Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.8 Ω - 5.7 jΩ
Return Loss	- 24.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.153 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 26.07.2021

Test Laboratory: SPEAG, Zurich, Switzerland

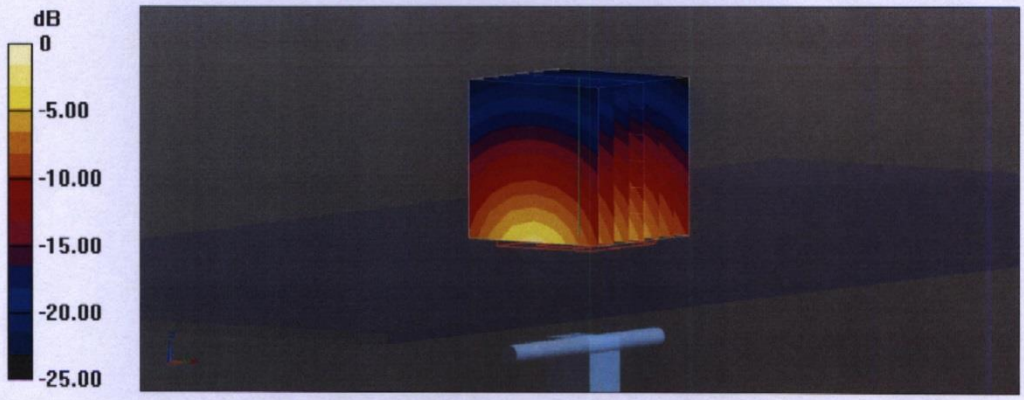
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1012

Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.05 S/m; ε_r = 37.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

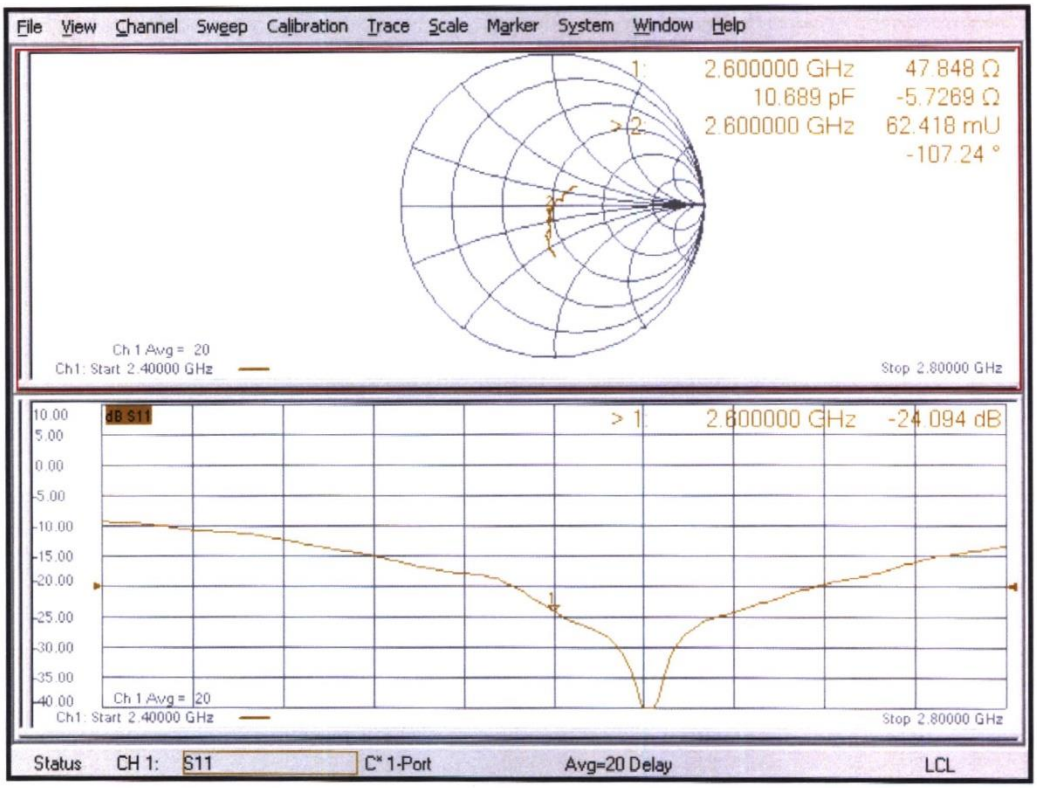
- Probe: EX3DV4 - SN7349; ConvF(7.84, 7.84, 7.84) @ 2600 MHz; Calibrated: 28.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 118.6 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 29.5 W/kg
SAR(1 g) = 14.7 W/kg; SAR(10 g) = 6.48 W/kg
Smallest distance from peaks to all points 3 dB below = 8.9 mm
Ratio of SAR at M2 to SAR at M1 = 49.6%
Maximum value of SAR (measured) = 24.4 W/kg



0 dB = 24.4 W/kg = 13.87 dBW/kg

Impedance Measurement Plot for Head TSL



ANNEX I Variant Product Test

I.1 Dielectric Performance and System Validation

Table I.1-1: Dielectric Performance of Head Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2022/7/24	Head	750 MHz	44.21	5.41%	0.902	1.35%
2022/7/26	Head	900 MHz	44.15	6.39%	0.927	3.00%
2022/7/20	Head	1900 MHz	41.73	4.32%	1.502	7.29%
2022/7/21	Head	2450 MHz	40.9	4.34%	1.884	4.67%
2022/8/10	Head	2450 MHz	39.77	1.45%	1.9	5.56%

Table I.1-2: System Validation of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value(W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2022/7/24	750 MHz	5.65	8.68	5.88	9.40	4.07%	8.29%
2022/7/26	900 MHz	6.21	9.65	5.84	8.88	-5.96%	-7.98%
2022/7/20	1900 MHz	20.9	40.1	19.4	37.2	-6.99%	-7.33%
2022/7/21	2450 MHz	24.9	53.3	23.6	50.4	-5.38%	-5.44%
2022/8/10	2450 MHz	24.9	53.3	25.1	53.6	0.88%	0.56%

I.2 New frequency band

I.2.1 Conducted power of selected case

Maximum Target Power for Production Unit – Power Level A1/B1/C1

Band	Tune up (dBm)
Band5	24.5
Band 71	24.5

LTE B5

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
1.4MHz	1RB-High (5)	848.3 (20643)	23.27	22.50
		836.5 (20525)	23.29	22.52
		824.7 (20407)	23.29	22.47
	1RB-Middle (3)	848.3 (20643)	23.46	22.69
		836.5 (20525)	23.40	22.54
		824.7 (20407)	23.40	22.58
	1RB-Low (0)	848.3 (20643)	23.28	22.62
		836.5 (20525)	23.27	22.45
		824.7 (20407)	23.27	22.58
	3RB-High (3)	848.3 (20643)	23.41	22.33
		836.5 (20525)	23.37	22.33
		824.7 (20407)	23.37	22.32
	3RB-Middle (1)	848.3 (20643)	23.43	22.38
		836.5 (20525)	23.40	22.34
		824.7 (20407)	23.42	22.38
	3RB-Low (0)	848.3 (20643)	23.41	22.35
		836.5 (20525)	23.38	22.32
		824.7 (20407)	23.39	22.36
	6RB (0)	848.3 (20643)	22.40	21.48
		836.5 (20525)	22.45	21.48
		824.7 (20407)	22.44	21.52
3MHz	1RB-High (14)	847.5 (20635)	23.41	22.52
		836.5 (20525)	23.32	22.59
		825.5 (20415)	23.39	22.66
	1RB-Middle (7)	847.5 (20635)	23.50	22.79
		836.5 (20525)	23.47	22.68
		825.5 (20415)	23.52	22.82
	1RB-Low (0)	847.5 (20635)	23.42	22.70
		836.5 (20525)	23.38	22.54
		825.5 (20415)	23.36	22.70
	8RB-High (7)	847.5 (20635)	22.43	21.49
		836.5 (20525)	22.42	21.45
		825.5 (20415)	22.41	21.45
	8RB-Middle (4)	847.5 (20635)	22.48	21.53
		836.5 (20525)	22.45	21.47
		825.5 (20415)	22.44	21.50
	8RB-Low (0)	847.5 (20635)	22.46	21.51
		836.5 (20525)	22.43	21.44
		825.5 (20415)	22.41	21.49
	15RB (0)	847.5 (20635)	22.44	21.45
		836.5 (20525)	22.44	21.41
		825.5 (20415)	22.41	21.40

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
5MHz	1RB-High (24)	846.5 (20625)	23.32	22.54
		836.5 (20525)	23.24	22.36
		826.5 (20425)	23.30	22.54
	1RB-Middle (12)	846.5 (20625)	23.53	22.78
		836.5 (20525)	23.52	22.62
		826.5 (20425)	23.56	22.80
	1RB-Low (0)	846.5 (20625)	23.29	22.60
		836.5 (20525)	23.30	22.50
		826.5 (20425)	23.30	22.63
	12RB-High (13)	846.5 (20625)	22.43	21.40
		836.5 (20525)	22.43	21.40
		826.5 (20425)	22.47	21.44
	12RB-Middle (6)	846.5 (20625)	22.50	21.49
		836.5 (20525)	22.48	21.42
		826.5 (20425)	22.49	21.46
	12RB-Low (0)	846.5 (20625)	22.48	21.44
		836.5 (20525)	22.42	21.39
		826.5 (20425)	22.40	21.37
	25RB (0)	846.5 (20625)	22.49	21.47
		836.5 (20525)	22.45	21.42
		826.5 (20425)	22.44	21.44
10MHz	1RB-High (49)	844 (20600)	23.39	22.54
		836.5 (20525)	23.39	22.57
		829 (20450)	23.35	22.53
	1RB-Middle (24)	844 (20600)	23.50	22.74
		836.5 (20525)	23.51	22.75
		829 (20450)	23.49	22.75
	1RB-Low (0)	844 (20600)	23.39	22.59
		836.5 (20525)	23.39	22.59
		829 (20450)	23.37	22.59
	25RB-High (25)	844 (20600)	22.50	21.49
		836.5 (20525)	22.57	21.53
		829 (20450)	22.50	21.48
	25RB-Middle (12)	844 (20600)	22.55	21.51
		836.5 (20525)	22.53	21.51
		829 (20450)	22.53	21.53
	25RB-Low (0)	844 (20600)	22.56	21.54
		836.5 (20525)	22.58	21.44
		829 (20450)	22.53	21.50
	50RB (0)	844 (20600)	22.52	21.50
		836.5 (20525)	22.53	21.51
		829 (20450)	22.53	21.52

LTE B71

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
5MHz	1RB-High (24)	695.5 (133447)	23.45	22.74
		680.5 (133297)	23.41	22.67
		665.5 (133147)	23.39	22.68
	1RB-Middle (12)	695.5 (133447)	23.69	22.99
		680.5 (133297)	23.67	22.84
		665.5 (133147)	23.66	22.95
	1RB-Low (0)	695.5 (133447)	23.45	22.72
		680.5 (133297)	23.42	22.60
		665.5 (133147)	23.43	22.59
	12RB-High (13)	695.5 (133447)	22.63	21.57
		680.5 (133297)	22.54	21.53
		665.5 (133147)	22.53	21.52
	12RB-Middle (6)	695.5 (133447)	22.65	21.60
		680.5 (133297)	22.60	21.60
		665.5 (133147)	22.62	21.61
	12RB-Low (0)	695.5 (133447)	22.61	21.59
		680.5 (133297)	22.57	21.59
		665.5 (133147)	22.59	21.58
	25RB (0)	695.5 (133447)	22.65	21.62
		680.5 (133297)	22.57	21.58
		665.5 (133147)	22.57	21.59
10MHz	1RB-High (49)	693 (132422)	23.69	22.95
		680.5 (133297)	23.52	22.78
		668 (133172)	23.53	22.83
	1RB-Middle (24)	693 (132422)	23.82	23.07
		680.5 (133297)	23.64	22.73
		668 (133172)	23.61	22.90
	1RB-Low (0)	693 (132422)	23.67	22.94
		680.5 (133297)	23.55	22.74
		668 (133172)	23.57	22.76
	25RB-High (25)	693 (132422)	22.83	21.86
		680.5 (133297)	22.61	21.59
		668 (133172)	22.72	21.77
	25RB-Middle (12)	693 (132422)	22.82	21.82
		680.5 (133297)	22.60	21.61
		668 (133172)	22.59	21.64
	25RB-Low (0)	693 (132422)	22.84	21.85
		680.5 (133297)	22.69	21.70
		668 (133172)	22.70	21.70
	50RB (0)	693 (132422)	22.84	21.86
		680.5 (133297)	22.66	21.66
		668 (133172)	22.74	21.74

BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
15MHz	1RB-High (74)	690.5 (133397)	23.53	22.74
		680.5 (133297)	23.45	22.71
		670.5 (133197)	23.45	22.67
	1RB-Middle (37)	690.5 (133397)	23.57	22.81
		680.5 (133297)	23.55	22.79
		670.5 (133197)	23.58	22.86
	1RB-Low (0)	690.5 (133397)	23.49	22.68
		680.5 (133297)	23.52	22.82
		670.5 (133197)	23.49	22.69
	36RB-High (38)	690.5 (133397)	22.65	21.59
		680.5 (133297)	22.60	21.59
		670.5 (133197)	22.68	21.64
	36RB-Middle (19)	690.5 (133397)	22.64	21.59
		680.5 (133297)	22.62	21.60
		670.5 (133197)	22.66	21.63
	36RB-Low (0)	690.5 (133397)	22.64	21.60
		680.5 (133297)	22.67	21.64
		670.5 (133197)	22.67	21.64
	75RB (0)	690.5 (133397)	22.64	21.60
		680.5 (133297)	22.64	21.65
		670.5 (133197)	22.67	21.66
20MHz	1RB-High (99)	688 (133372)	23.35	22.58
		683 (133322)	23.29	22.57
		673 (133222)	23.27	22.55
	1RB-Middle (50)	688 (133372)	23.62	22.80
		683 (133322)	23.72	22.83
		673 (133222)	23.69	22.96
	1RB-Low (0)	688 (133372)	23.37	22.64
		683 (133322)	23.41	22.64
		673 (133222)	23.35	22.51
	50RB-High (50)	688 (133372)	22.62	21.57
		683 (133322)	22.63	21.65
		673 (133222)	22.56	21.55
	50RB-Middle (25)	688 (133372)	22.62	21.63
		683 (133322)	22.65	21.66
		673 (133222)	22.65	21.66
	50RB-Low (0)	688 (133372)	22.74	21.72
		683 (133322)	22.78	21.80
		673 (133222)	22.63	21.66
	100RB (0)	688 (133372)	22.65	21.61
		683 (133322)	22.72	21.74
		673 (133222)	22.58	21.59

I.2.2 SAR Test Result

Test Position	Phantom position L/R/F	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No.	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Cheek	L	LTE Band5	20525	836.5	1RB-Middle	FIG I.1	23.51	24.5	0.401	0.50	0.307	**0.39**	0.06
Tilt	L	LTE Band5	20525	836.5	1RB-Middle	\	23.51	24.5	0.302	**0.38**	0.235	**0.30**	-0.18
Cheek	R	LTE Band5	20525	836.5	1RB-Middle	\	23.51	24.5	0.286	**0.36**	0.225	**0.28**	0.09
Tilt	R	LTE Band5	20525	836.5	1RB-Middle	\	23.51	24.5	0.227	**0.29**	0.176	**0.22**	-0.01
Cheek	L	LTE Band5	20525	836.5	25RB-Mid	\	22.58	23.5	0.305	**0.38**	0.234	**0.29**	0.17
Tilt	L	LTE Band5	20525	836.5	25RB-Mid	\	22.58	23.5	0.237	**0.29**	0.183	**0.23**	-0.05
Cheek	R	LTE Band5	20525	836.5	25RB-Mid	\	22.58	23.5	0.203	**0.25**	0.157	**0.19**	0.07
Tilt	R	LTE Band5	20525	836.5	25RB-Mid	\	22.58	23.5	0.175	**0.22**	0.135	**0.17**	-0.13
Body	F	LTE Band5	20525	836.5	1RB-Middle Front 10mm	\	23.51	24.5	0.327	**0.41**	0.180	**0.23**	0.06
Body	F	LTE Band5	20525	836.5	1RB-Middle Rear 10mm	FIG I.2	23.51	24.5	0.467	0.59	0.258	**0.32**	0.19
Body	F	LTE Band5	20525	836.5	1RB-Middle Left Edge 10mm	\	23.51	24.5	0.169	**0.21**	0.085	**0.11**	0.16
Body	F	LTE Band5	20525	836.5	1RB-Middle Right Edge 10mm	\	23.51	24.5	0.200	**0.25**	0.101	**0.13**	-0.09
Body	F	LTE Band5	20525	836.5	1RB-Middle Bottom Edge 10mm	\	23.51	24.5	0.267	**0.34**	0.115	**0.14**	-0.19
Body	F	LTE Band5	20525	836.5	25RB-Mid Front 10mm	\	22.58	23.5	0.246	**0.30**	0.136	**0.17**	-0.06
Body	F	LTE Band5	20525	836.5	25RB-Mid Rear 10mm	\	22.58	23.5	0.340	**0.42**	0.143	**0.18**	-0.09
Body	F	LTE Band5	20525	836.5	25RB-Mid Left Edge 10mm	\	22.58	23.5	0.050	**0.06**	0.026	**0.03**	-0.12
Body	F	LTE Band5	20525	836.5	25RB-Mid Right Edge 10mm	\	22.58	23.5	0.041	**0.05**	0.021	**0.03**	-0.05
Body	F	LTE Band5	20525	836.5	25RB-Mid Bottom Edge 10mm	\	22.58	23.5	0.166	**0.21**	0.071	**0.09**	-0.03
Cheek	L	LTE Band71	133322	683	1RB-Middle	FIG I.3	23.72	24.5	0.175	0.21	0.128	**0.15**	0.07
Tilt	L	LTE Band71	133322	683	1RB-Middle	\	23.72	24.5	0.119	**0.14**	0.093	**0.11**	0.07
Cheek	R	LTE Band71	133322	683	1RB-Middle	\	23.72	24.5	0.166	**0.20**	0.129	**0.15**	-0.11
Tilt	R	LTE Band71	133322	683	1RB-Middle	\	23.72	24.5	0.122	**0.15**	0.097	**0.12**	-0.14
Cheek	L	LTE Band71	133322	683	50RB-Middle	\	22.78	23.5	0.135	**0.16**	0.105	**0.12**	0.02
Tilt	L	LTE Band71	133322	683	50RB-Middle	\	22.78	23.5	0.094	**0.11**	0.075	**0.09**	-0.16
Cheek	R	LTE Band71	133322	683	50RB-Middle	\	22.78	23.5	0.129	**0.15**	0.101	**0.12**	0.11
Tilt	R	LTE Band71	133322	683	50RB-Middle	\	22.78	23.5	0.100	**0.12**	0.077	**0.09**	0.13
Body	F	LTE Band71	133322	683	1RB-Middle Front 10mm	\	23.72	24.5	0.205	**0.25**	0.157	**0.19**	0.18
Body	F	LTE Band71	133322	683	1RB-Middle Rear 10mm	FIG I.4	23.72	24.5	0.319	0.38	0.243	**0.29**	0.10
Body	F	LTE Band71	133322	683	1RB-Middle Left Edge 10mm	\	23.72	24.5	0.056	**0.07**	0.038	**0.05**	-0.08
Body	F	LTE Band71	133322	683	1RB-Middle Right Edge 10mm	\	23.72	24.5	0.179	**0.21**	0.128	**0.15**	0.17
Body	F	LTE Band71	133322	683	1RB-Middle Bottom Edge 10mm	\	23.72	24.5	0.086	**0.10**	0.052	**0.06**	0.02
Body	F	LTE Band71	133322	683	50RB-Middle Front 10mm	\	22.78	23.5	0.160	**0.19**	0.123	**0.15**	-0.04
Body	F	LTE Band71	133322	683	50RB-Middle Rear 10mm	\	22.78	23.5	0.246	**0.29**	0.189	**0.22**	0.01
Body	F	LTE Band71	133322	683	50RB-Middle Left Edge 10mm	\	22.78	23.5	0.204	**0.24**	0.145	**0.17**	0.18
Body	F	LTE Band71	133322	683	50RB-Middle Right Edge 10mm	\	22.78	23.5	0.139	**0.16**	0.100	**0.12**	0.18
Body	F	LTE Band71	133322	683	50RB-Middle Bottom Edge 10mm	\	22.78	23.5	0.066	**0.08**	0.040	**0.05**	-0.06

Test Position	Phantom position L/R/F	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No.	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Cheek	L	BT	39	2480		\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\
Tilt	L	BT	39	2480		\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\
Cheek	R	BT	39	2480		\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\
Tilt	R	BT	39	2480		FIG I.5	8.14	9.8	0.0639	**0.09**	0.0264	**0.04**	0.15
Body	F	BT	39	2480	Front 10mm	\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\
Body	F	BT	39	2480	Rear 10mm	FIG I.6	8.14	9.8	0.0422	**0.06**	0.0195	**0.03**	0.16
Body	F	BT	39	2480	Left Edge 10mm	\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\
Body	F	BT	39	2480	Right Edge 10mm	\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\
Body	F	BT	39	2480	Bottom Edge 10mm	\	8.14	9.8	<0.01	<0.01	<0.01	<0.01	\

I.3 Spot Check

I.3.1 Measurement results

Test Position	Phantom position L/R/F	Frequency Band	Channel Number	Frequency (MHz)	Test setup	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Tilt	R	WIFI	11	2462		16.38	17	0.704	0.81	0.287	**0.33**	0.05
Body	F	GSM1900	512	1850.2	Bottom Edge GPRS 10mm	27.22	28	0.877	1.05	0.467	**0.56**	0.04

I.3.2 Reported SAR Comparison

Table I.3.3-1: Highest Reported SAR (1g)

Technology Band	Highest Reported SAR (1g)					
	Head Original	Head Spot check	Hotspot Original	Hotspot Spot check	Body-Worn Original	Body-Worn Spot check
GSM850	**0.47**	/	**0.61**	/	**0.61**	/
GSM1900	**0.25**	/	**1.13**	**1.05**	**1.05**	/
WCDMA1900	**0.30**	/	**1.02**	/	**0.62**	/
WCDMA 1700	**0.31**	/	**0.93**	/	**0.70**	/
WCDMA 850	**0.51**	/	**0.60**	/	**0.60**	/

LTE Band2	**0.25**	/	**0.70**	/	**0.68**	/
LTE Band7	**0.08**	/	**1.08**	/	**0.59**	/
LTE Band12	**0.20**	/	**0.25**	/	**0.25**	/
LTE Band13	**0.35**	/	**0.49**	/	**0.49**	/
LTE Band26	**0.37**	/	**0.52**	/	**0.52**	/
LTE Band66	**0.43**	/	**0.90**	/	**0.41**	/
WLAN 2.4GHz	**0.81**	**0.81**	**0.43**	/	**0.56**	/

Note: The spot check results marked by blue are larger than the original result. So they replace the original result and others are shared.

I.4 List of Main Instruments

Table I.4-1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 4, 2022	One year
02	Power sensor	NRP110T	101139	January 13, 2022	One year
03	Power sensor	NRP110T	101159		
04	Signal Generator	E4438C	MY49071430	January 13, 2022	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	159890	January 24, 2022	One year
08	DAE	SPEAG DAE4	1525	September 01, 2021	One year
09	E-field Probe	SPEAG EX3DV4	7517	January 19, 2022	One year
10	Dipole Validation Kit	SPEAG D750V2	1017	July 12,2021	Three year
11	Dipole Validation Kit	SPEAG D835V2	4d092	July 5,2022	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d142	July 6,2022	One year
13	Dipole Validation Kit	SPEAG D2450V2	853	July 26,2021	Three year

I.5 GRAPH RESULTS

LTE_B5_Head

Date: 7/26/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.928 S/m; εr = 44.161; ρ = 1000 kg/m3

Ambient Temperature:23.3oC Liquid Temperature: 22.5oC

Communication System: UID 0, LTE Band5 (0) Frequency: 836.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(9.7, 9.7, 9.7)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.484 W/kg

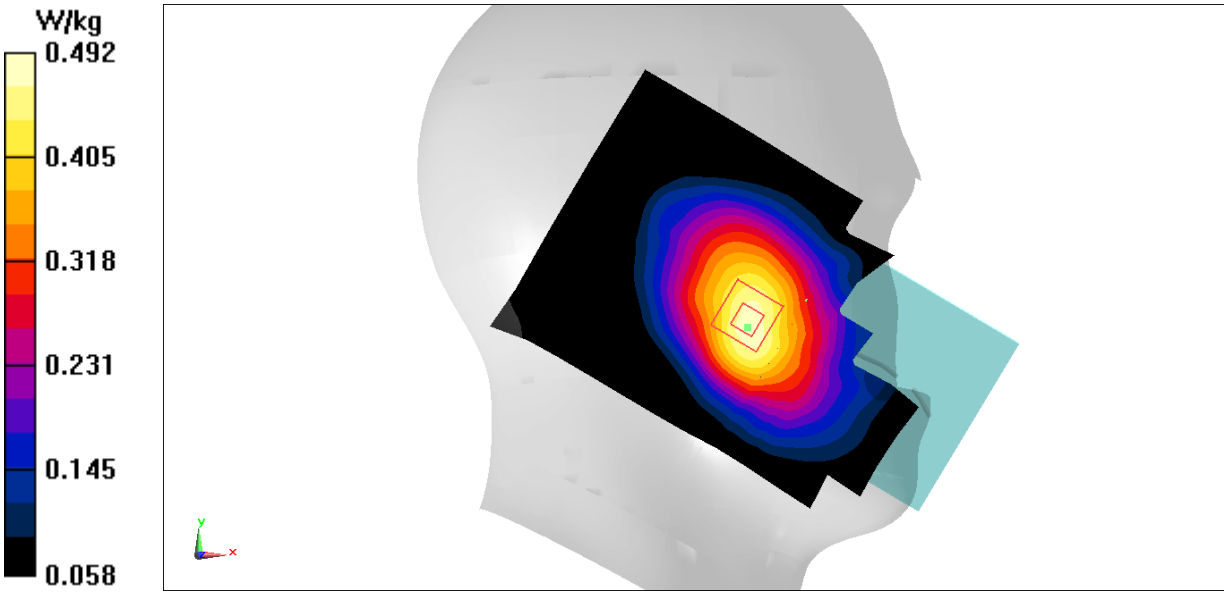
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.818 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.544 W/kg

SAR(1 g) = 0.401 W/kg; SAR(10 g) = 0.307 W/kg

Maximum value of SAR (measured) = 0.492 W/kg



LTE_B5_Body

Date: 7/26/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.928 S/m; εr = 44.161; ρ = 1000 kg/m3

Ambient Temperature:23.3oC Liquid Temperature: 22.5oC

Communication System: UID 0, LTE Band5 (0) Frequency: 836.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(9.7, 9.7, 9.7)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.734 W/kg

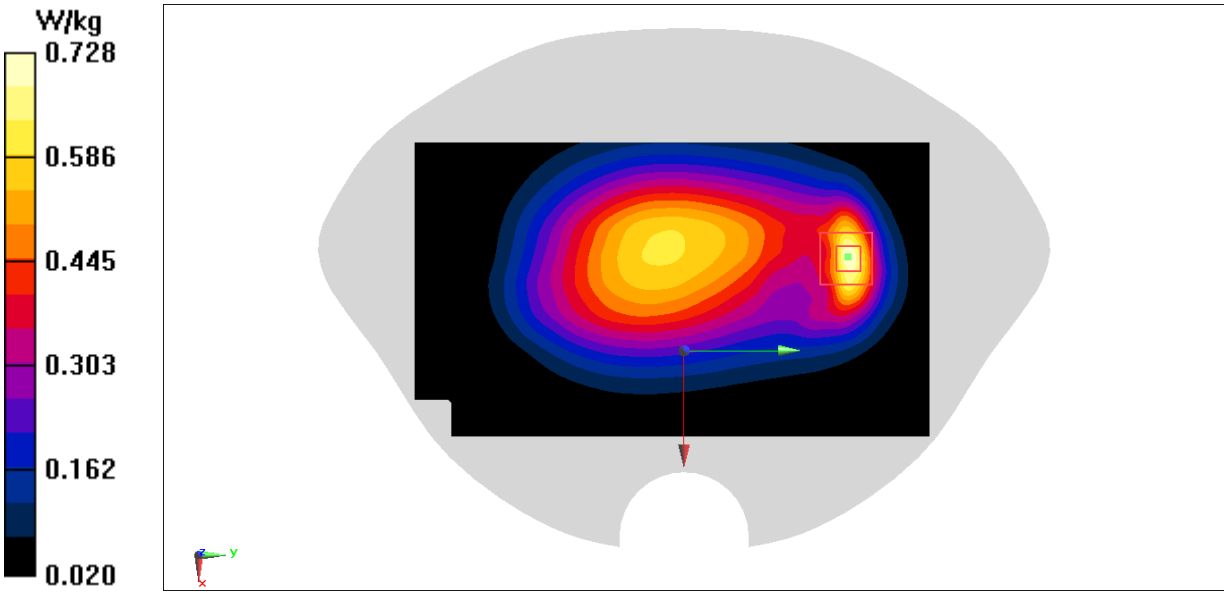
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.88 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.918 W/kg

SAR(1 g) = 0.467 W/kg; SAR(10 g) = 0.258 W/kg

Maximum value of SAR (measured) = 0.728 W/kg



LTE_B71_Head

Date: 7/24/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used (extrapolated): f = 683 MHz; σ = 0.864 S/m; εr = 44.663; ρ = 1000 kg/m3

Ambient Temperature:23.3oC Liquid Temperature: 22.5oC

Communication System: UID 0, LTE Band71 (0) Frequency: 683 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(9.7, 9.7, 9.7)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.207 W/kg

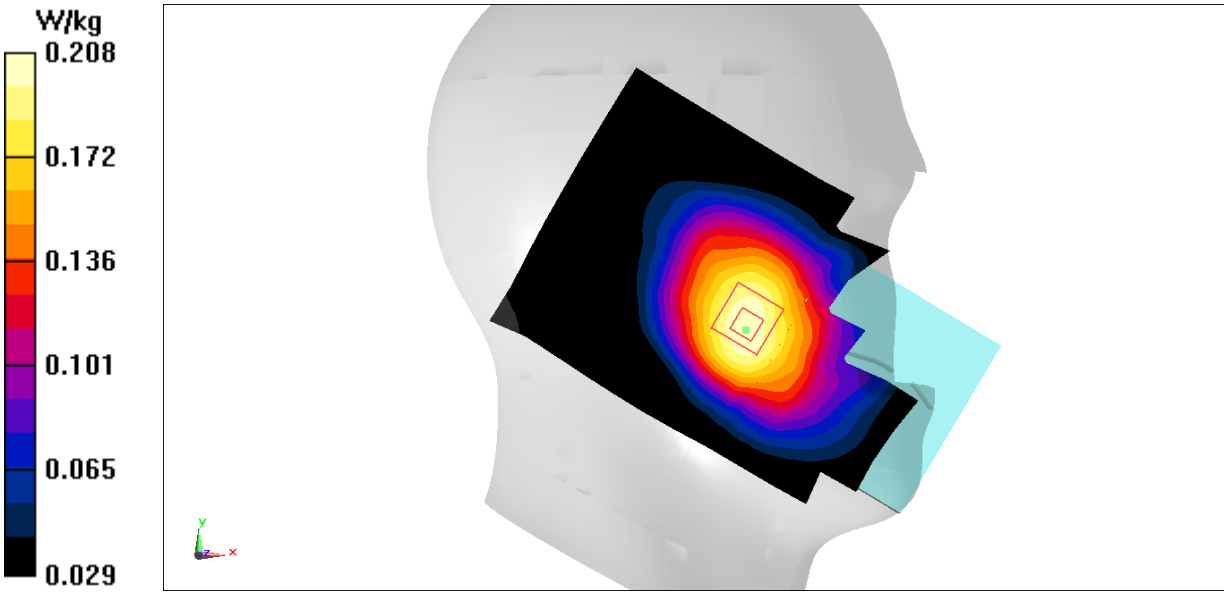
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.648 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.227 W/kg

SAR(1 g) = 0.175 W/kg; SAR(10 g) = 0.138 W/kg

Maximum value of SAR (measured) = 0.208 W/kg



LTE_B71_Body

Date: 7/24/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used (extrapolated): f = 683 MHz; σ = 0.864 S/m; εr = 44.663; ρ = 1000 kg/m3

Ambient Temperature:23.3oC Liquid Temperature: 22.5oC

Communication System: UID 0, LTE Band71 (0) Frequency: 683 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(9.7, 9.7, 9.7)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

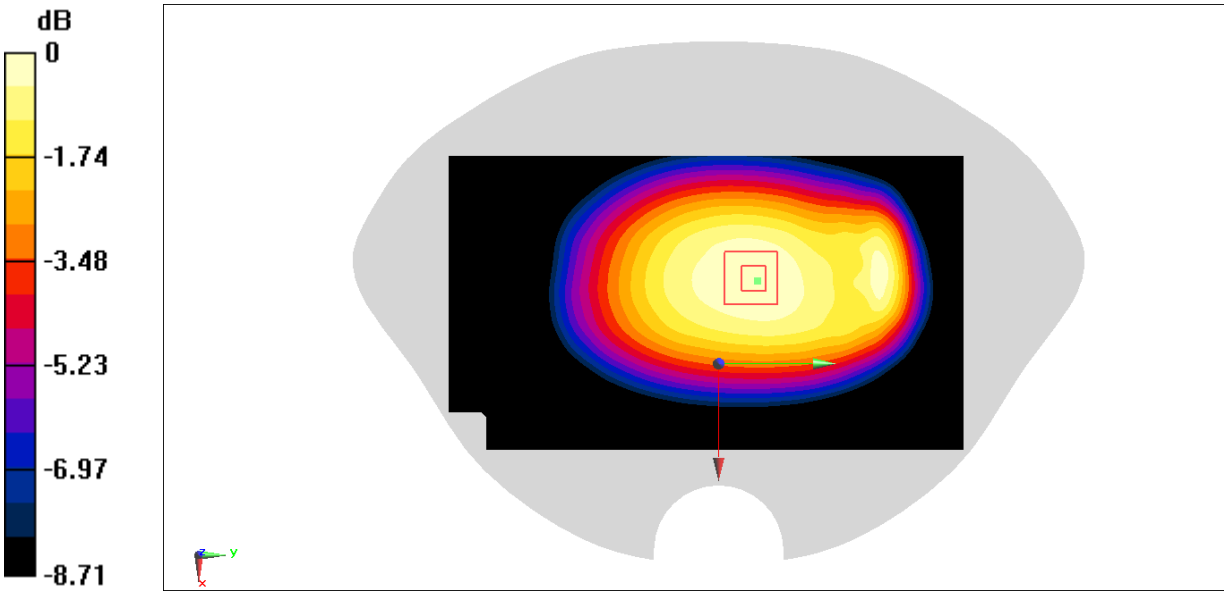
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.47 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.436 W/kg

SAR(1 g) = 0.319 W/kg; SAR(10 g) = 0.243 W/kg

Maximum value of SAR (measured) = 0.392 W/kg



0 dB = 0.392 W/kg = -4.07 dBW/kg

WIFI2450_Head

Date: 7/21/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used (interpolated): f = 2462 MHz; σ = 1.891 S/m; εr = 40.89; ρ = 1000 kg/m3

Ambient Temperature:23.3oC Liquid Temperature: 22.5oC

Communication System: UID 0, WLan 2450 (0) Frequency: 2462 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(7.16, 7.16, 7.16)

Area Scan (101x181x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.974 W/kg

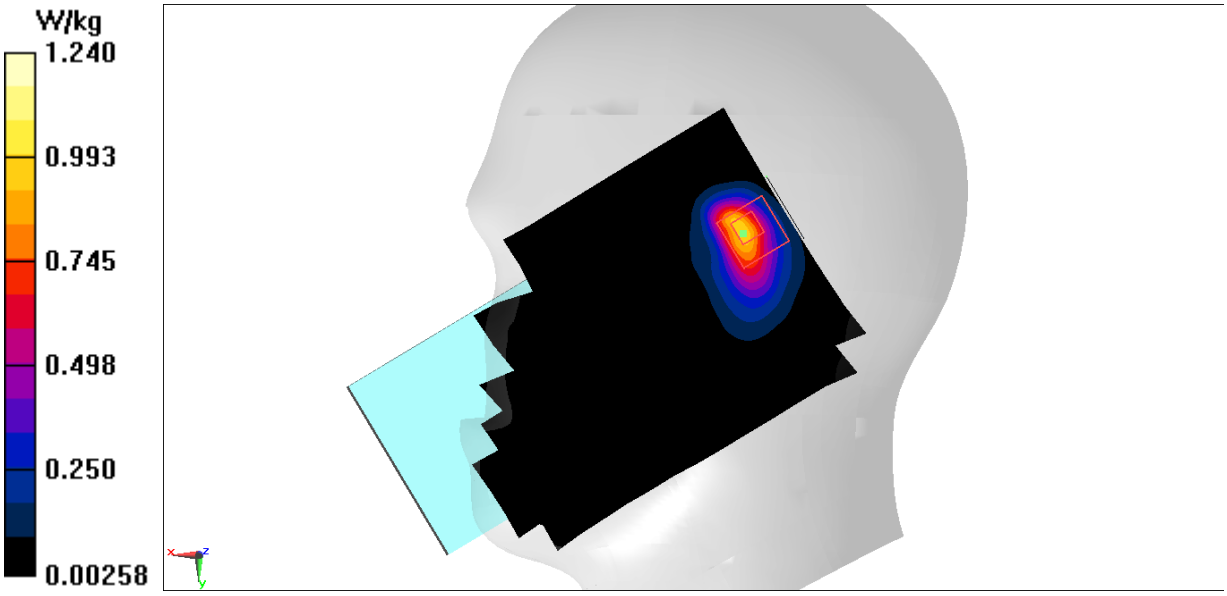
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.37 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.704 W/kg; SAR(10 g) = 0.287 W/kg

Maximum value of SAR (measured) = 1.24 W/kg



GSM1900_Body

Date: 7/20/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.472 S/m; εr = 41.8; ρ = 1000 kg/m3

Ambient Temperature:23.3oC Liquid Temperature: 22.5oC

Communication System: UID 0, GSM 1900 GPRS-2 (0) Frequency: 1850.2 MHz Duty Cycle: 1:4.00037

Probe: EX3DV4 - SN7517 ConvF(7.74, 7.74, 7.74)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.28 W/kg

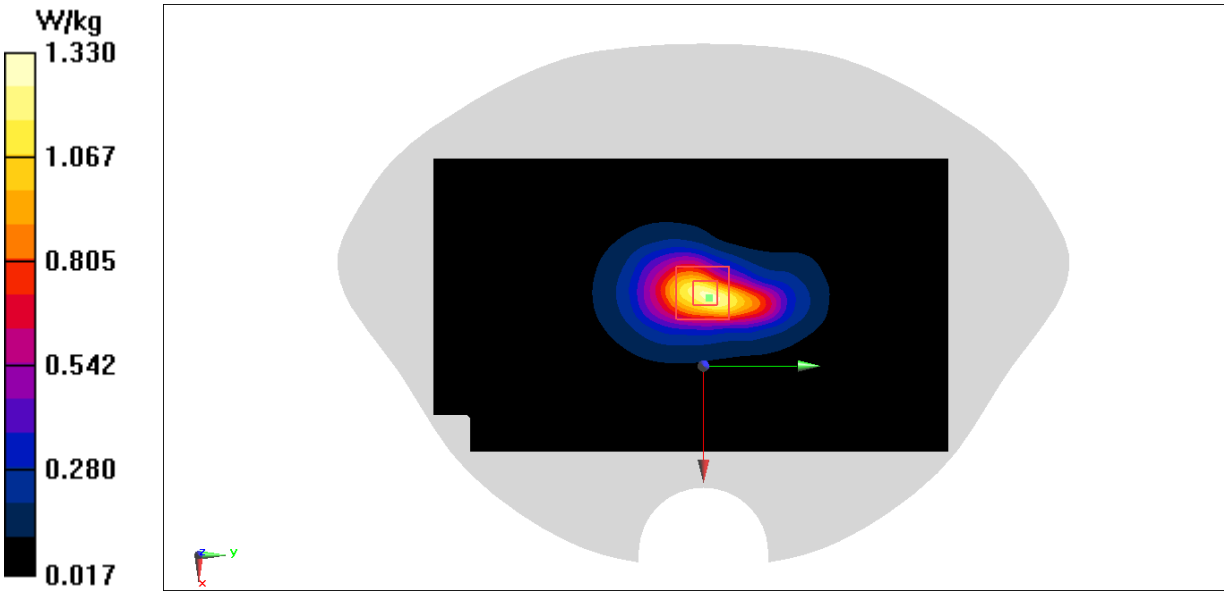
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.25 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.877 W/kg; SAR(10 g) = 0.467 W/kg

Maximum value of SAR (measured) = 1.33 W/kg



BT_Head

Date: 8/10/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used: f = 2480 MHz; σ = 1.923 S/m; ε_r = 39.732; ρ = 1000 kg/m^3

Ambient Temperature:23.3°C Liquid Temperature: 22.5°C

Communication System: UID 0, Bluetooth (0) Frequency: 2480 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(7.16, 7.16, 7.16); Calibrated: 1/19/2022

Area Scan (101x181x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.112 W/kg

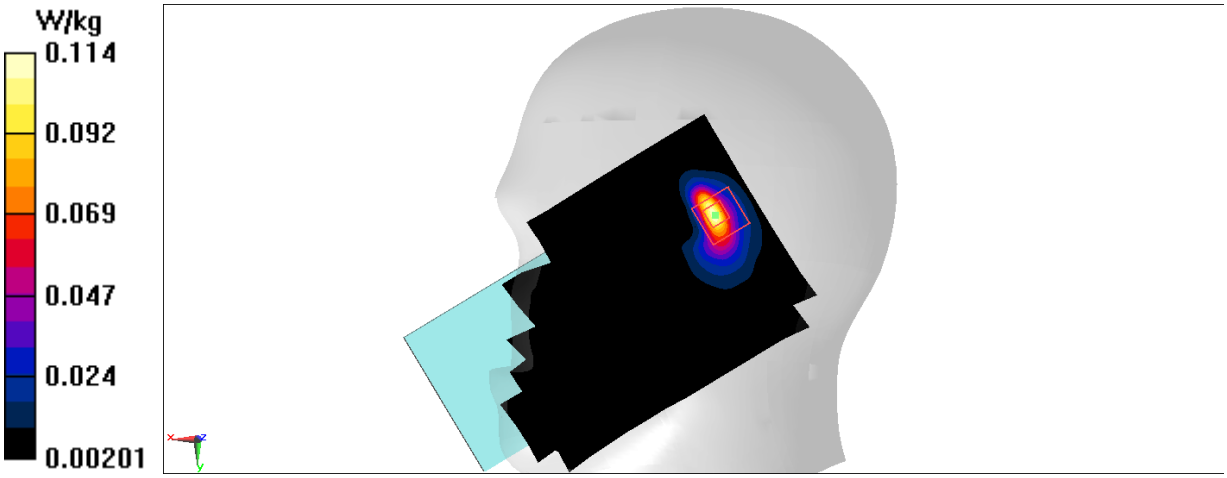
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.990 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.147 W/kg

SAR(1 g) = 0.064 W/kg; SAR(10 g) = 0.026 W/kg

Maximum value of SAR (measured) = 0.114 W/kg



BT_Body

Date: 8/10/2022

Electronics: DAE4 Sn1525

Medium: H700-6000M

Medium parameters used: f = 2480 MHz; σ = 1.923 S/m; ε_r = 39.732; ρ = 1000 kg/m^3

Ambient Temperature:23.3°C Liquid Temperature: 22.5°C

Communication System: UID 0, Bluetooth (0) Frequency: 2480 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7517 ConvF(7.16, 7.16, 7.16); Calibrated: 1/19/2022

Area Scan (101x181x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0719 W/kg

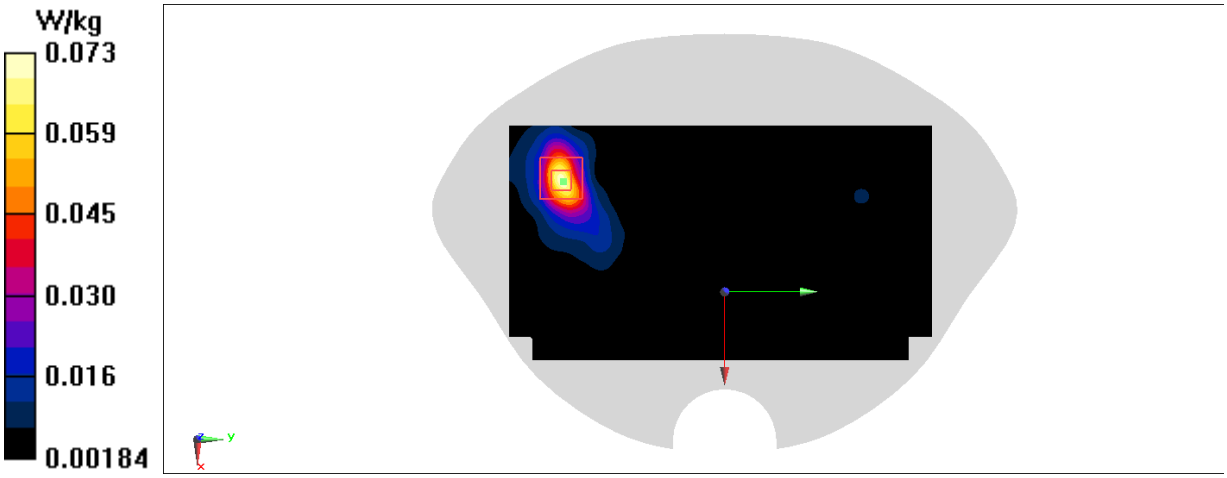
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.6950 V/m; Power Drift =0.06dB

Peak SAR (extrapolated) = 0.0920 W/kg

SAR(1 g) = 0.043 W/kg; SAR(10 g) = 0.020 W/kg

Maximum value of SAR (measured) = 0.0733 W/kg



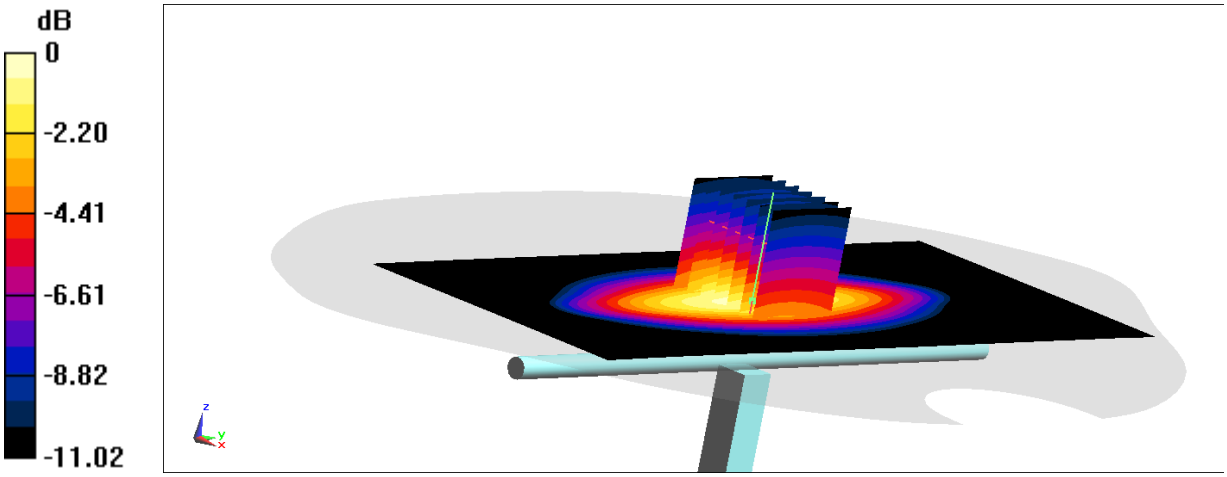
I.6 System Validation

750MHz

Date/Time: 7/24/2022
Electronics: DAE4 Sn1525
Medium: H700-6000M
Medium parameters used: f = 750 MHz; σ = 0.902 S/m; εr = 44.214; ρ = 1000 kg/m3
Ambient Temperature:23.3oC Liquid Temperature: 22.5oC
Communication System: UID 0, CW (0) Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7517 ConvF(9.7, 9.7, 9.7)

Area Scan (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.88 W/kg

Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.99 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 3.78 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.47 W/kg
Maximum value of SAR (measured) = 3.10 W/kg



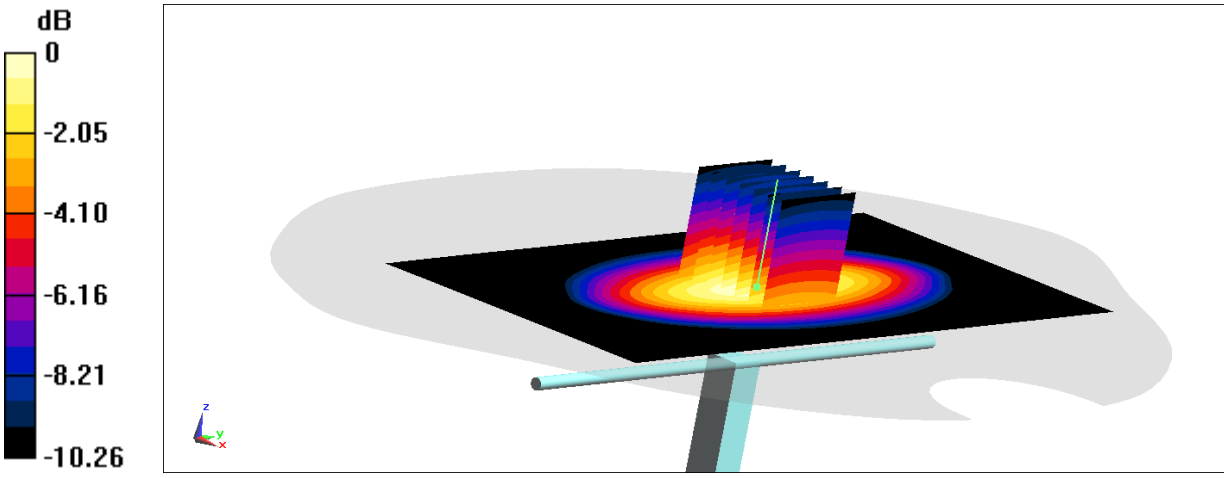
0 dB = 3.10 W/kg = 4.91 dBW/kg

835MHz

Date/Time: 7/26/2022
Electronics: DAE4 Sn1525
Medium: H700-6000M
Medium parameters used: f = 835 MHz; σ = 0.927 S/m; εr = 44.149; ρ = 1000 kg/m3
Ambient Temperature:23.3oC Liquid Temperature: 22.5oC
Communication System: UID 0, CW (0) Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7517 ConvF(9.7, 9.7, 9.7)

Area Scan (61x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.75 W/kg

Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.77 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.22 W/kg; SAR(10 g) = 1.46 W/kg
Maximum value of SAR (measured) = 2.81 W/kg



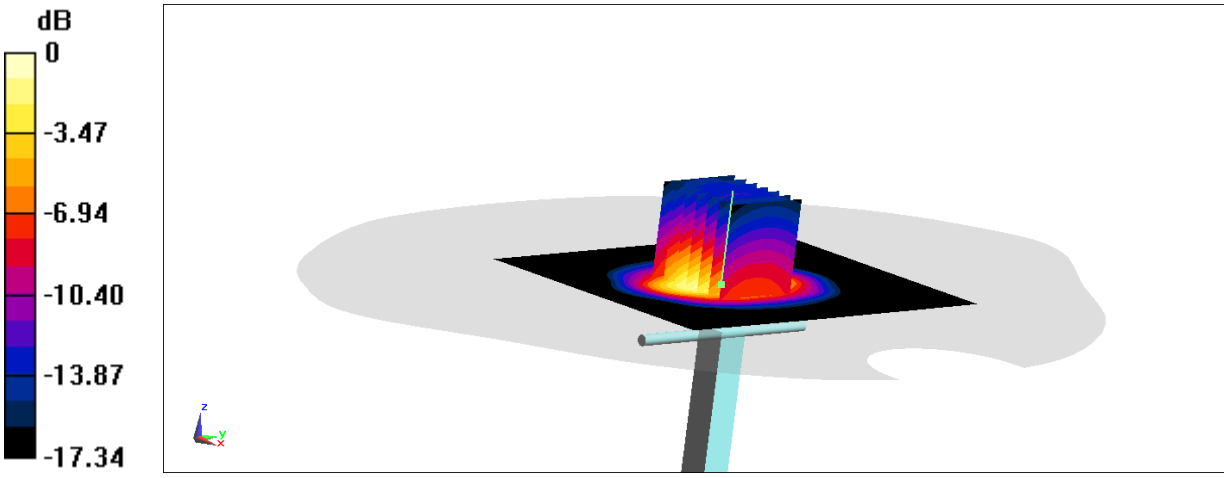
0 dB = 2.81 W/kg = 4.49 dBW/kg

1900MHz

Date/Time: 7/20/2022
Electronics: DAE4 Sn1525
Medium: H700-6000M
Medium parameters used: f = 1900 MHz; σ = 1.502 S/m; εr = 41.728; ρ = 1000 kg/m3
Ambient Temperature:23.3oC Liquid Temperature: 22.5oC
Communication System: UID 0, CW (0) Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7517 ConvF(7.74, 7.74, 7.74)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 13.8 W/kg

Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.00 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.29 W/kg; SAR(10 g) = 4.86 W/kg
Maximum value of SAR (measured) = 13.2 W/kg



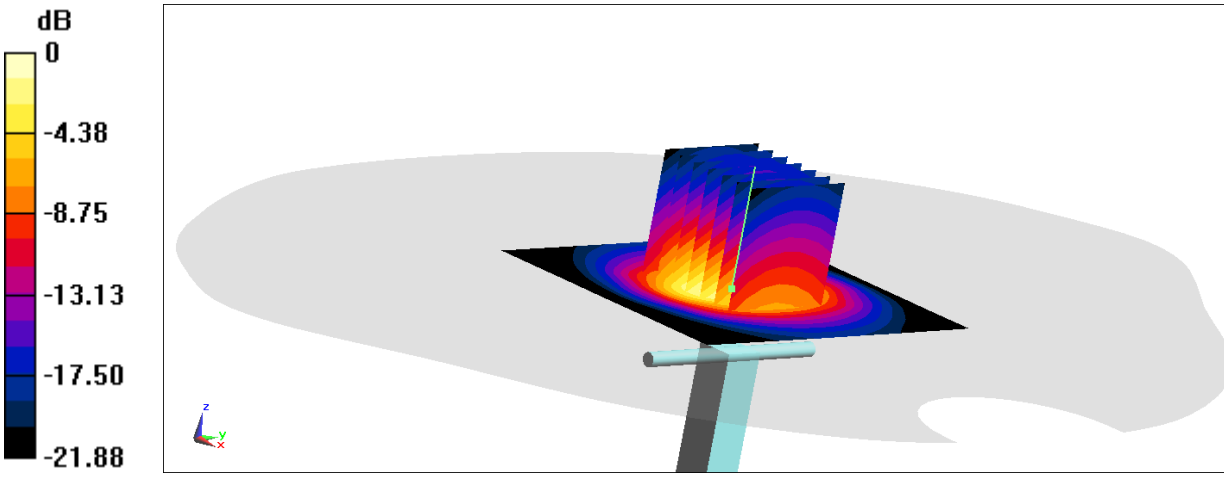
0 dB = 13.2 W/kg = 11.21 dBW/kg

2450MHz

Date/Time: 7/21/2022
Electronics: DAE4 Sn1525
Medium: H700-6000M
Medium parameters used: f = 2450 MHz; σ = 1.884 S/m; εr = 40.902; ρ = 1000 kg/m3
Ambient Temperature:23.3oC Liquid Temperature: 22.5oC
Communication System: UID 0, CW (0) Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7517 ConvF(7.16, 7.16, 7.16)

Area Scan (61x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.6 W/kg

Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.9 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 25.4 W/kg
SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.89 W/kg
Maximum value of SAR (measured) = 19.0 W/kg



0 dB = 19.0 W/kg = 12.79 dBW/kg

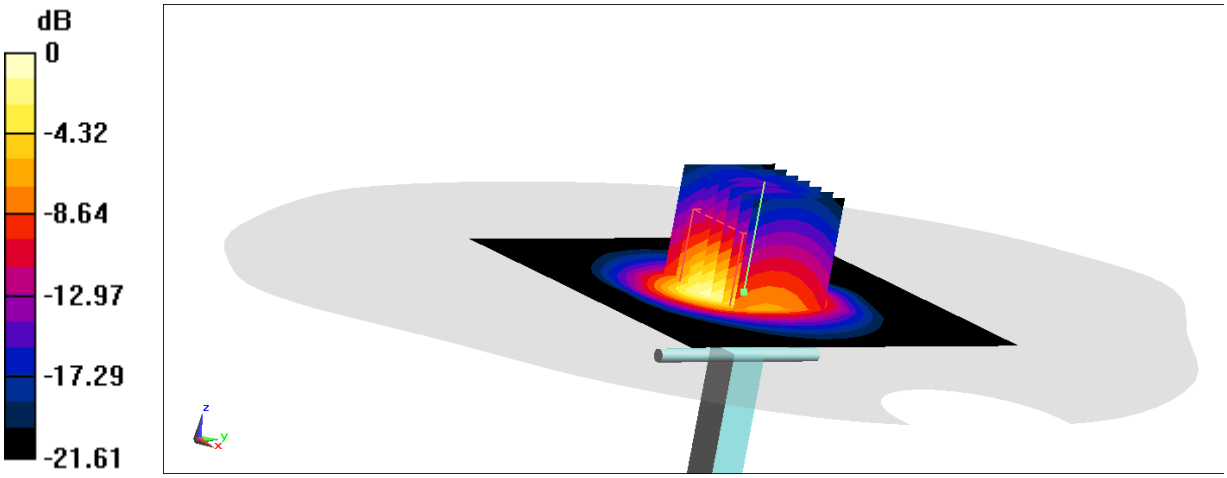
2450MHz

Date/Time: 8/10/2022
Electronics: DAE4 Sn1525
Medium: H700-6000M
Medium parameters used: f = 2450 MHz; σ = 1.9 S/m; ε_r = 39.773; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: UID 0, CW (0) Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7517 ConvF(7.16, 7.16, 7.16); Calibrated: 1/19/2022

Area Scan (81x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 21.0 W/kg

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

Reference Value = 104.3 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 26.6 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.28 W/kg
Maximum value of SAR (measured) = 19.8 W/kg



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

I.7 Probe Calibration Certificate

Probe 7517 Calibration Certificate

In Collaboration with
CALIBRATION LABORATORY
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

CALIBRATION
CNAS L0570

Client CTTL Certificate No: Z21-60558

CALIBRATION CERTIFICATE

Object EX3DV4 - SN : 7517

Calibration Procedure(s) FF-Z11-004-02
Calibration Procedures for Dosimetric E-field Probes

Calibration date: January 19, 2022

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101547	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101548	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Reference 10dBAttenuator	18N50W-10dB	10-Feb-20(CTTL, No.J20X00525)	Feb-22
Reference 20dBAttenuator	18N50W-20dB	10-Feb-20(CTTL, No.J20X00526)	Feb-22
Reference Probe EX3DV4	SN 3617	27-Jan-21(SPEAG, No.EX3-3617_Jan21)	Jan-22
DAE4	SN 1555	20-Aug-21(SPEAG, No.DAE4-1555_Aug21/2)	Aug-22

Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	16-Jun-21(CTTL, No.J21X04467)	Jun-22
Network Analyzer E5071C	MY46110673	14-Jan-22 (CTTL, No.J22X00406)	Jan -23

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: January 21, 2022

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

Certificate No: Z21-60558 Page 1 of 10

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016

c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z:* A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

DASY/EASY – Parameters of Probe: EX3DV4 – SN:7517

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (*k*=2)
Norm(μV/(V/m)²)[A]	0.49	0.51	0.55	±10.0%
DCP(mV)[B]	101.9	101.5	100.9	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (*k*=2)
0	CW	X	0.0	0.0	1.0	0.00	168.0	±3.0%
		Y	0.0	0.0	1.0		172.3	
		Z	0.0	0.0	1.0		178.0	

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

[A] The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4 and Page 5).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

DASY/EASY – Parameters of Probe: EX3DV4 – SN:7517

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (*k*=2)
750	41.9	0.89	9.70	9.70	9.70	0.15	1.32	±12.1%
900	41.5	0.97	9.30	9.30	9.30	0.21	1.19	±12.1%
1450	40.5	1.20	8.40	8.40	8.40	0.18	1.06	±12.1%
1640	40.3	1.29	8.20	8.20	8.20	0.30	0.90	±12.1%
1750	40.1	1.37	8.10	8.10	8.10	0.25	0.93	±12.1%
1900	40.0	1.40	7.74	7.74	7.74	0.30	0.90	±12.1%
2100	39.8	1.49	7.64	7.64	7.64	0.24	1.09	±12.1%
2300	39.5	1.67	7.44	7.44	7.44	0.64	0.68	±12.1%
2450	39.2	1.80	7.16	7.16	7.16	0.43	0.91	±12.1%
2600	39.0	1.96	6.97	6.97	6.97	0.57	0.77	±12.1%
3300	38.2	2.71	6.85	6.85	6.85	0.45	0.92	±13.3%
3500	37.9	2.91	6.60	6.60	6.60	0.40	1.03	±13.3%
3700	37.7	3.12	6.34	6.34	6.34	0.41	1.03	±13.3%
3900	37.5	3.32	6.25	6.25	6.25	0.35	1.35	±13.3%
4100	37.2	3.53	6.34	6.34	6.34	0.40	1.15	±13.3%
4200	37.1	3.63	6.26	6.26	6.26	0.35	1.35	±13.3%
4400	36.9	3.84	6.15	6.15	6.15	0.35	1.35	±13.3%
4600	36.7	4.04	6.05	6.05	6.05	0.50	1.13	±13.3%
4800	36.4	4.25	6.01	6.01	6.01	0.50	1.13	±13.3%
4950	36.3	4.40	5.74	5.74	5.74	0.45	1.25	±13.3%
5250	35.9	4.71	5.30	5.30	5.30	0.50	1.25	±13.3%
5600	35.5	5.07	4.70	4.70	4.70	0.55	1.20	±13.3%
5750	35.4	5.22	4.75	4.75	4.75	0.55	1.20	±13.3%

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

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

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

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

DASY/EASY – Parameters of Probe: EX3DV4 – SN:7517

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (*k*=2)
750	55.5	0.96	9.65	9.65	9.65	0.40	0.85	±12.1%
900	55.0	1.05	9.20	9.20	9.20	0.24	1.18	±12.1%
1450	54.0	1.30	8.20	8.20	8.20	0.14	1.34	±12.1%
1640	53.8	1.40	8.05	8.05	8.05	0.25	1.08	±12.1%
1750	53.4	1.49	7.85	7.85	7.85	0.32	0.98	±12.1%
1900	53.3	1.52	7.58	7.58	7.58	0.24	1.13	±12.1%
2100	53.2	1.62	7.47	7.47	7.47	0.25	1.19	±12.1%
2300	52.9	1.81	7.35	7.35	7.35	0.44	0.93	±12.1%
2450	52.7	1.95	7.21	7.21	7.21	0.50	0.84	±12.1%
2600	52.5	2.16	7.02	7.02	7.02	0.68	0.70	±12.1%
3300	51.6	3.08	6.25	6.25	6.25	0.43	1.11	±13.3%
3500	51.3	3.31	6.06	6.06	6.06	0.40	1.25	±13.3%
3700	51.0	3.55	5.99	5.99	5.99	0.40	1.25	±13.3%
3900	51.2	3.78	5.95	5.95	5.95	0.40	1.30	±13.3%
4100	50.5	4.01	5.90	5.90	5.90	0.40	1.30	±13.3%
4200	50.4	4.13	5.80	5.80	5.80	0.45	1.30	±13.3%
4400	50.1	4.37	5.70	5.70	5.70	0.45	1.30	±13.3%
4600	49.8	4.60	5.58	5.58	5.58	0.50	1.25	±13.3%
4800	49.6	4.83	5.41	5.41	5.41	0.50	1.45	±13.3%
4950	49.4	5.01	5.12	5.12	5.12	0.50	1.55	±13.3%
5250	48.9	5.36	4.70	4.70	4.70	0.50	1.55	±13.3%
5600	48.5	5.77	4.10	4.10	4.10	0.55	1.50	±13.3%
5750	48.3	5.94	4.15	4.15	4.15	0.50	1.60	±13.3%

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

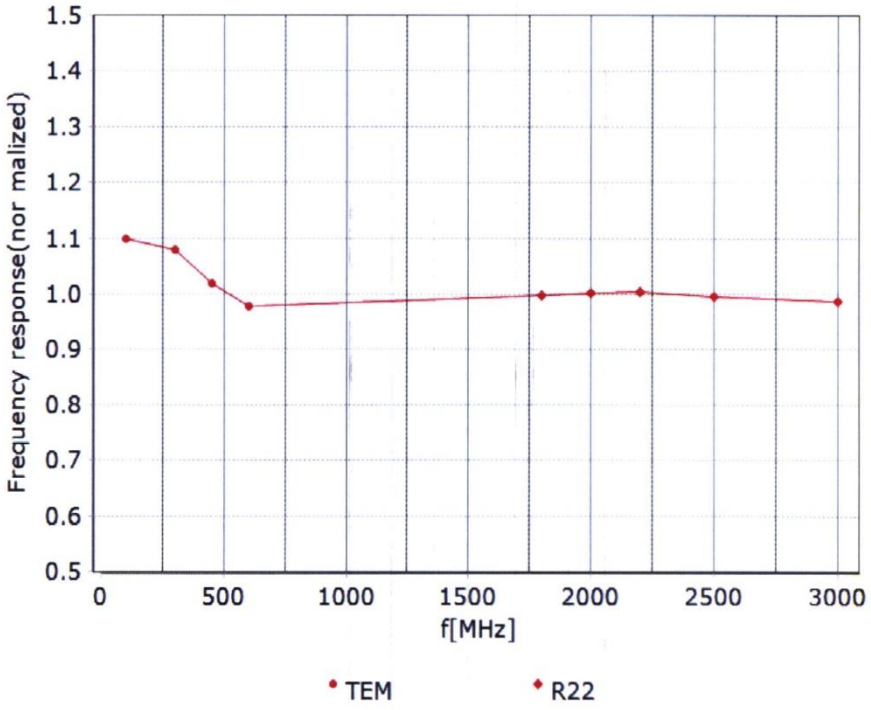
[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty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

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

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

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



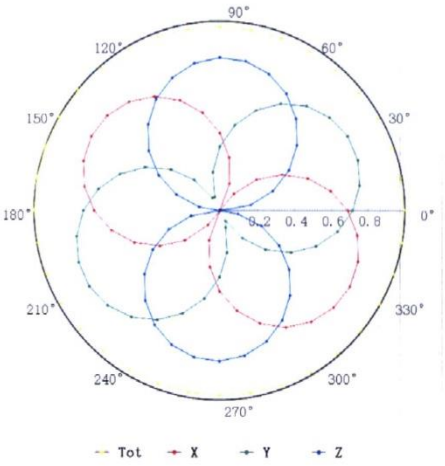
Uncertainty of Frequency Response of E-field: ±7.4% (*k*=2)

In Collaboration with
s p e a g
CALIBRATION LABORATORY

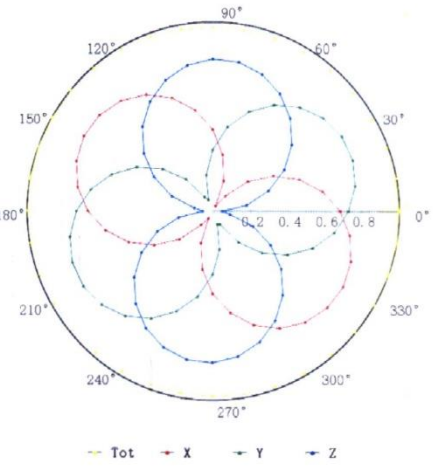
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

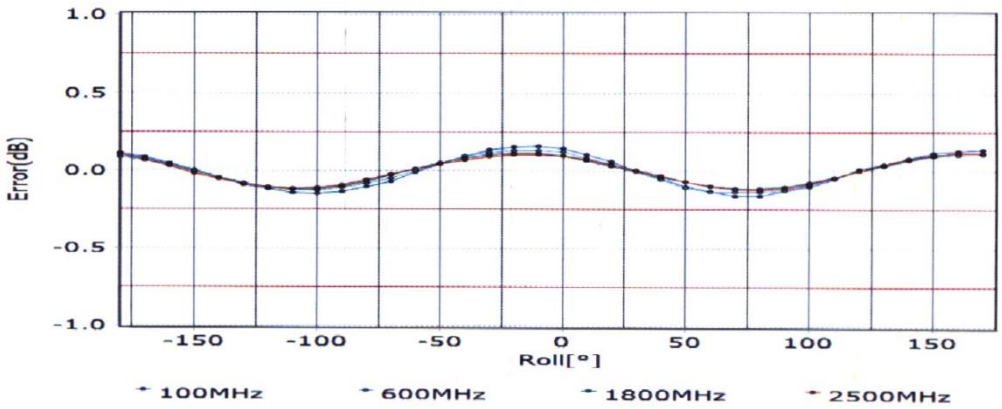
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





Uncertainty of Axial Isotropy Assessment: ±1.2% (*k*=2)

