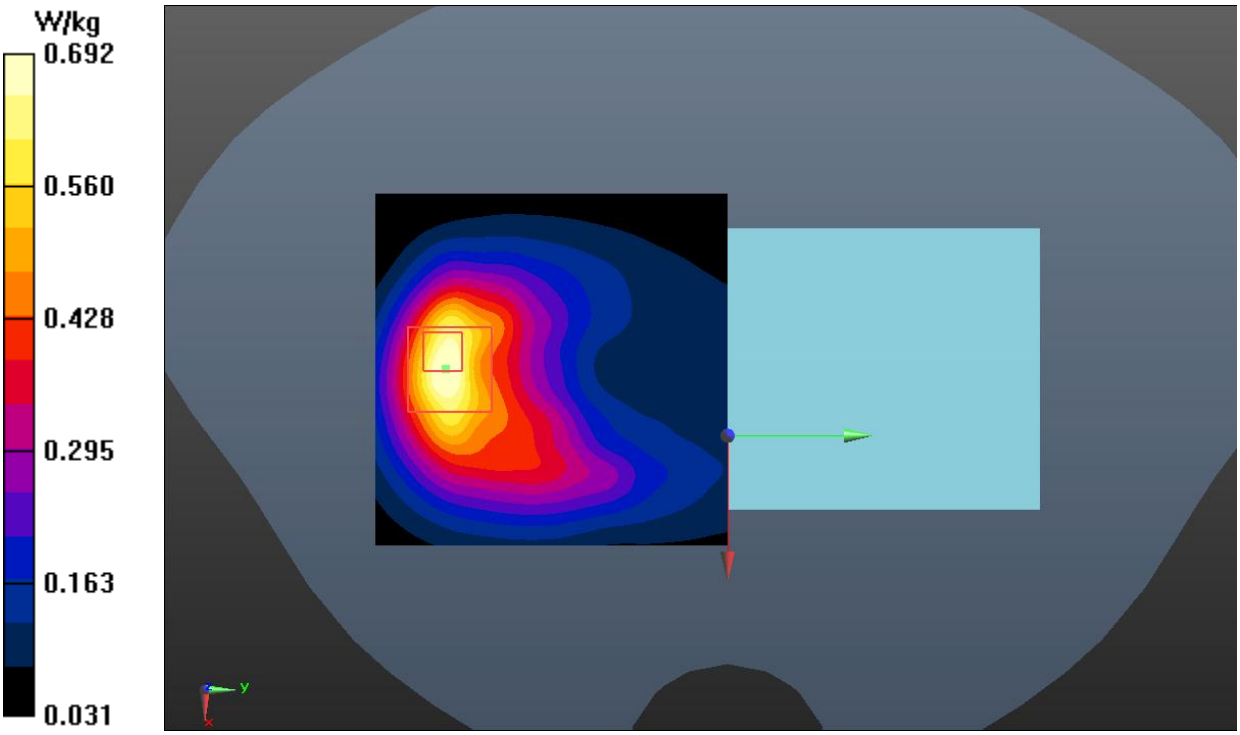

Fig.10 WCDMA Band 5 Body

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LTE Band 12 Head

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 750MHz

Medium parameters used: f = 708 MHz; σ = 0.854 S/m; ε_r = 42.988; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 707.5 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Left Cheek Middle 1RB_0/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.607 W/kg

Left Cheek Middle 1RB_0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.90 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.523 W/kg; SAR(10 g) = 0.323 W/kg

Maximum value of SAR (measured) = 0.668 W/kg

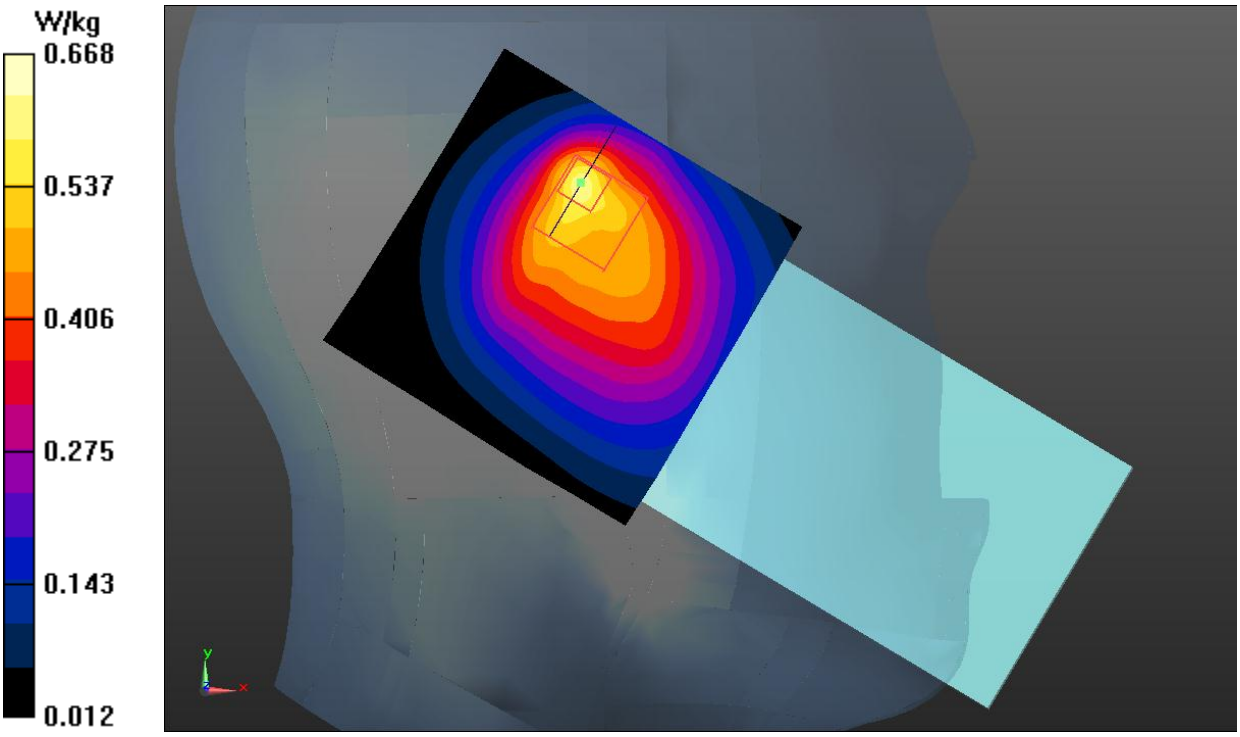

Fig.11 LTE Band 12 Head

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LTE Band 12 Body

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used: f = 708 MHz; σ = 0.854 S/m; ε_r = 42.988; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 707.5 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Rear Side Middle 1RB0/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.349 W/kg

Rear Side Middle 1RB0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.89 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.511 W/kg

SAR(1 g) = 0.283 W/kg; SAR(10 g) = 0.174 W/kg

Maximum value of SAR (measured) = 0.340 W/kg

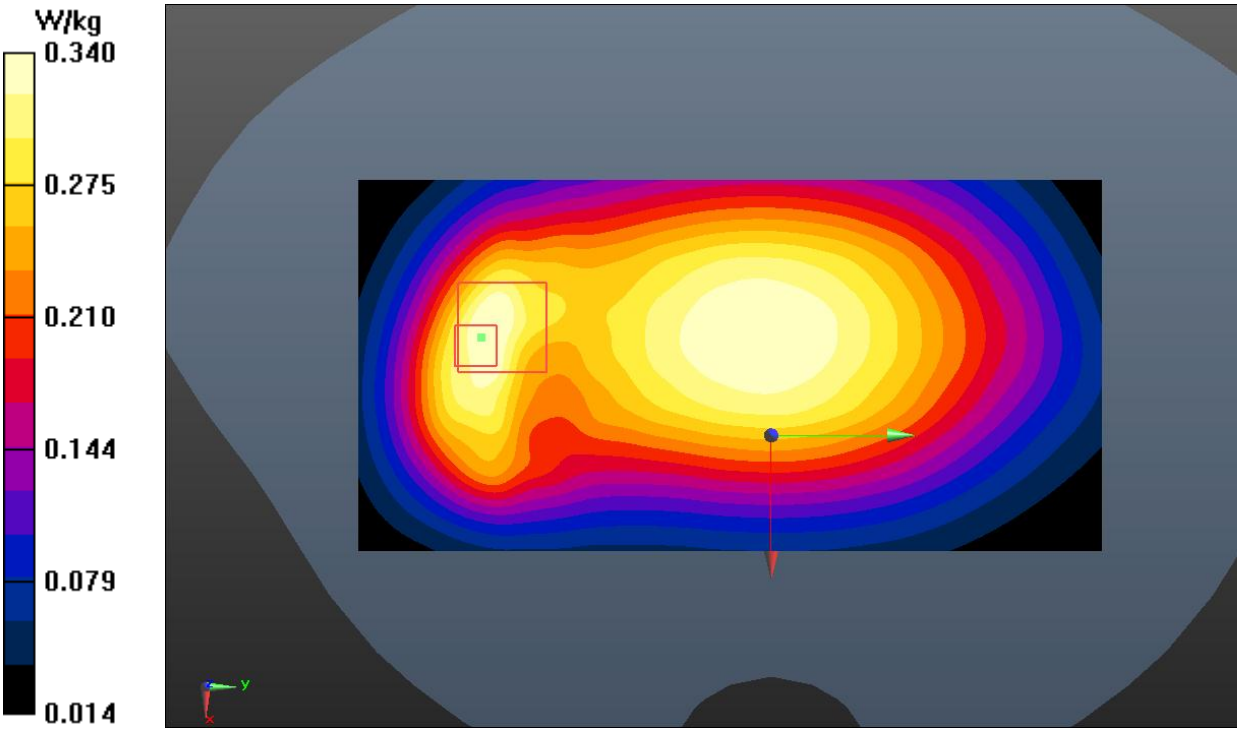

Fig.12 LTE Band 12 Body

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LTE Band 13 Head

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 750MHz

Medium parameters used: f = 782 MHz; σ = 0.901 S/m; ε_r = 42.101; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Right Cheek Middle 1RB0/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.403 W/kg

Right Cheek Middle 1RB0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.452 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.457 W/kg

SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.268 W/kg

Maximum value of SAR (measured) = 0.388 W/kg

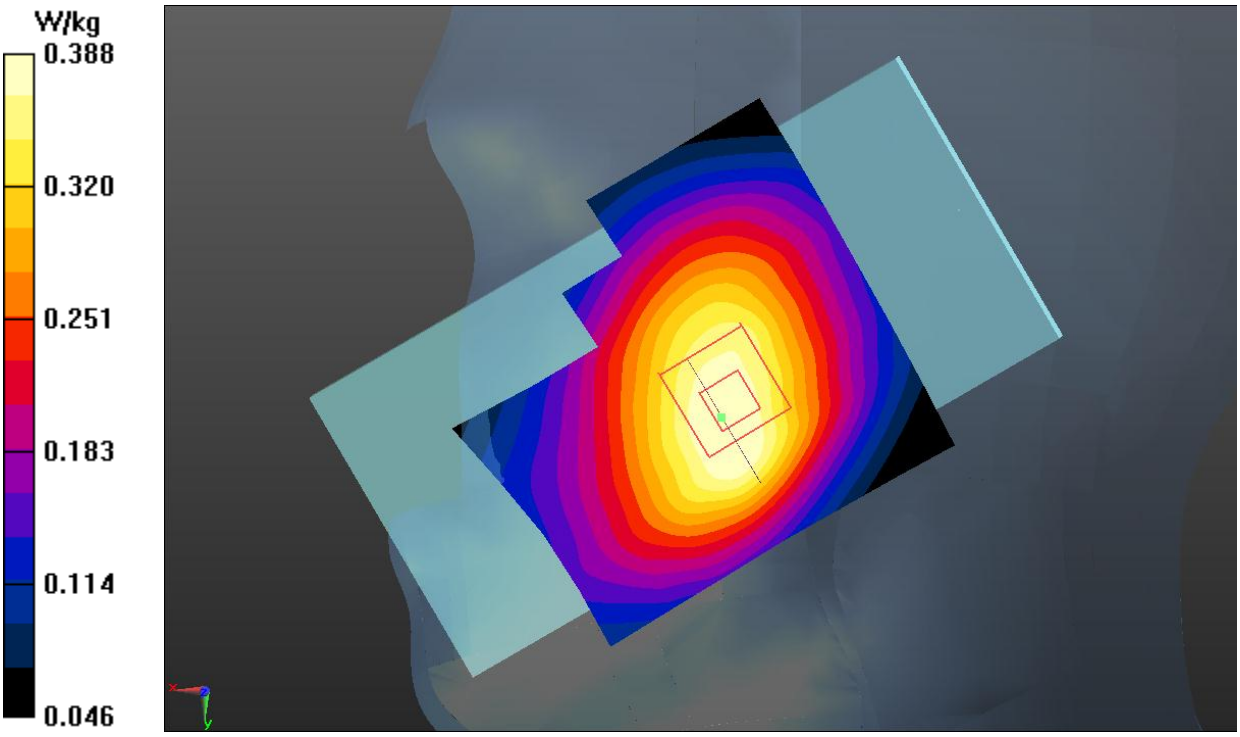

Fig.13 LTE Band 13 Head

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LTE Band 13 Body

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 750MHz

Medium parameters used: f = 782 MHz; σ = 0.901 S/m; ε_r = 42.101; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Rear Side Middle 1RB0/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.477 W/kg

Rear Side Middle 1RB0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.53 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.762 W/kg

SAR(1 g) = 0.390 W/kg; SAR(10 g) = 0.217 W/kg

Maximum value of SAR (measured) = 0.482 W/kg

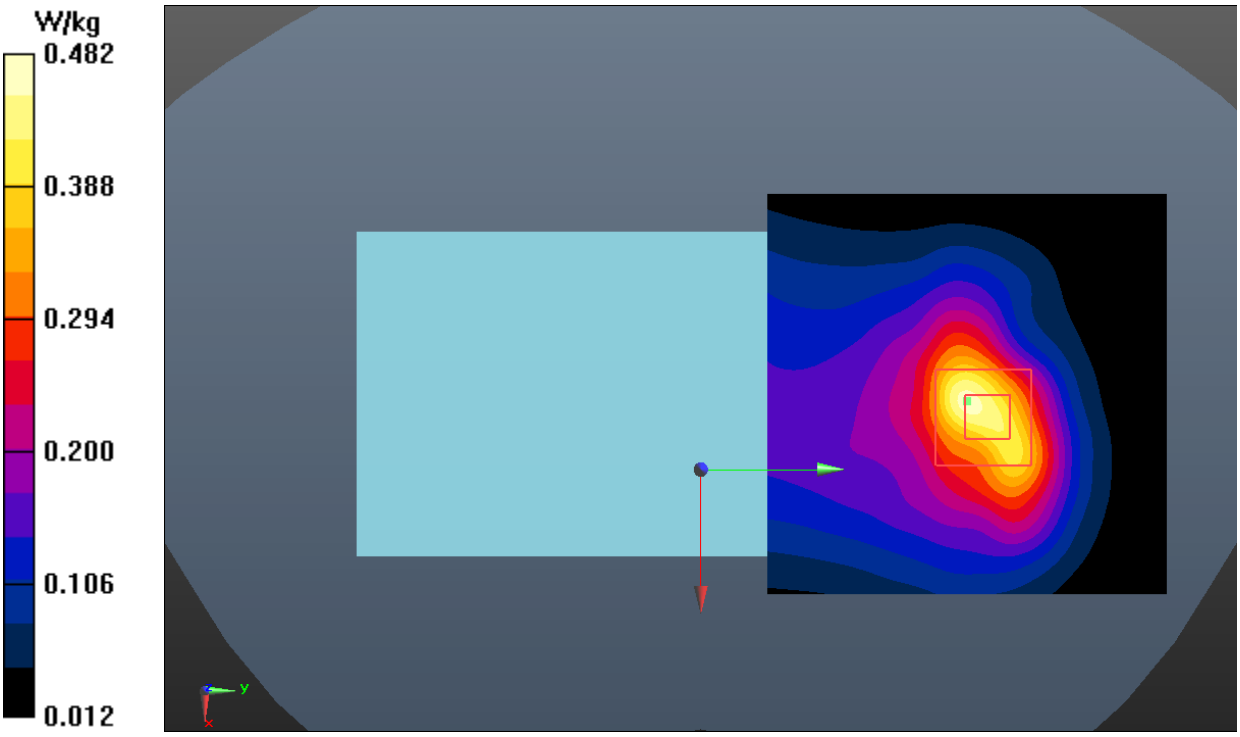

Fig.14 LTE Band 13 Body

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LTE Band 25 Head

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1905 MHz; σ = 1.423 S/m; ε_r = 38.833; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 1905 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

Right Cheek High 1RB_0/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.427 W/kg

Right Cheek High 1RB_0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.727 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.497 W/kg

SAR(1 g) = 0.332 W/kg; SAR(10 g) = 0.208 W/kg

Maximum value of SAR (measured) = 0.389 W/kg

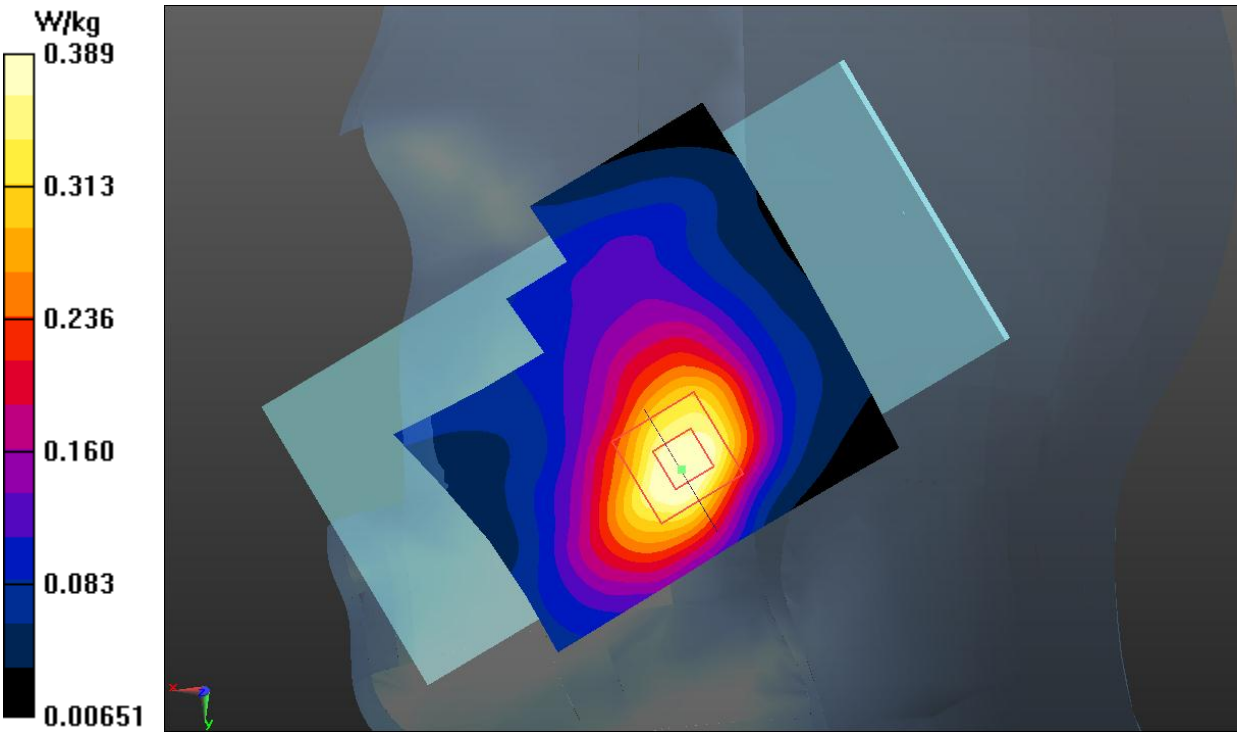

Fig.15 LTE Band 25 Head

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LTE Band 25 Body

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1860 MHz; σ = 1.384 S/m; ε_r = 39.008; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

Bottom Side Low 1RB_0/Area Scan (51x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.09 W/kg

Bottom Side Low 1RB_0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.783 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.800 W/kg; SAR(10 g) = 0.412 W/kg

Maximum value of SAR (measured) = 1.00 W/kg

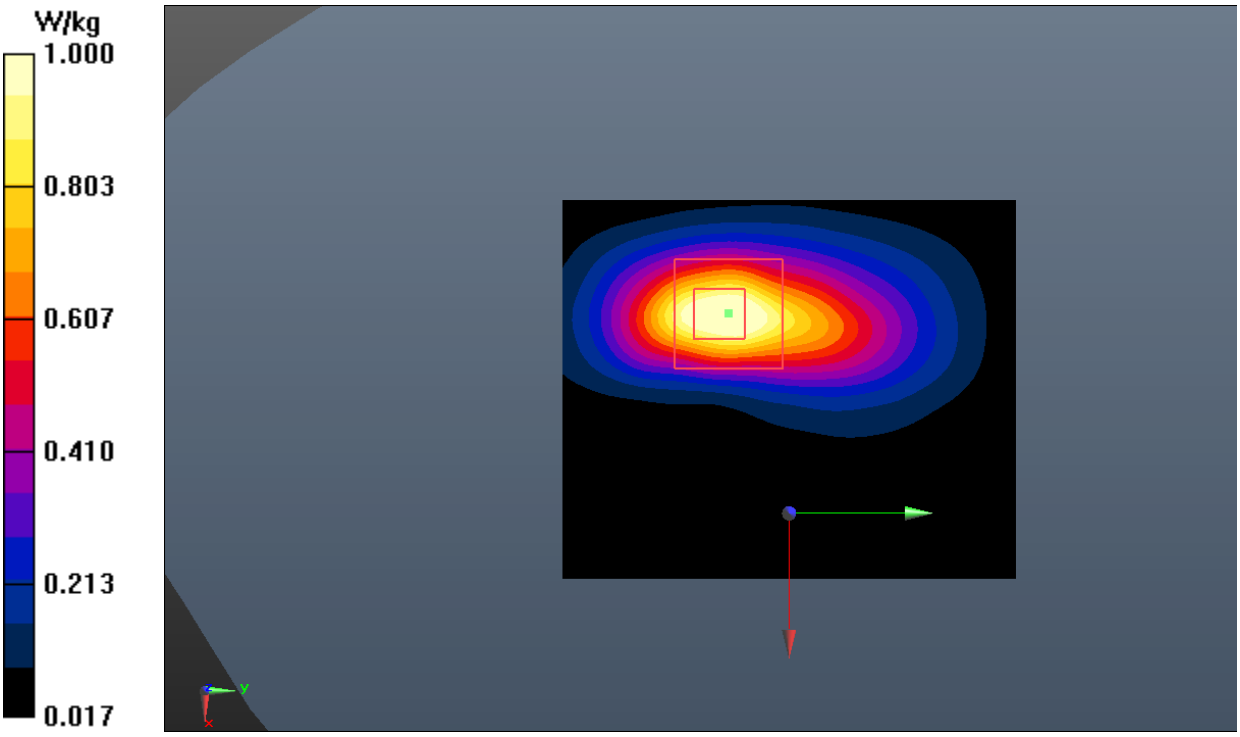

Fig.16 LTE Band 25 Body

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LTE Band 26 Head

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used (interpolated): f = 822.5 MHz; σ = 0.907 S/m; ε_r = 40.836; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 822.5 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Left Cheek Low 1RB_74/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.673 W/kg

Left Cheek Low 1RB_74/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.09 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.543 W/kg; SAR(10 g) = 0.358 W/kg

Maximum value of SAR (measured) = 0.656 W/kg

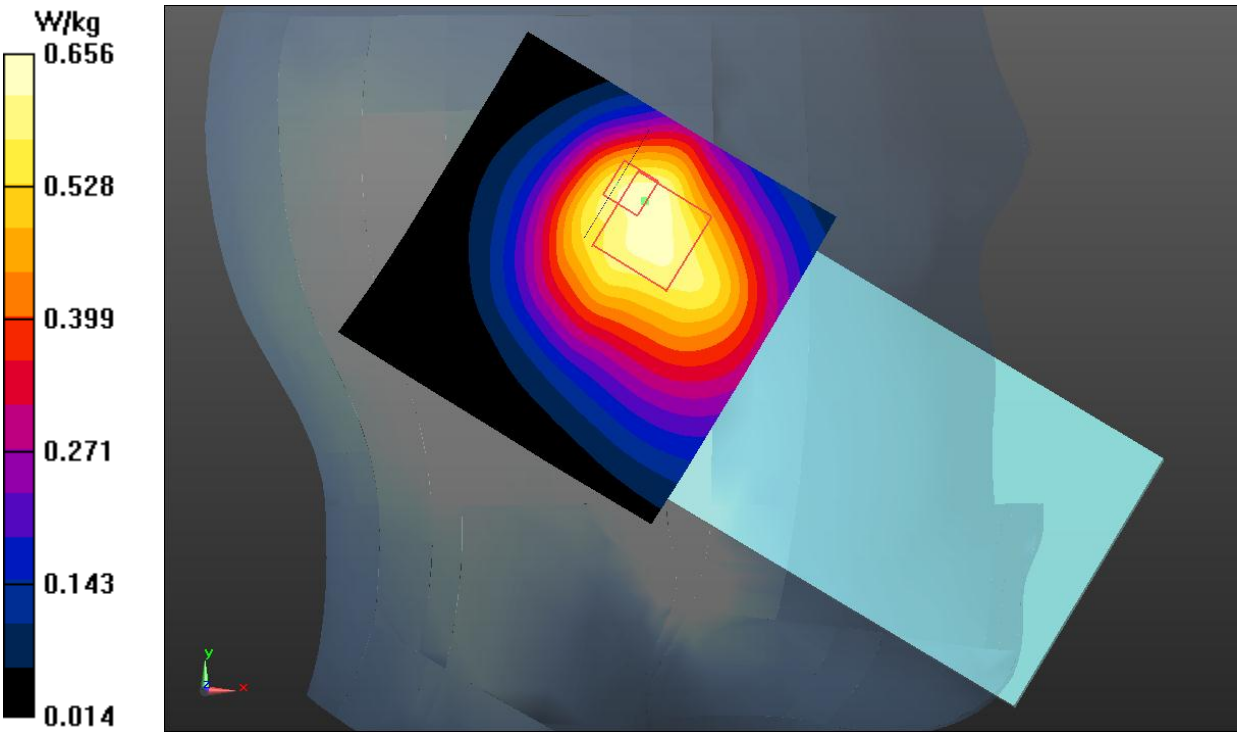

Fig.17 LTE Band 26 Head

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LTE Band 26 Body

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used (interpolated): f = 822.5 MHz; σ = 0.907 S/m; ε_r = 40.836; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 822.5 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Rear Side Low 1RB_74/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.577 W/kg

Rear Side Low 1RB_74/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.52 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.863 W/kg

SAR(1 g) = 0.488 W/kg; SAR(10 g) = 0.287 W/kg

Maximum value of SAR (measured) = 0.591 W/kg

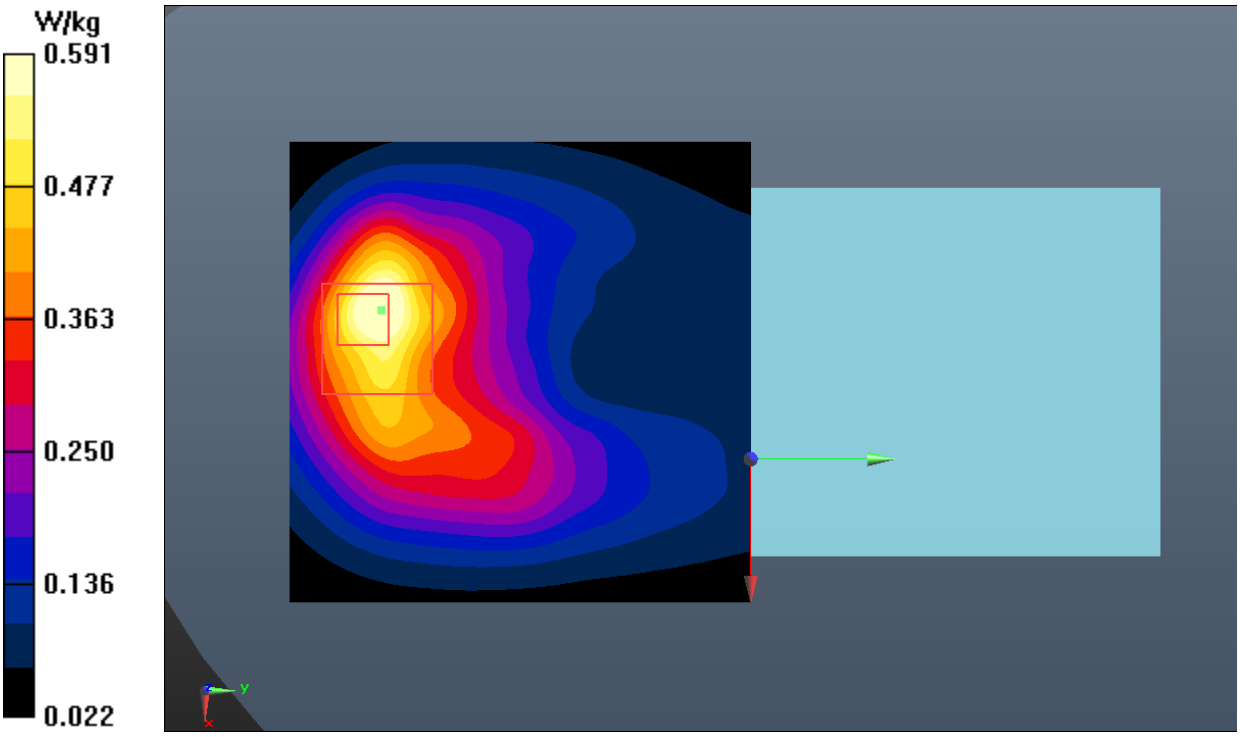

Fig.18 LTE Band 26 Body

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LTE Band 41 Head

Date: 2020-12-18

Electronics: DAE4 Sn786

Medium: Head 2550MHz

Medium parameters used: f = 2680 MHz; σ = 2.096 S/m; ε_r = 37.715; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:2.31

Probe: ES3DV3 – SN3151 ConvF (4.53, 4.53, 4.53);

Right Cheek High 1RB_50/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.117 W/kg

Right Cheek High 1RB_50/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.216 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.208 W/kg

SAR(1 g) = 0.122 W/kg; SAR(10 g) = 0.066 W/kg

Maximum value of SAR (measured) = 0.133 W/kg

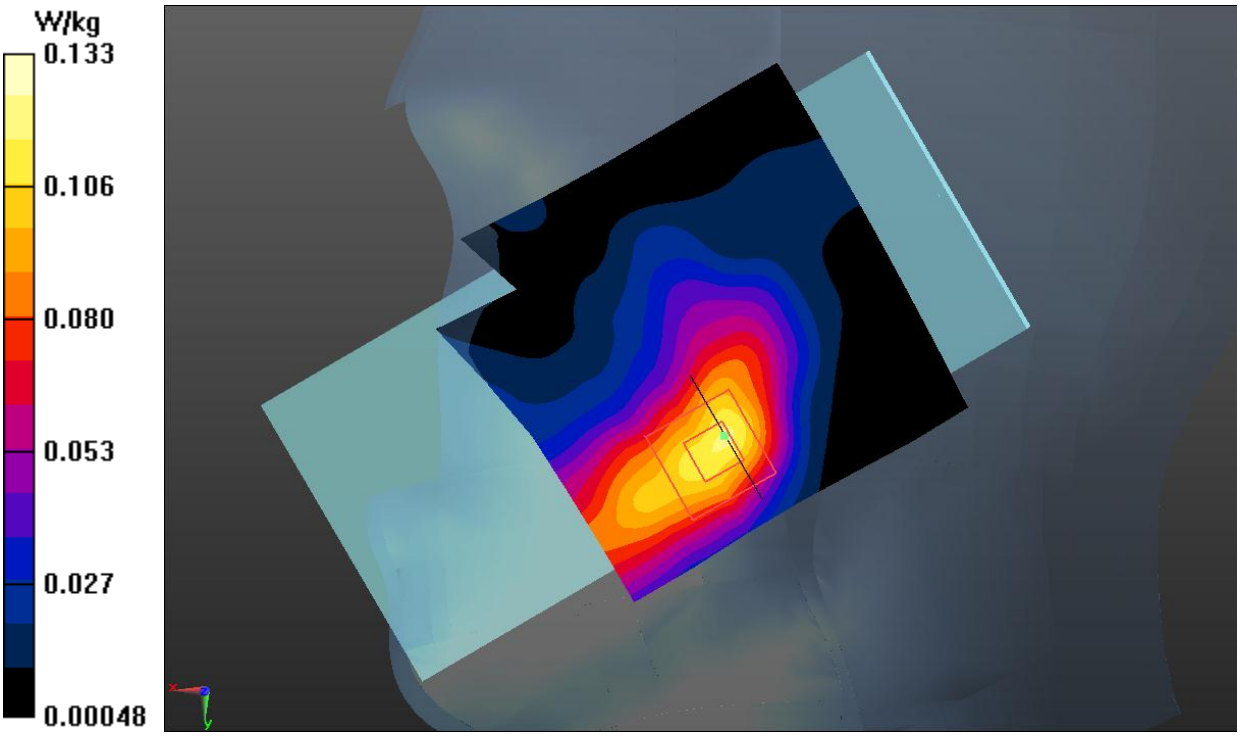

Fig.19 LTE Band 41 Head

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LTE Band 41 Body

Date: 2020-12-18

Electronics: DAE4 Sn786

Medium: Head 2550MHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 1.994 S/m; ε_r = 38.002; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_TDD (0) Frequency: 2593 MHz Duty Cycle: 1:1.58

Probe: ES3DV3 – SN3151 ConvF (4.53, 4.53, 4.53);

Rear Side Middle 50RB_0/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Rear Side Middle 50RB_0/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.363 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.86 W/kg

SAR(1 g) = 0.865 W/kg; SAR(10 g) = 0.412 W/kg

Maximum value of SAR (measured) = 1.10 W/kg

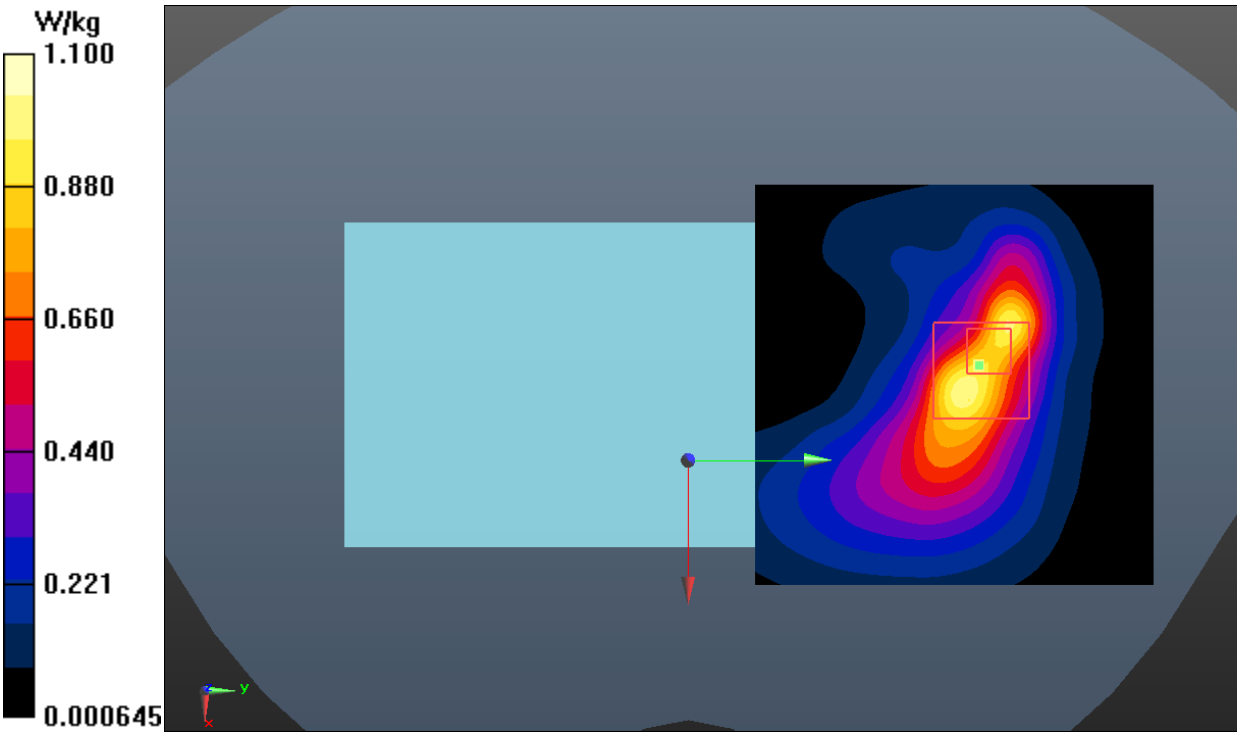

Fig.20 LTE Band 41 Body

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LTE Band 66 Head

Date: 2020-12-15

Electronics: DAE4 Sn786

Medium: Head 1750MHz

Medium parameters used: f = 1745 MHz; σ = 1.381 S/m; ε_r = 39.443; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 1745 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.23, 5.23, 5.23);

Left Cheek Middle 1RB_99/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.503 W/kg

Left Cheek Middle 1RB_99/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.534 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.680 W/kg

SAR(1 g) = 0.454 W/kg; SAR(10 g) = 0.294 W/kg

Maximum value of SAR (measured) = 0.532 W/kg

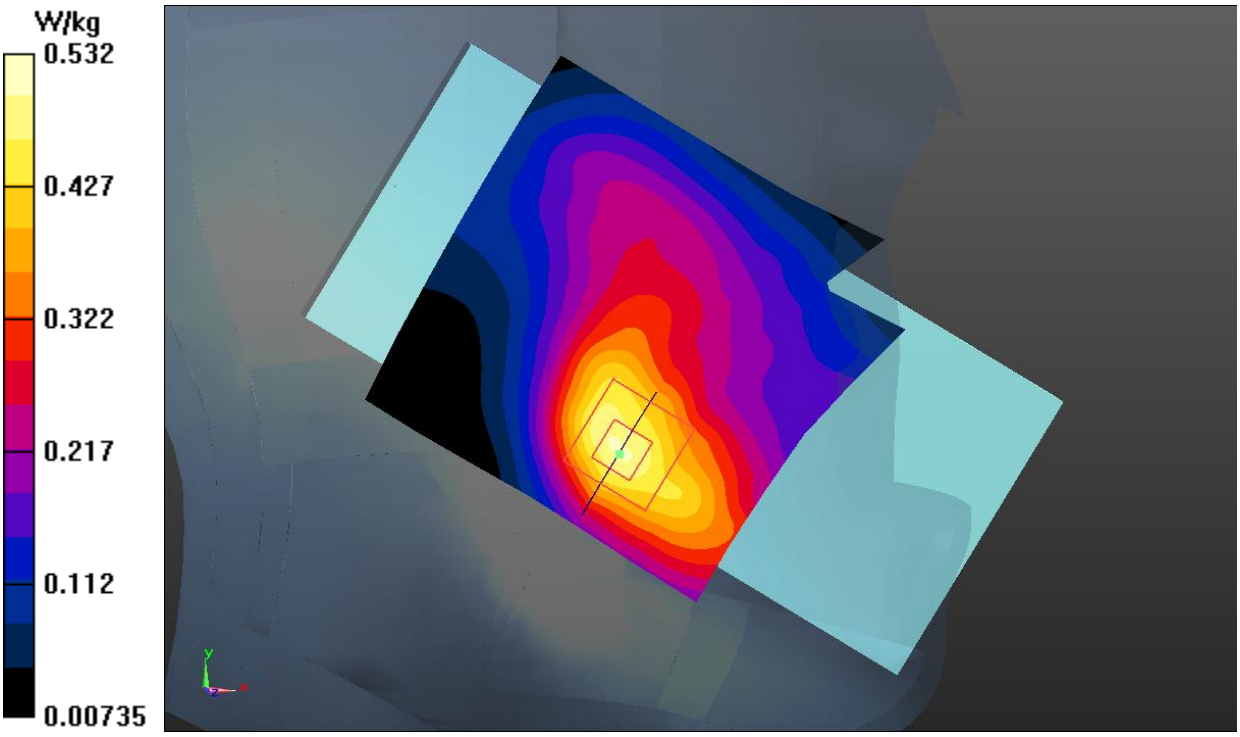

Fig.21 LTE Band 66 Head

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LTE Band 66 Body

Date: 2020-12-15

Electronics: DAE4 Sn786

Medium: Head 1750MHz

Medium parameters used: f = 1720 MHz; σ = 1.359 S/m; ε_r = 39.54; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.23, 5.23, 5.23);

Rear Side Low 1RB_99/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.884 W/kg

Rear Side Low 1RB_99/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.738 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.749 W/kg; SAR(10 g) = 0.451 W/kg

Maximum value of SAR (measured) = 0.899 W/kg

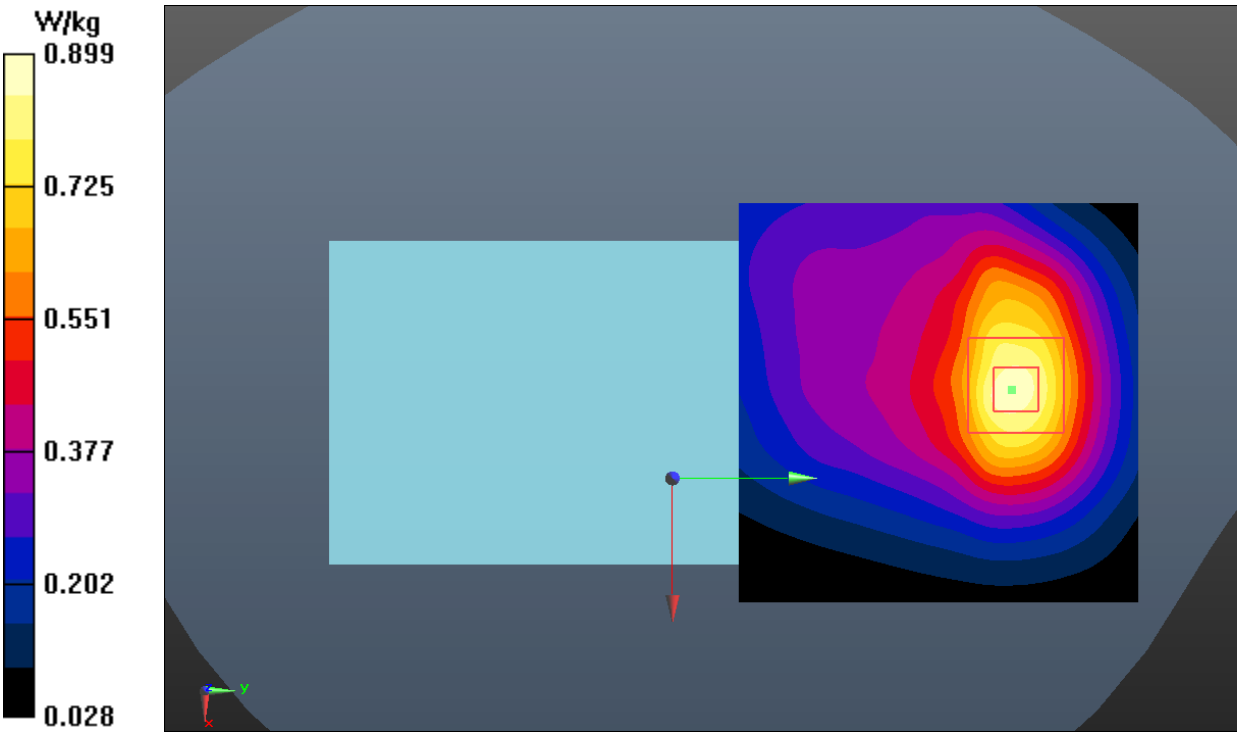

Fig.22 LTE Band 66 Body

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LTE Band 71 Head

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 750MHz

Medium parameters used: f = 688 MHz; σ = 0.851 S/m; ε_r = 43.228; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 688 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Left Cheek High 50RB_0/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.870 W/kg

Left Cheek High 50RB_0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.97 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.548 W/kg; SAR(10 g) = 0.274 W/kg

Maximum value of SAR (measured) = 0.781 W/kg

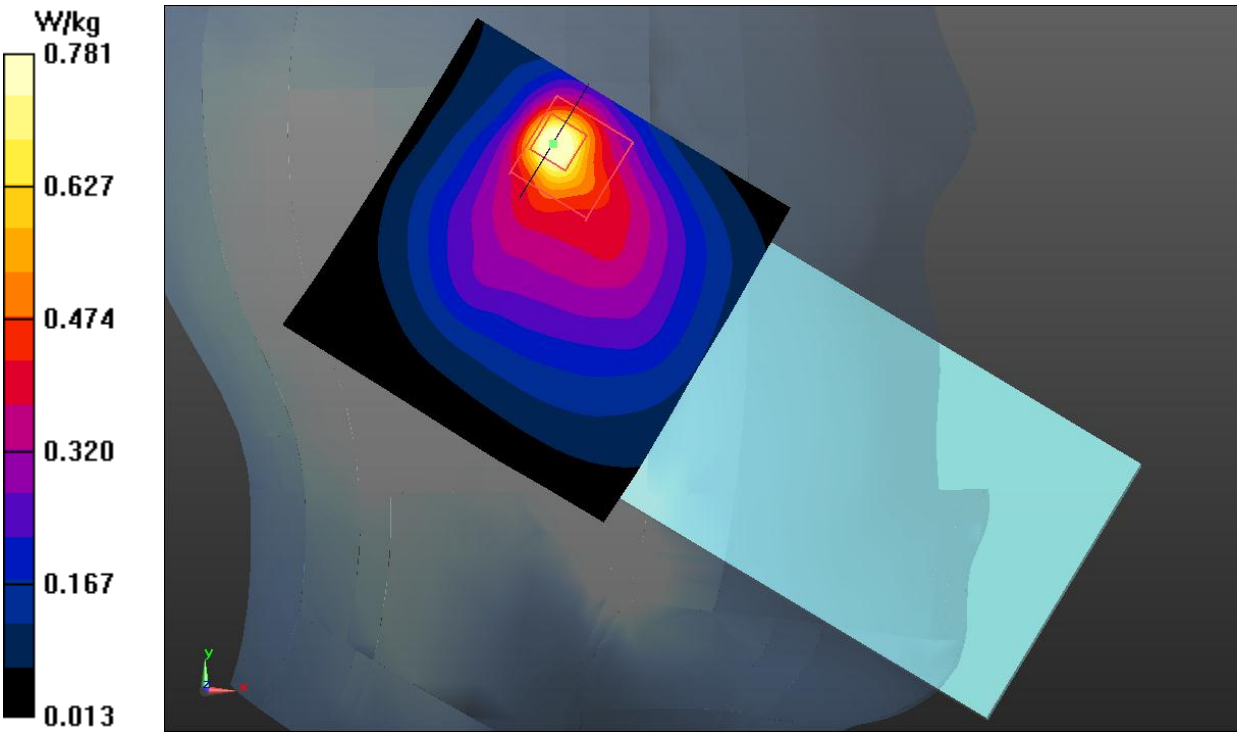

Fig.23 LTE Band 71 Head

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LTE Band 71 Body

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 750MHz

Medium parameters used: f = 688 MHz; σ = 0.851 S/m; ε_r = 43.228; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, LTE_FDD (0) Frequency: 688 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

Rear Side High 1RB_0/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.420 W/kg

Rear Side High 1RB_0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.89 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.596 W/kg

SAR(1 g) = 0.354 W/kg; SAR(10 g) = 0.233 W/kg

Maximum value of SAR (measured) = 0.416 W/kg

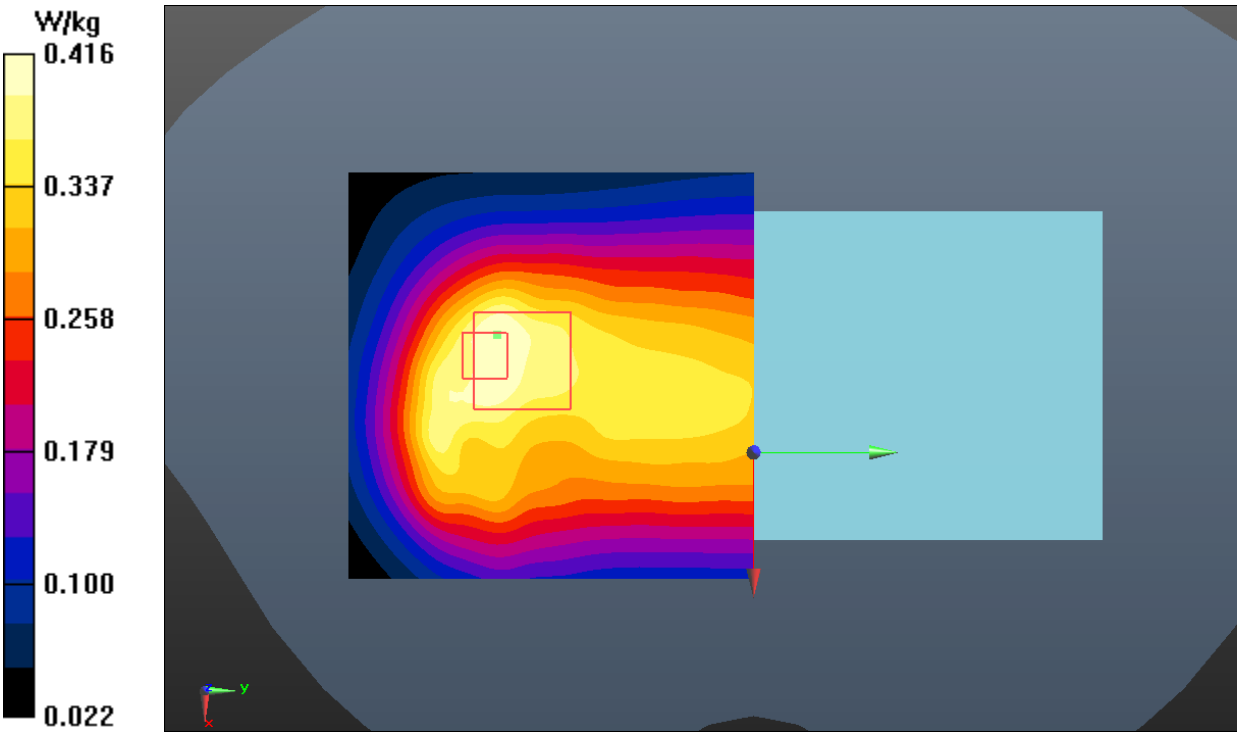

Fig.24 LTE Band 71 Body

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WLAN 2.4G Head

Date: 2020-12-23

Electronics: DAE4 Sn786

Medium: Head 2450MHz

Medium parameters used: f = 2462 MHz; σ = 1.852 S/m; ε_r = 38.329; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WiFi (0) Frequency: 2462 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (4.68, 4.68, 4.68);

Right Cheek High/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.980 W/kg

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

Reference Value = 9.304 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 0.693 W/kg; SAR(10 g) = 0.328 W/kg

Maximum value of SAR (measured) = 0.877 W/kg

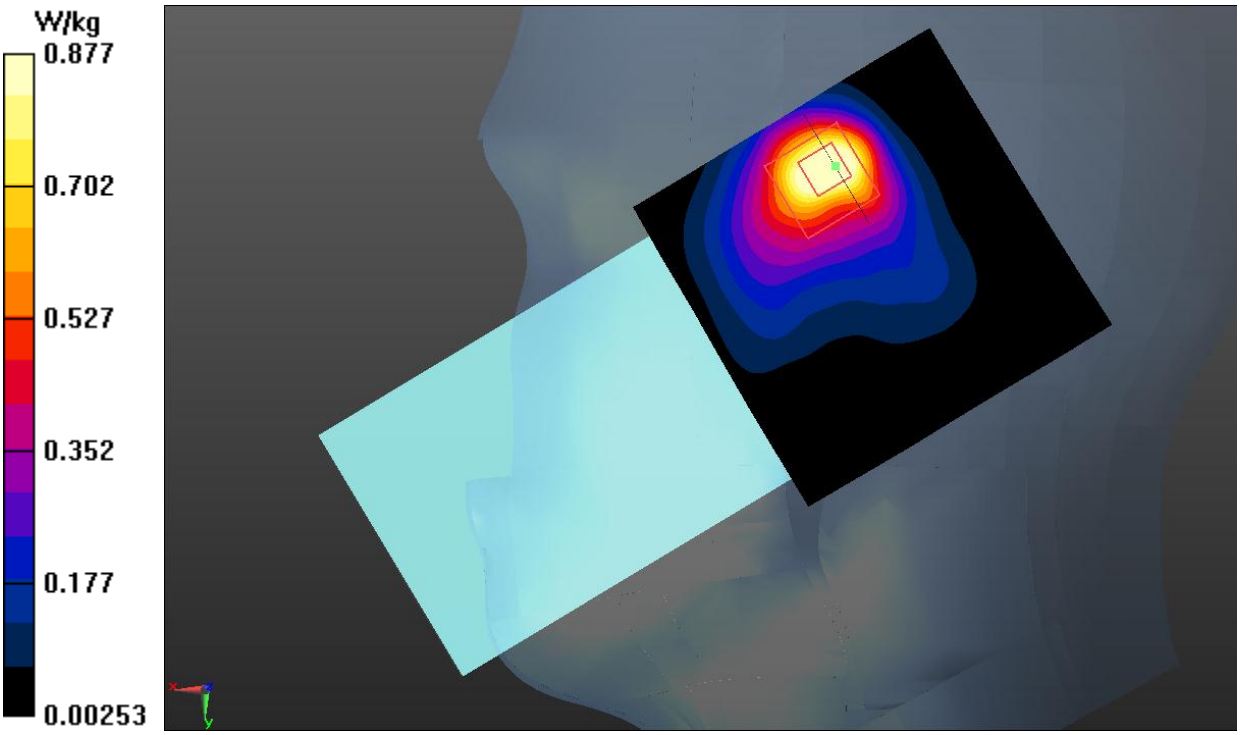

Fig.25 WLAN 2.4G Head

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WLAN 2.4G Body

Date: 2020-12-23

Electronics: DAE4 Sn786

Medium: Head 2450MHz

Medium parameters used: f = 2462 MHz; σ = 1.852 S/m; ε_r = 38.329; ρ = 1000 kg/m^3

Ambient Temperature: 22.0^{o}C Liquid Temperature: 21.5^{o}C

Communication System: UID 0, WiFi (0) Frequency: 2462 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (4.68, 4.68, 4.68);

Rear Side High/Area Scan (111x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.490 W/kg

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

Reference Value = 3.789 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.824 W/kg

SAR(1 g) = 0.373 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.486 W/kg

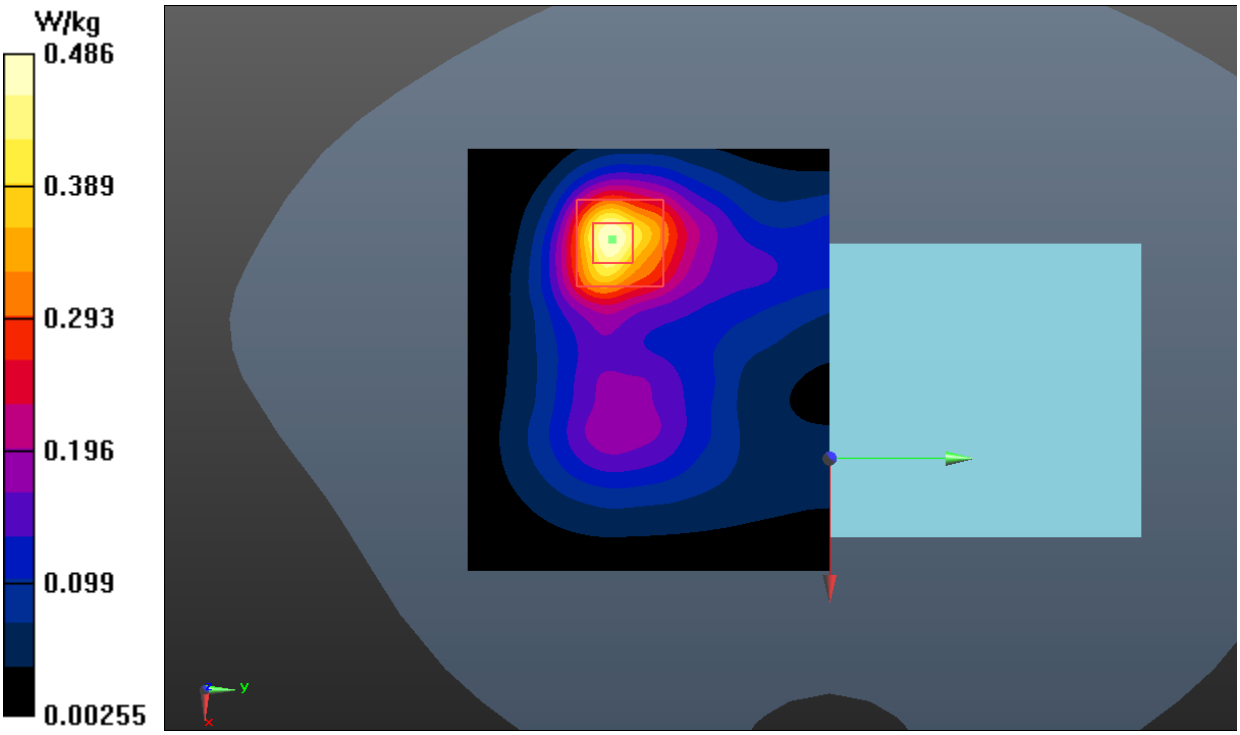

Fig.26 WLAN 2.4G Body

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ANNEX B: SystemVerification Results

750MHz

Date: 2020-12-20

Electronics: DAE4 Sn786

Medium: Head 750MHz

Medium parameters used: f = 750 MHz; σ = 0.881 S/m; ε_r = 42.484; ρ = 1000 kg/m^3

Ambient Temperature: 22.5^{o}C Liquid Temperature: 22.0^{o}C

Communication System: CW_TMC Frequency: 750 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

System Validation /Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 59.783 V/m; Power Drift = -0.03 dB

SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (interpolated) = 2.65 W/kg

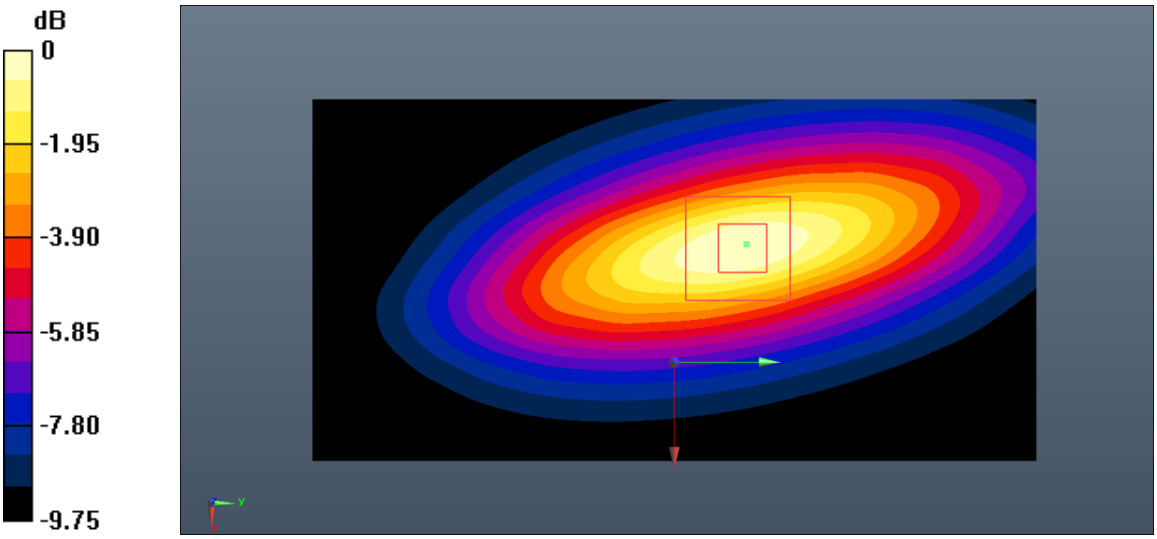
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.783 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.95 W/kg

SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (measured) = 2.61 W/kg



0 dB = 2.61 W/kg = 4.17 dB W/kg

Fig.B.1. Validation 750MHz 250mW

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835MHz

Date: 2020-12-21

Electronics: DAE4 Sn786

Medium: Head 835MHz

Medium parameters used: f = 835 MHz; σ = 0.918 S/m; εr = 40.686; ρ = 1000 kg/m^3

Ambient Temperature: 22.5^{o}C Liquid Temperature: 22.0^{o}C

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

Probe: ES3DV3 – SN3151 ConvF (6.41, 6.41, 6.41);

System Validation /Area Scan (91x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 62.536 V/m; Power Drift = 0.07 dB

SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.58 W/kg

Maximum value of SAR (interpolated) = 3.23 W/kg

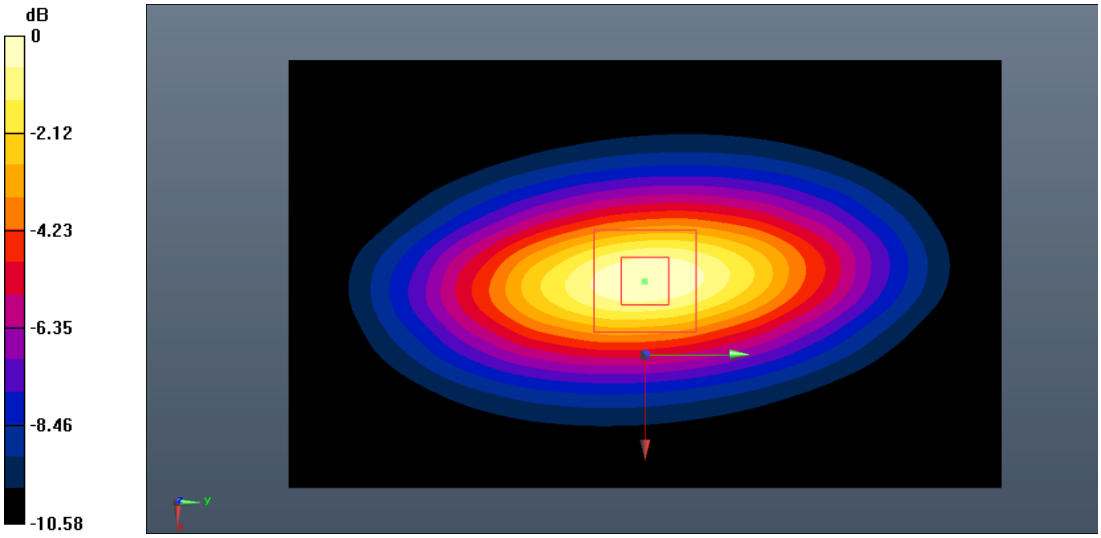
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 62.536 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 3.89 W/kg

SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.60 W/kg

Maximum value of SAR (measured) = 3.28 W/kg



0 dB = 3.28 W/kg = 5.16 dB W/kg

Fig.B.2. Validation 835MHz 250mW

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1750MHz

Date: 2020-12-15

Electronics: DAE4 Sn786

Medium: Head 1750MHz

Medium parameters used: f = 1750 MHz; σ = 1.385 S/m; ε_r = 39.423; ρ = 1000 kg/m^3

Ambient Temperature: 22.2^{o}C Liquid Temperature: 21.7^{o}C

Communication System: CW_TMC Frequency: 1750 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.23, 5.23, 5.23);

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 80.519 V/m; Power Drift = 0.10 dB

SAR(1 g) = 9.35 W/kg; SAR(10 g) = 4.87 W/kg

Maximum value of SAR (interpolated) = 10.5 W/kg

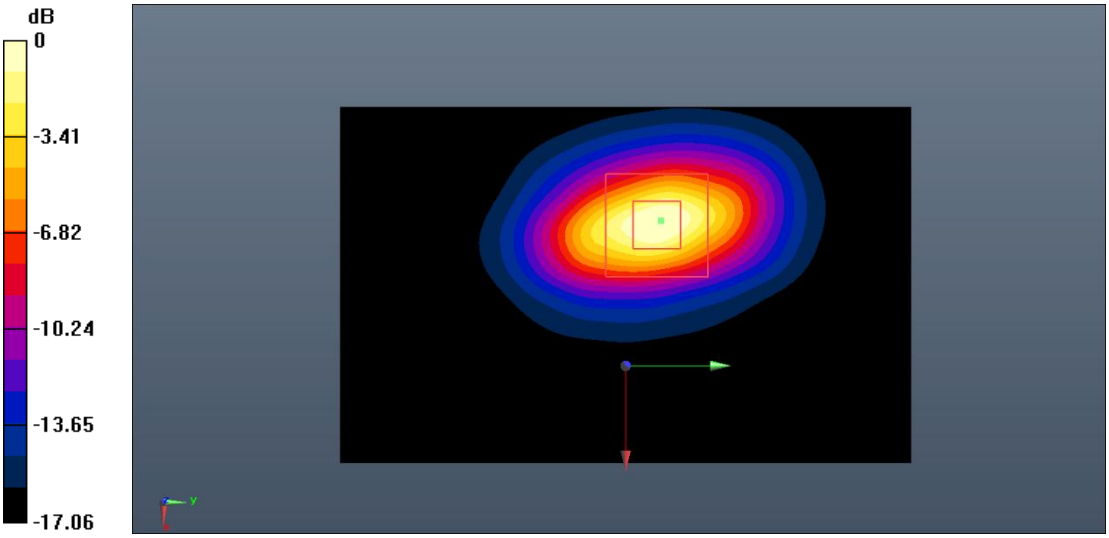
System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 80.519 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 21.1 W/kg

SAR(1 g) = 9.52 W/kg; SAR(10 g) = 4.94 W/kg

Maximum value of SAR (measured) = 10.8 W/kg



0 dB = 10.8 W/kg = 10.33 dB W/kg

Fig.B.3. Validation 1750MHz 250mW

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1900MHz

Date: 2020-12-14

Electronics: DAE4 Sn786

Medium: Head 1900MHz

Medium parameters used: f = 1900 MHz; σ = 1.419 S/m; ε_r = 38.852; ρ = 1000 kg/m^3

Ambient Temperature: 22.5^{o}C Liquid Temperature: 22.0^{o}C

Communication System: CW_TMC Frequency: 1900 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (5.11, 5.11, 5.11);

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 82.855 V/m; Power Drift = 0.08 dB

SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.25 W/kg

Maximum value of SAR (interpolated) = 11.8 W/kg

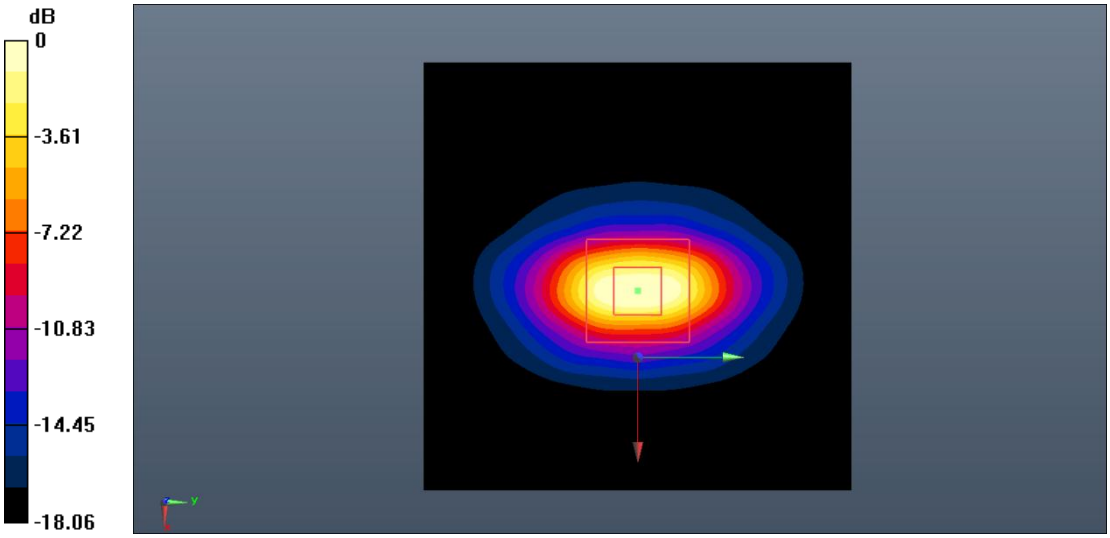
System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.855 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 24.1 W/kg

SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.32 W/kg

Maximum value of SAR (measured) = 12.0 W/kg



0 dB = 12.0 W/kg = 10.79 dB W/kg

Fig.B.4. Validation 1900MHz 250mW

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2450MHz

Date: 2020-12-23

Electronics: DAE4 Sn786

Medium: Head 2450MHz

Medium parameters used: f = 2450 MHz; σ = 1.838 S/m; ε_r = 38.369; ρ = 1000 kg/m^3

Ambient Temperature: 22.3^{o}C Liquid Temperature: 21.8^{o}C

Communication System: CW_TMC Frequency: 2450 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (4.68, 4.68, 4.68);

System Validation /Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 88.724 V/m; Power Drift = 0.02 dB

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.04 W/kg

Maximum value of SAR (interpolated) = 15.2 W/kg

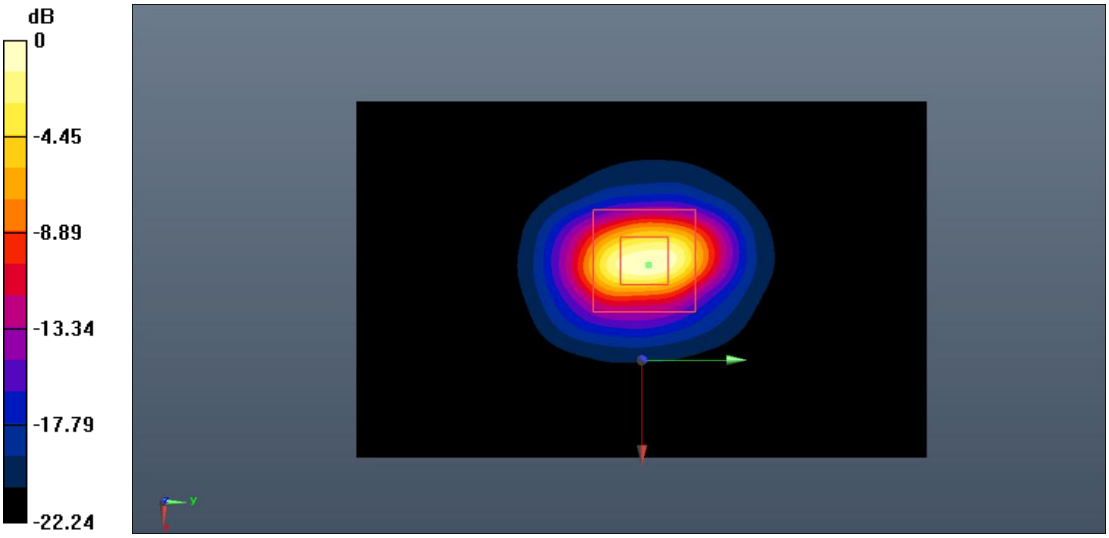
System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.724 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 28.6 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.11 W/kg

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



0 dB = 15.5 W/kg = 11.90 dB W/kg

Fig.B.5. Validation 2450MHz 250mW

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2550MHz

Date: 2020-12-18

Electronics: DAE4 Sn786

Medium: Head 2550MHz

Medium parameters used: f = 2550 MHz; σ = 1.943 S/m; ε_r = 38.144; ρ = 1000 kg/m^3

Ambient Temperature: 22.5^{o}C Liquid Temperature: 22.0^{o}C

Communication System: CW_TMC Frequency: 2550 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (4.53, 4.53, 4.53);

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 93.313 V/m; Power Drift = 0.05 dB

SAR(1 g) = 14.8 W/kg; SAR(10 g) = 6.66 W/kg

Maximum value of SAR (interpolated) = 16.5 W/kg

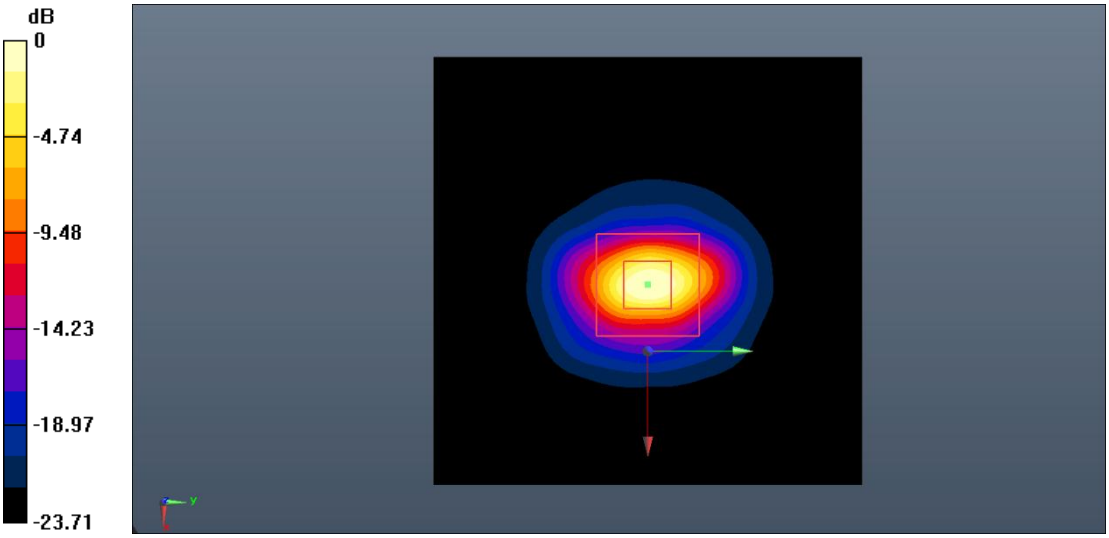
System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.313 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 35.4 W/kg

SAR(1 g) = 15.0 W/kg; SAR(10 g) = 6.82 W/kg

Maximum value of SAR (measured) = 16.8 W/kg



0 dB = 16.8 W/kg = 12.25 dB W/kg

Fig.B.6. Validation 2550MHz 250mW

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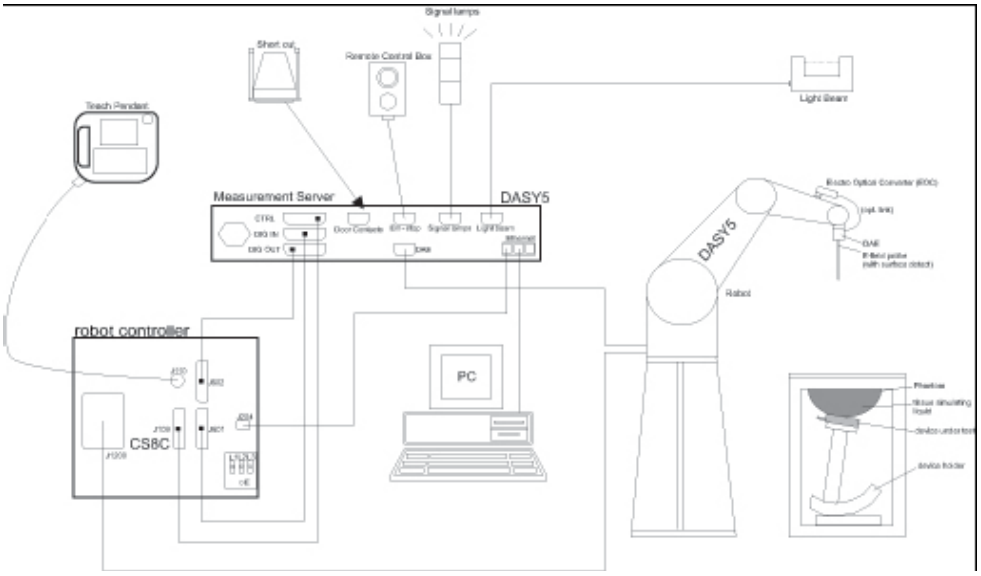
ANNEX C: SAR Measurement Setup

C.1. Measurement Set-up

DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

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C.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection durning a software approach and looks for the maximum using 2ndord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency 10MHz — 6.0GHz(EX3DV4)
Range: 10MHz — 4GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity: ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
Dynamic Range: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application: SAR Dosimetry Testing
Compliance tests of mobile phones
Dosimetry in strong gradient fields

Picture C.2 Near-field Probe

Picture C.3 E-field Probe

C.3. E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed

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in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/ cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4. Other Test Equipment

C.4.1. Data Acquisition Electronics (DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

PictureC.4: DAE

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C.4.2. Robot

The SPEAG DASY system uses the high precision robots (DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5 DASY 5

C.4.3. Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5:128MB), RAM (DASY5:128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture C.6 Server for DASY 5

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C.4.4. Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

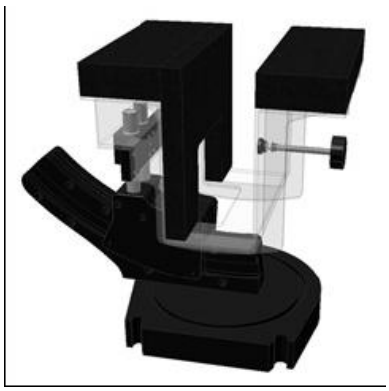
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

Picture C.7-1: Device Holder



Picture C.7-2: Laptop Extension Kit

C.4.5. Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to

Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

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Shell Thickness: 2 ± 0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

Picture C.8: SAM Twin Phantom

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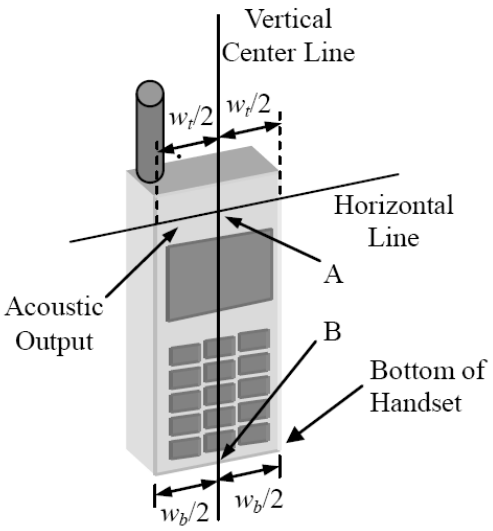
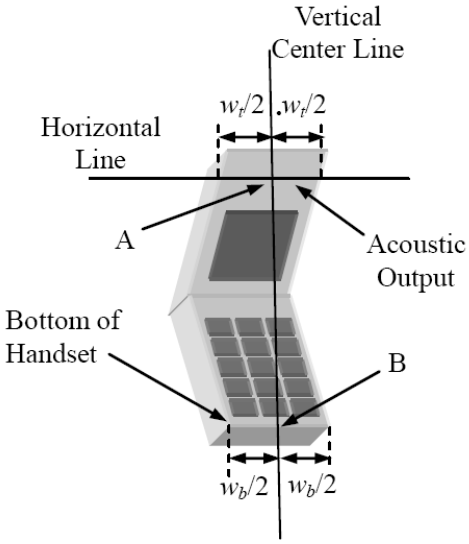
ANNEX D: Position of the wireless device in relation to the phantom

D.1. General considerations

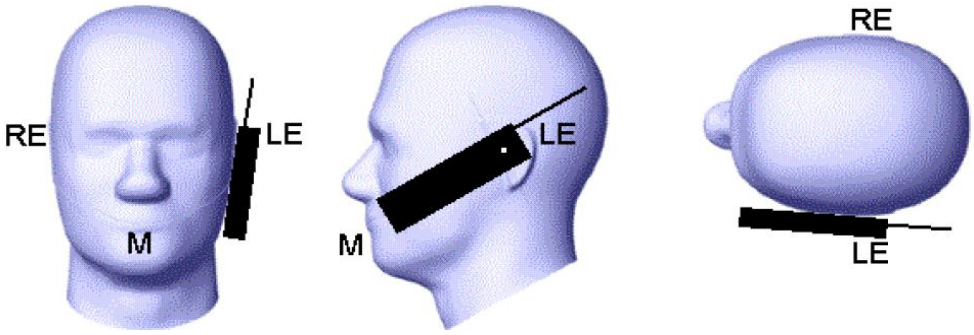
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.





w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Picture D.1-a Typical “fixed” case handset **Picture D.1-b Typical “clam-shell” case handset**



Picture D.2 Cheek position of the wireless device on the left side of SAM

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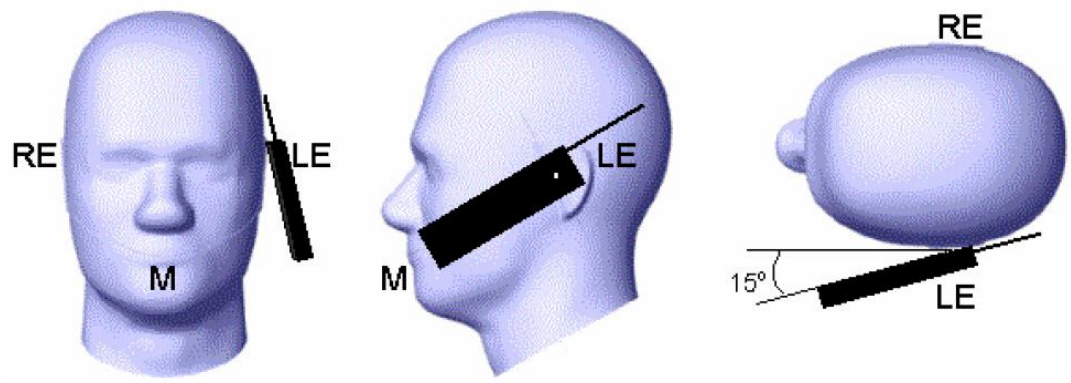
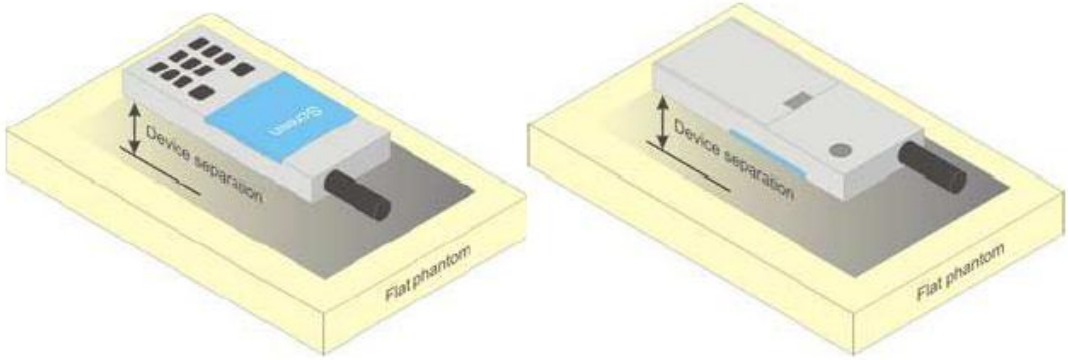


Picture D.3 Tilt position of the wireless device on the left side of SAM

D.2. Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.



Picture D.4 Test positions for body-worn devices

D.3. Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture 8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.

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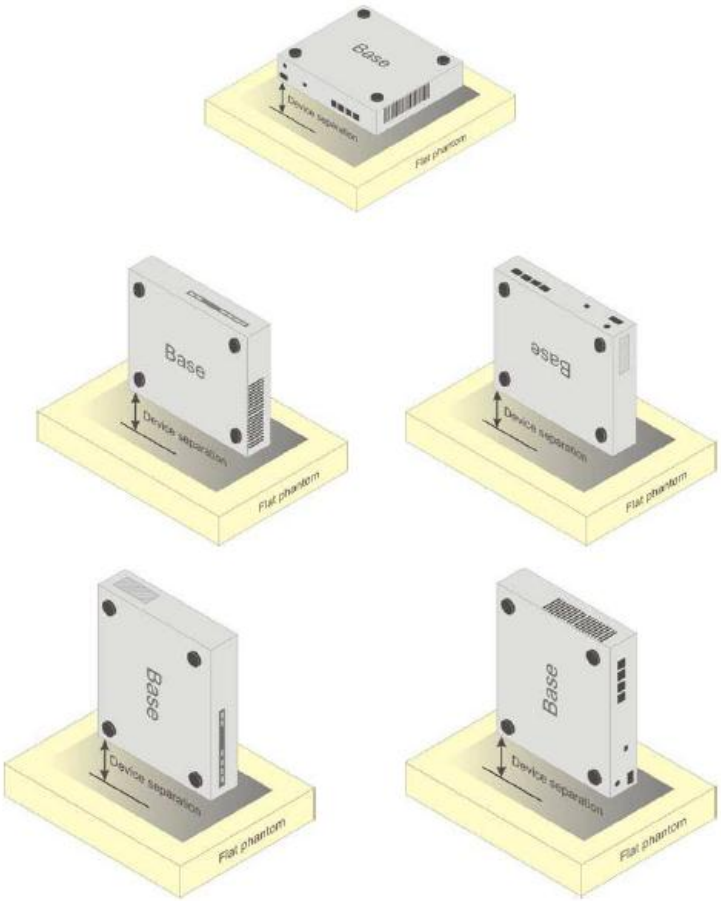

Picture D.5 Test positions for desktop devices

D.4. DUT Setup Photos

Picture D.6

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