Table 15.11: SAR Values (CDMA BC1-Body)

Frequency		Mode /Band	Service /Headset	Test Position	Spacing (mm)	Figure No.	Measured average power (dBm)	Maximum allowed Power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.											
Power reduce												
1880	600	CDMA BC1	1xEV-DO-0	Toward Ground	5	21	15.48	16	1.127	0.952	1.073	-0.13
1851.25	25	CDMA BC1	1xEV-DO-0	Toward Ground	5	/	15.57	16	1.104	0.922	1.018	0.15
1908.75	1175	CDMA BC1	1xEV-DO-0	Toward Ground	5	/	15.59	16	1.099	0.946	1.040	0.13
Repeated												
1880	600	CDMA BC1	1xEV-DO-0	Toward Ground	5	/	15.48	16	1.127	0.921	1.038	0.02
Full power												
1880	600	CDMA BC1	1xEV-DO-0	Toward Phantom	5	/	21.7	22	1.072	0.0865	0.093	0.06
1880	600	CDMA BC1	1xEV-DO-0	Toward Ground	19	/	21.7	22	1.072	0.78	0.836	0.06
1851.25	25	CDMA BC1	1xEV-DO-0	Toward Ground	19	/	21.87	22	1.030	0.813	0.838	0.14
1908.75	1175	CDMA BC1	1xEV-DO-0	Toward Ground	19	/	21.89	22	1.026	0.76	0.779	0.06
Repeated												
1851.25	25	CDMA BC1	1xEV-DO-0	Toward Ground	19	/	21.87	22	1.030	0.768	0.791	0.06
Frequency		Mode /Band	Service /Headset	Test Position	Spacing (mm)	Figure No.	Measured average power (dBm)	Maximum allowed Power (dBm)	Scaling factor	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
MHz	Ch.											
Power reduce												
1880	600	CDMA BC1	1xEV-DO-0	Toward Ground	0	22	15.48	16	1.127	1	1.127	0.18
Full power												
1880	600	CDMA BC1	1xEV-DO-0	Toward Phantom	0	/	21.87	22	1.030	0.087	0.090	0.18

Table 15.12: SAR Values (WiFi 802.11b - Body)

Frequency		Mode /Band	Service /Headset	Test Position	Spacing (mm)	Figure No.	Measured average power (dBm)	Maximum allowed Power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.											
Full power												
2462	11	WiFi 2450	802.11b	Toward Phantom	5	/	20.26	21	1.186	0.1	0.119	0.04
2462	11	WiFi 2450	802.11b	Toward Ground	5	23	20.26	21	1.186	0.143	0.170	0.17
Frequency		Mode /Band	Service /Headset	Test Position	Spacing (mm)	Figure No.	Measured average power (dBm)	Maximum allowed Power (dBm)	Scaling factor	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift (dB)
MHz	Ch.											
Full power												
2462	11	WiFi 2450	802.11b	Toward Phantom	0	24	20.26	21	1.186	0.103	0.122	-0.10
2462	11	WiFi 2450	802.11b	Toward Ground	0	/	20.26	21	1.186	0.07	0.083	0.12

16. Simultaneous TX SAR Considerations

Table16.1 Simultaneous transmission SAR

Standalone SAR for 2G(W/Kg)				
Test Position		GSM 850	GSM 1900	Highest SAR
0mm	Phantom Side	1.216	0.215	1.216
0mm	Ground Side	0.721	1.529	1.529
5mm	Phantom Side	1.020	0.187	1.020
5mm	Ground Side	0.621	1.016	1.016
19mm	Ground Side	0.439	1.359	1.359

Standalone SAR for 3G(W/Kg)							
Test Position		WCDMA Band II	WCDMA Band IV	WCDMA Band V	BC0	BC1	Highest SAR
0mm	Phantom Side	0.080	0.067	0.857	0.425	0.090	0.857
0mm	Ground Side	0.643	0.642	0.314	1.073	1.127	1.127
5mm	Phantom Side	0.110	0.069	0.277	0.346	0.093	0.346
5mm	Ground Side	0.745	0.599	0.722	1.035	1.073	1.073
19mm	Ground Side	0.778	0.570	--	0.538	0.838	0.838

Standalone SAR for 4G (W/Kg)						
Test Position		LTE Band 2	LTE Band 4	LTE Band7	LTE Band 17	Highest SAR
0mm	Phantom Side	0.054	0.067	0.139	0.233	0.233
0mm	Ground Side	1.215	0.775	0.375	0.517	1.215
5mm	Phantom Side	0.087	0.101	0.240	0.174	0.240
5mm	Ground Side	1.218	0.810	0.456	0.183	1.218
19mm	Ground Side	0.023	0.036	0.397	0.102	0.397

Simultaneous multi-band transmission									
Test Position		2G	3G	4G	2.4GHz		5GHz	SUM	
					BT	WiFi	WiFi	2.4GHz	5GHz
0mm(10g)	Phantom Side	1.216	0.857	0.233	0.067	0.122	0.026	1.338	1.283
	Ground Side	1.529	1.127	1.215	0.067	0.083	0.033	1.612	1.596
5mm(1g)	Phantom Side	1.020	0.346	0.240	0.167	0.119	0.023	1.187	1.187
	Ground Side	1.016	1.073	1.218	0.167	0.170	0.01	1.388	1.385
19mm(1g)	Ground Side	1.359	0.838	0.397	0.044	--	--	1.403	1.403

According to the conducted power measurement result, we can draw the conclusion that: stand-alone SAR for WiFi should be performed. Then, simultaneous transmission SAR for WiFi/BT is considered with measurement results of GSM/WCDMA/LTE/CDMA and WiFi/BT. According to the above table, the sum of reported SAR values for GSM/WCDMA/LTECDMA and WiFi<1.6W/kg. So the simultaneous transmission SAR is not required for WiFi/BT transmitter.

17. 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; steps2) 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 ≥ 1.45W/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 17.1: SAR Measurement Variability for Body Value (1g)

Frequency		Configuration	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio
MHz	Ch.					
836.6	190	GPRS 2TS	Ground	0.845	0.872	1.032
1880	661	GPRS 2TS	Ground	0.964	0.941	1.024
848.31	777	1xEV-DO-0	Ground	0.865	0.857	1.009
1880	600	1xEV-DO-0	Ground	0.952	0.921	1.034

Note: According to the KDB 865664 D01repeated measurement is not required when the original highest measured SAR is < 0.8 W/kg.

18. Test Equipments Utilized

18.1. SAR Test System

Item.	Instrument Name	Type	Serial Number	Manufacturer	Calibration Date	Valid Period
01	Network analyzer	N5242A	MY51221755	Agilent	Dec 17, 2018	1 year
02	Power meter	NRVD	102257	RS	May 11, 2018	1 year
03	Power sensor	NRV-Z5	100241			
			100644			
04	Signal Generator	E4438C	MY49072044	Agilent	May 11, 2018	1 Year
05	Amplifier	NTWPA-0086010 F	12023024	rflight	No Calibration Requested	
06	Coupler	778D	MY4825551	Agilent	May 11, 2018	1 year
07	BTS	E5515C	MY50266468	Agilent	Dec 17, 2018	1 year
		MT8820C	6201240338	Anritsu	Dec 17, 2018	1 year
08	E-field Probe	ES3DV3	3252	SPEAG	Sep 4,2018	1 year
09	DAE	SPEAG DAE4	1244	SPEAG	Dec 3,2018	1 year
10	Dipole Validation Kit	SPEAG D750V3	1144	SPEAG	Oct 26, 2018	3 year
		SPEAG D835V2	4d112	SPEAG	Oct 25, 2018	3 year
		SPEAG D1750V2	1044	SPEAG	Oct 31, 2018	3 year
		SPEAG D1900V2	5d151	SPEAG	Dec 6,2017	3 year
		SPEAG D2450V2	858	SPEAG	Oct 26,2018	3 year
		SPEAG D2600V2	1031	SPEAG	Nov. 1,2018	3 year

19. Measurement Uncertainty

Measurement uncertainty evaluation for SAR test

Error Description	Unc. value, ±%	Prob. Dist.	Div.	c_i 1g	c_i 10g	Std.Unc. ±%,1g	Std.Unc. ±%,10g	V_i v_{eff}
Measurement System								
Probe Calibration	6.0	N	1	1	1	6.0	6.0	∞
Axial Isotropy	0.5	R	$\sqrt{3}$	0.7	0.7	0.2	0.2	∞
Hemispherical Isotropy	2.6	R	$\sqrt{3}$	0.7	0.7	1.1	1.1	∞
Boundary Effects	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
Linearity	0.6	R	$\sqrt{3}$	1	1	0.3	0.3	∞
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Readout Electronics	0.7	N	1	1	1	0.7	0.7	∞
Response Time	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	1.5	R	$\sqrt{3}$	1	1	0.9	0.9	∞
Probe Positioning	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Max. SAR Eval.	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test Sample Related								
Device Positioning	2.9	N	1	1	1	2.9	2.9	145
Device Holder	3.6	N	1	1	1	3.6	3.6	5
Phantom and Setup								
Phantom Uncertainty	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Liquid Conductivity (target)	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (meas.)	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid Permittivity (target)	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (meas.)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined Std. Uncertainty		RSS				9.27	9.07	
Expanded STD Uncertainty		k=2				18.53	18.14	

Measurement uncertainty evaluation for system validation

Error Description	Unc. value, ±%	Prob. Dist.	Div.	c_i 1g	c_i 10g	Std.Unc. ±%,1g	Std.Unc. ±%,10g	V_i v_{eff}
Measurement System								
Probe Calibration	6.0	N	1	1	1	6.0	6.0	∞
Axial Isotropy	0.5	R	$\sqrt{3}$	0.7	0.7	0.2	0.2	∞
Hemispherical Isotropy	2.6	R	$\sqrt{3}$	0.7	0.7	1.1	1.1	∞
Boundary Effects	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
Linearity	0.6	R	$\sqrt{3}$	1	1	0.3	0.3	∞
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Readout Electronics	0.7	N	1	1	1	0.7	0.7	∞
Response Time	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	1.5	R	$\sqrt{3}$	1	1	0.9	0.9	∞
Probe Positioning	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Max. SAR Eval.	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Diople								
Power Drift	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Dipole Positioning	2.0	N	1	1	1	2.0	2.0	∞
Dipole Input Power	5.0	N	1	1	1	5.0	5.0	∞
Phantom and Setup								
Phantom Uncertainty	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Liquid Conductivity (target)	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (meas.)	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid Permittivity (target)	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (meas.)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined Std Uncertainty						±11.2%	±10.9%	387
Expanded Std Uncertainty						**±22.4%**	**±21.8%**	

Measurement uncertainty evaluation for Fast SAR test

Error Description	Unc. value, ±%	Prob. Dist.	Div.	ci	ci	Std.Unc.	Std.Unc.	Vi
				1g	10g	±%,1g	±%,10g	veff
Probe Calibration	6	N	1	1	1	6.00	6.00	∞
Axial Isotropy	0.5	R	√3	0.7	0.7	0.20	0.20	∞
Hemispherical Isotropy	2.6	R	√3	1	1	1.50	1.50	∞
Boundary Effects	0.8	R	√3	0.7	0.7	0.32	0.32	∞
Linearity	0.6	R	√3	1	1	0.35	0.35	∞
System Detection Limits	1	R	√3	1	1	0.58	0.58	∞
Readout Electronics	0.7	R	√3	1	1	0.40	0.40	∞
Response Time	0	N	1	1	1	0.00	0.00	∞
Integration Time	2.6	R	√3	1	1	1.50	1.50	∞
RF Ambient Noise	3	R	√3	1	1	1.73	1.73	∞
RF Ambient Reflections	3	R	√3	1	1	1.73	1.73	∞
Probe Positioner	1.5	R	√3	1	1	0.87	0.87	∞
Probe Positioning	2.9	R	√3	1	1	1.67	1.67	∞
Max. SAR Eval.	1	R	√3	1	1	0.58	0.58	∞
Fast SAR z-Approximation	7	R	√3	1	1	4.04	4.04	∞
Test sample Related								
Test sample Positioning	2.9	N	1	1	1	2.9	2.9	145
Device Holder Uncertainty	3.6	N	1	1	1	3.6	3.6	5
Phantom and Tissue Parameters								
Phantom Uncertainty	4	R	√3	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5	R	√3	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (meas)	2.5	N	1	0.64	0.43	0.92	0.62	∞
Liquid Permittivity (target)	5	R	√3	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (meas)	2.5	N	1	0.6	0.49	0.87	0.71	∞
Combined Std. Uncertainty		RSS				**10.11**	**9.93**	
Expanded STD Uncertainty		k=2				**20.22**	**19.86**	

END OF REPORT BODY

ANNEX A. Graph Results

Fig.1 GPRS850 2TS Phantom Mode Middle Repeated

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 56.715; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 2TS (0); Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018
GPRS850 2TS Phantom Mode Middle Repeated/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.938 W/kg
GPRS850 2TS Phantom Mode Middle Repeated/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.07 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.872 W/kg; SAR(10 g) = 0.608 W/kg
Maximum value of SAR (measured) = 0.925 W/kg

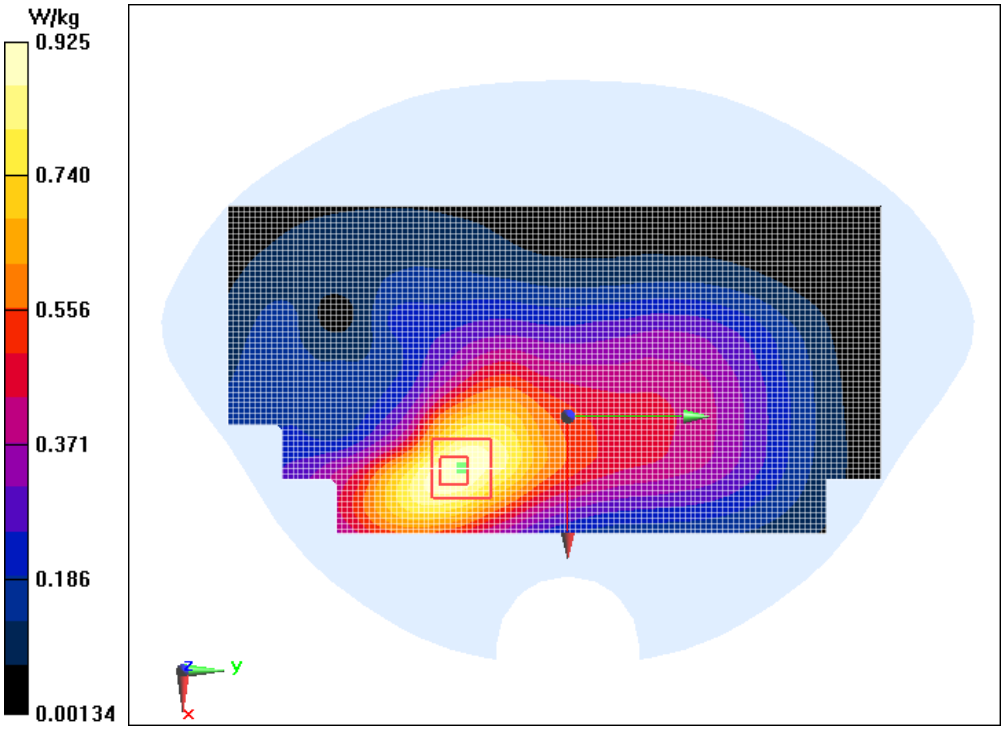


Fig.2GPRS850 2TS Phantom Mode Middle

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 56.715; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 2TS (0); Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018

GPRS850 2TS Phantom Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.63 W/kg

GPRS850 2TS Phantom Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.31 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.13 W/kg
SAR(1 g) = 1.52 W/kg; SAR(10 g) = 1.04 W/kg
Maximum value of SAR (measured) = 1.61 W/kg

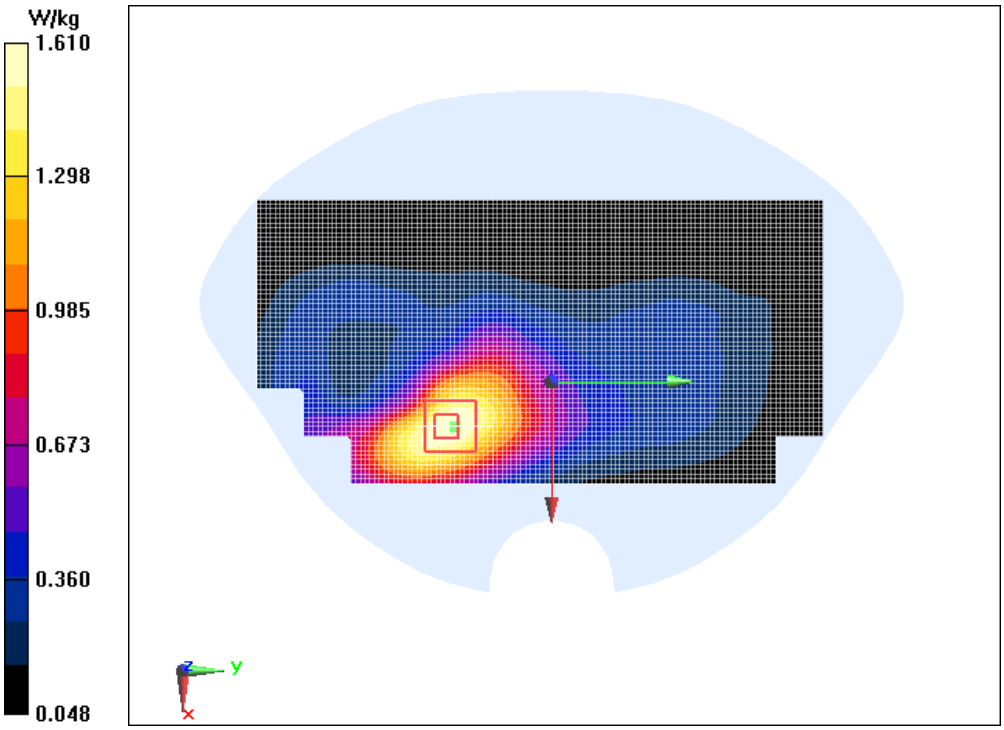


Fig.3 GSM1900 GPRS2TS Ground Mode Middle

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 2TS (0); Frequency: 1880 MHz; Duty Cycle: 1:4.15
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018
GPRS2TS Ground Mode Middle/Area Scan (61x81x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.4 W/kg
GPRS2TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.846 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.97 W/kg
SAR(1 g) = 1.31 W/kg; SAR(10 g) = 0.828 W/kg
Maximum value of SAR (measured) = 1.40 W/kg

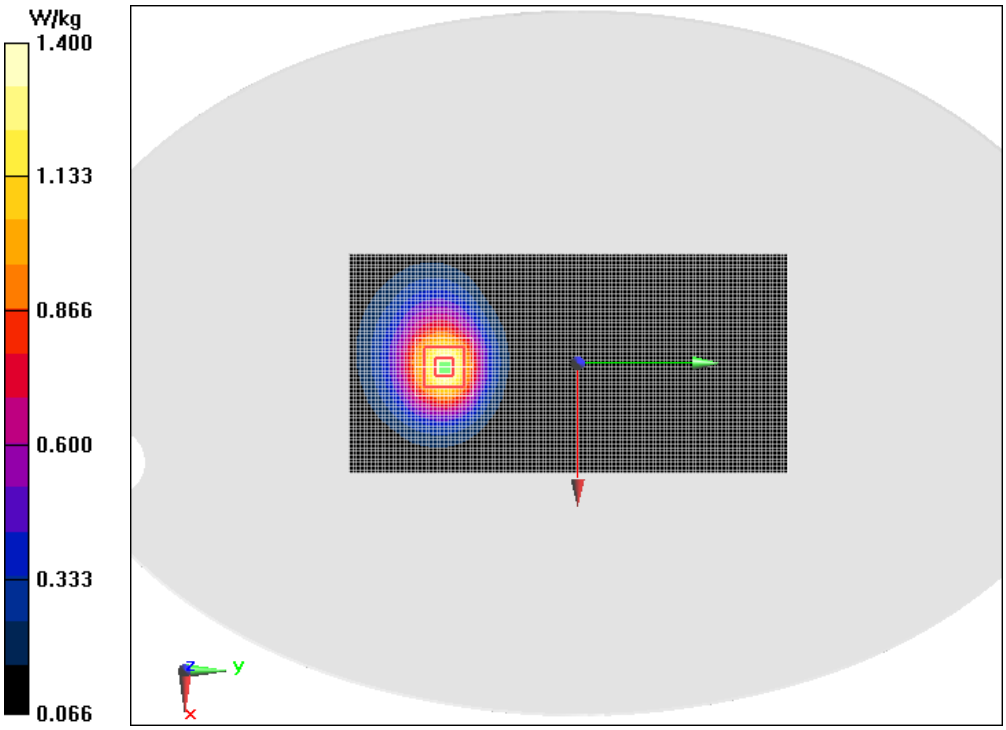


Fig.4 GSM1900GPRS2TS Ground Mode Middle

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 2TS (0); Frequency: 1880 MHz; Duty Cycle: 1:4.15
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018

GPRS2TS Ground Mode Middle/Area Scan (61x81x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 3.49 W/kg

GPRS2TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.729 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 6.32 W/kg
SAR(1 g) = 3.12 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 3.57 W/kg

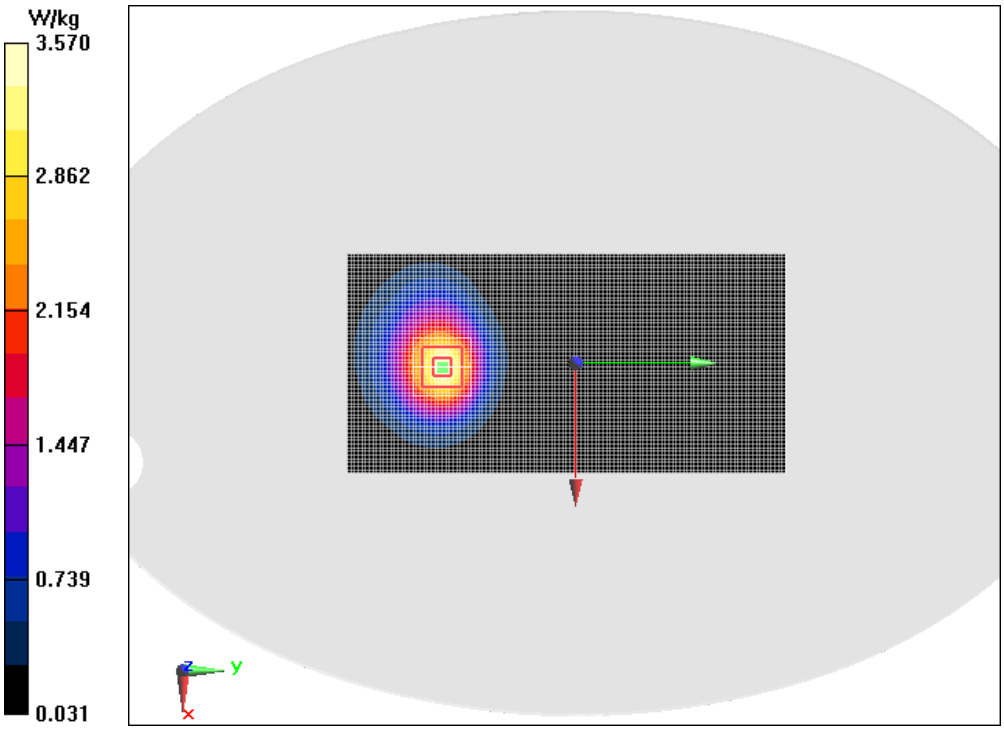


Fig.5 WCDMA Band 2 Ground Mode Middle

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Professional Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018

WCDMA Band 2 Ground Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.824 W/kg

WCDMA Band 2 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.393 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.750 W/kg; SAR(10 g) = 0.473 W/kg
Maximum value of SAR (measured) = 0.812 W/kg

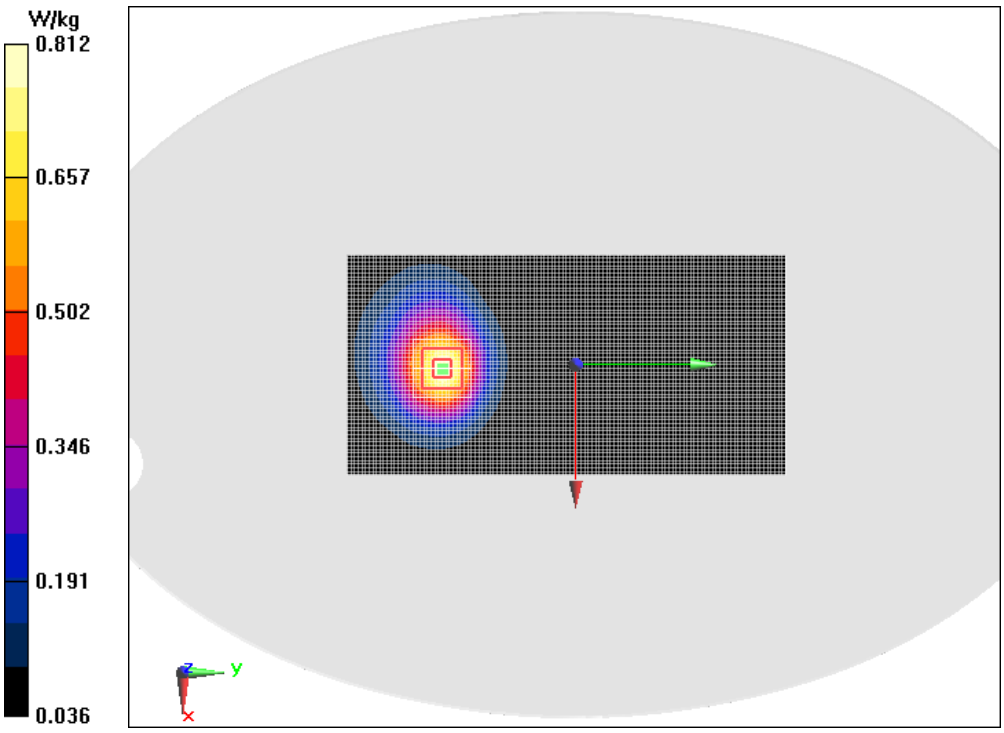


Fig.6 WCDMA Band 2 Ground Mode Middle

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Professional Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018

WCDMA Band 2 Ground Mode Middle /Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.46 W/kg

WCDMA Band 2 Ground Mode Middle /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.7260 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.620 W/kg
Maximum value of SAR (measured) = 1.37 W/kg

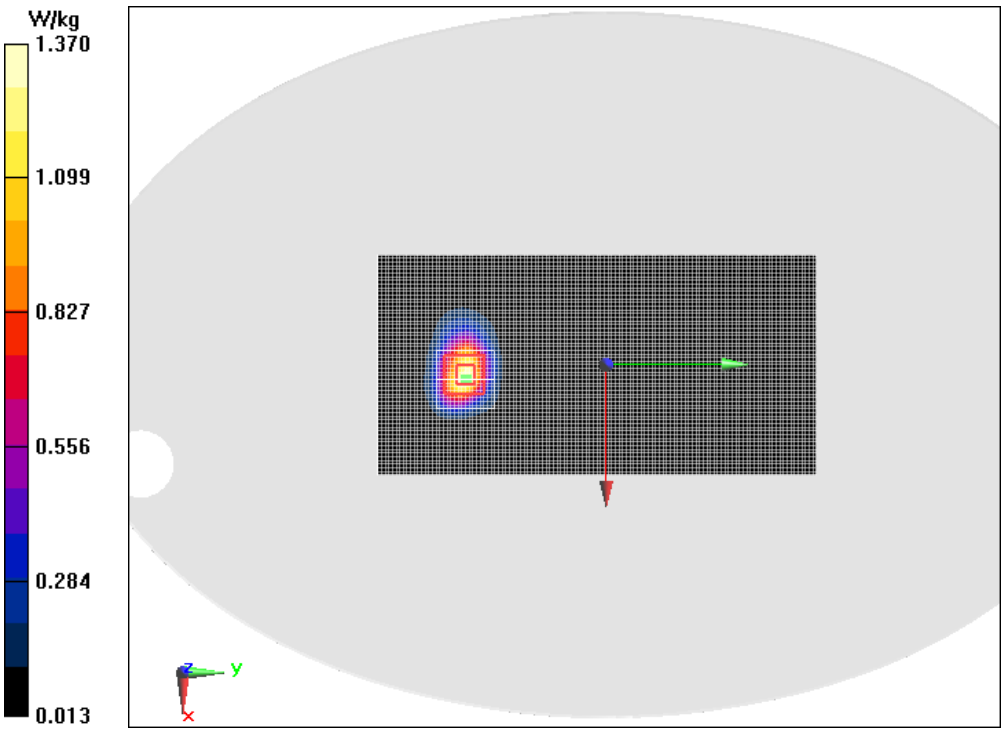


Fig.7 WCDMA Band 4 Ground Mode Middle

Date/Time: 2019/1/4
Electronics: DAE4 Sn1244
Medium parameters used: f = 1733 MHz; σ = 1.408 S/m; ε_r = 55.442; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Professional 1800MHz; Frequency: 1732.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.99, 4.99, 4.99); Calibrated: 9/4/2018

WCDMA Band 4 Ground Mode Middle/Area Scan (61x81x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.633 W/kg

WCDMA Band 4 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.532 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.820 W/kg
SAR(1 g) = 0.560 W/kg; SAR(10 g) = 0.367 W/kg
Maximum value of SAR (measured) = 0.602 W/kg

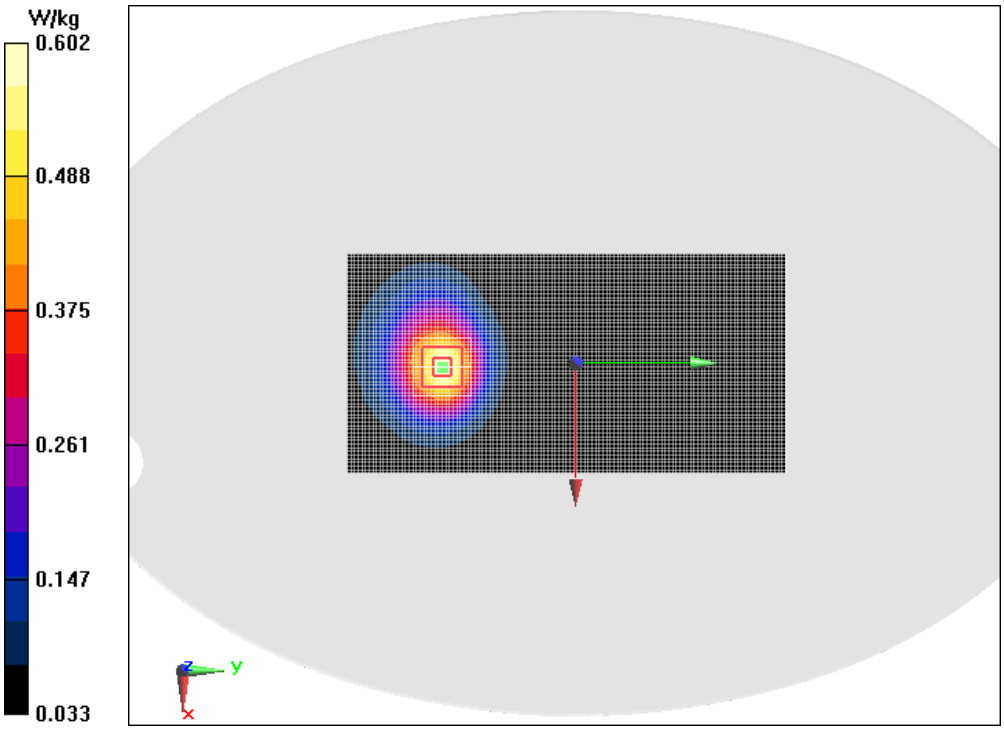


Fig.8 WCDMA Band 4 Ground Mode Middle

Date/Time: 2019/1/4
Electronics: DAE4 Sn1244
Medium parameters used: f = 1733 MHz; σ = 1.408 S/m; ε_r = 55.442; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Professional 1800MHz; Frequency: 1732.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.99, 4.99, 4.99); Calibrated: 9/4/2018
WCDMA Band 4 Ground Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.27 W/kg
WCDMA Band 4 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.9780 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.01 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.575 W/kg
Maximum value of SAR (measured) = 1.23 W/kg

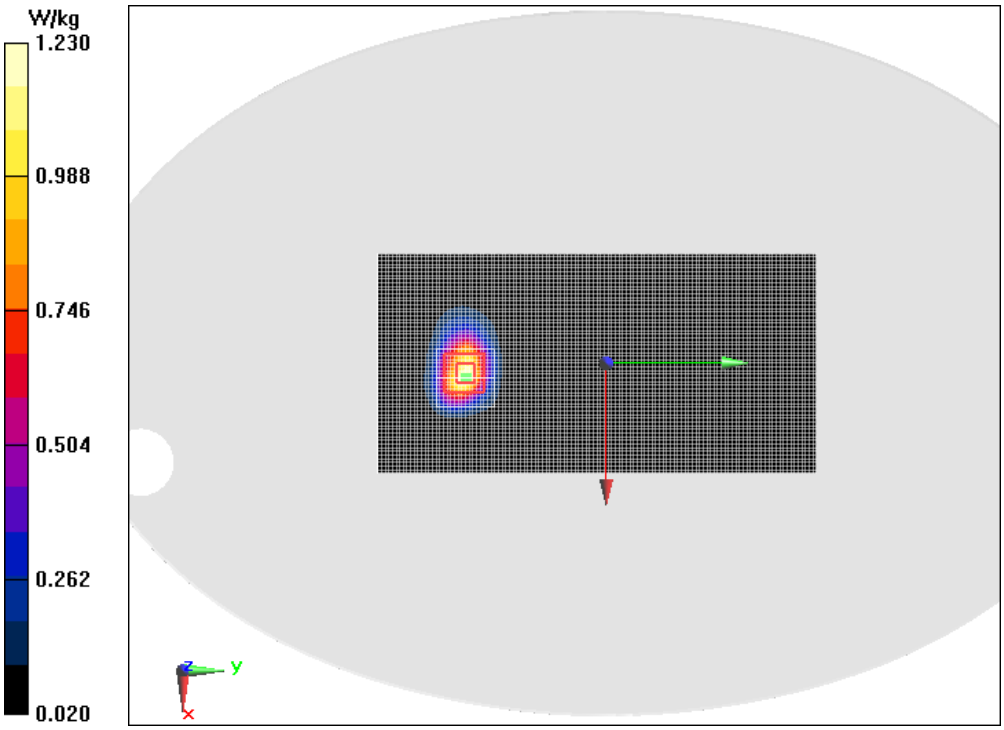


Fig.9 WCDMA Band 5 Ground Mode Middle

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 56.715; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Professional Band Ⅴ; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018

WCDMA Band 5 Ground Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.568 W/kg

WCDMA Band 5 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.893 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.620 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 0.696 W/kg

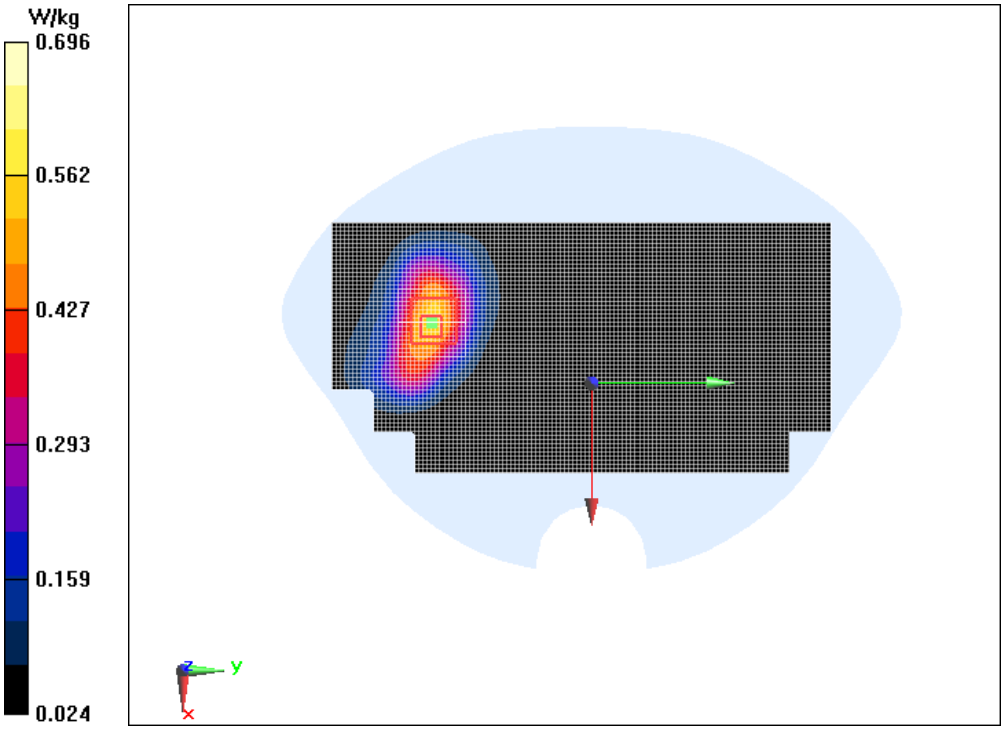


Fig.10 WCDMA Band 5 Ground Mode Middle

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 56.715; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Professional Band Ⅴ; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018

WCDMA Band 5 Ground Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.76 W/kg

WCDMA Band 5 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.5440 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 3.23 W/kg
SAR(1 g) = 1.5 W/kg; SAR(10 g) = 0.736 W/kg
Maximum value of SAR (measured) = 1.79 W/kg

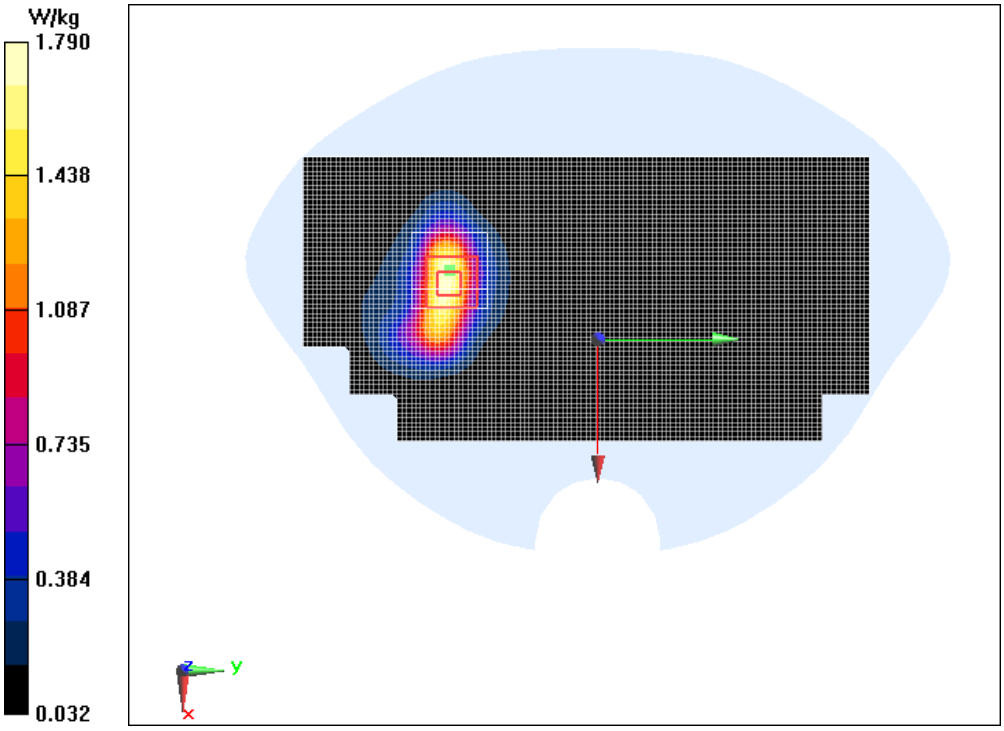


Fig.11 LTE Band 2 1RB 50 offset Ground Mode High

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1900 MHz; σ = 1.556 S/m; ε_r = 52.078; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 2 Professional 1900MHz; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018
LTE Band 2 1RB 50 offset Ground Mode High/Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.08 W/kg
LTE Band 2 1RB 50 offset Ground Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.6890 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.955 W/kg; SAR(10 g) = 0.491 W/kg
Maximum value of SAR (measured) = 1.07 W/kg

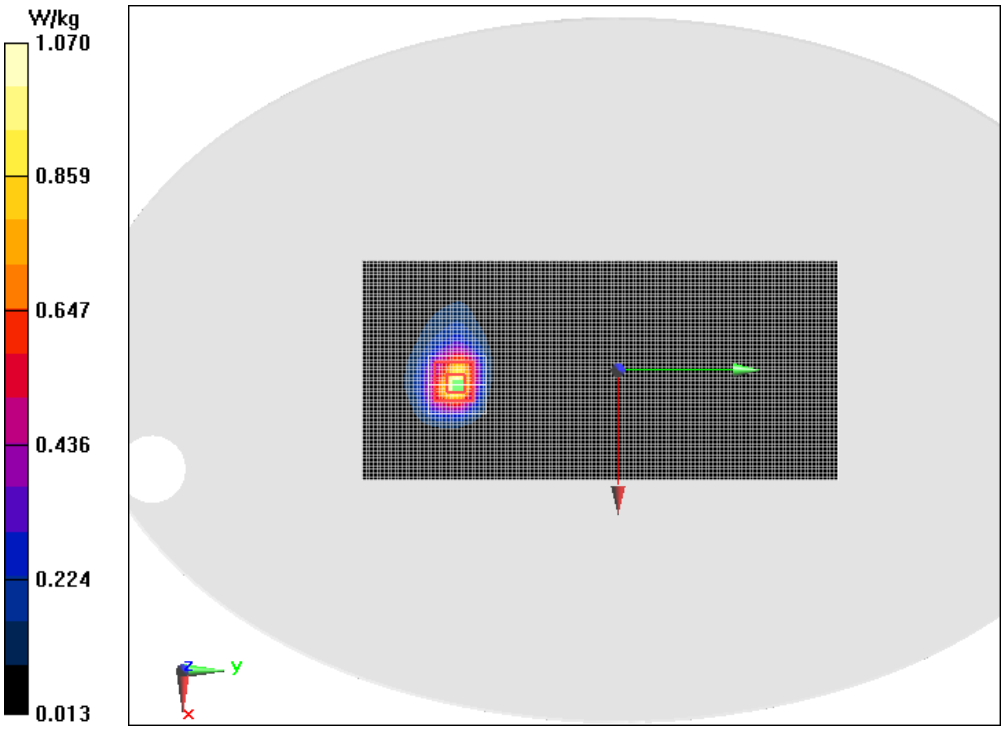


Fig.12 LTE Band 2 1RB 50 offset Ground Mode Low

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1860 MHz; σ = 1.515 S/m; ε_r = 52.211; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 2 Professional 1900MHz; Frequency: 1860 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018
LTE Band 2 1RB 50 offset Ground Mode Low /Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 2.61 W/kg
LTE Band 2 1RB 50 offset Ground Mode Low /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.172 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 4.59 W/kg
SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.1 W/kg
Maximum value of SAR (measured) = 2.65 W/kg

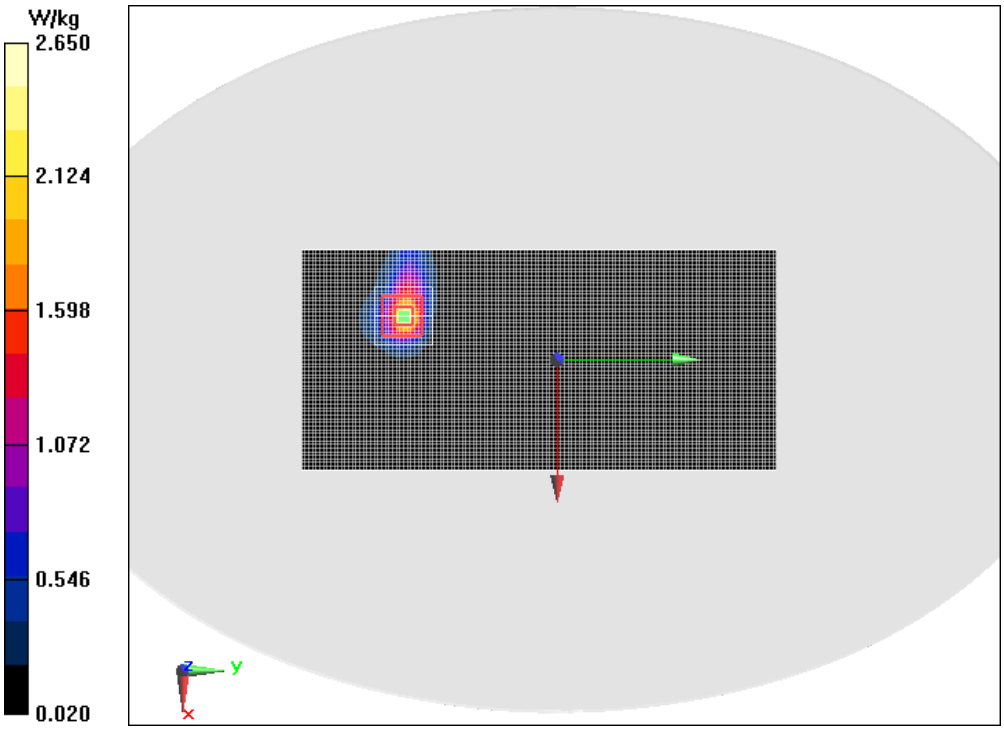


Fig.13 LTE Band 4 1RB 0 offset Ground Mode High 5mm

Date/Time: 2019/1/4
Electronics: DAE4 Sn1244
Medium parameters used: f = 1745 MHz; σ = 1.421 S/m; ε_r = 55.399; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 4 Professional 1800MHz; Frequency: 1745 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.99, 4.99, 4.99); Calibrated: 9/4/2018
LTE Band 4 1RB 0 offset Ground Mode High 5mm/Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.803 W/kg
LTE Band 4 1RB 0 offset Ground Mode High 5mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.078 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.710 W/kg; SAR(10 g) = 0.398 W/kg
Maximum value of SAR (measured) = 0.770 W/kg

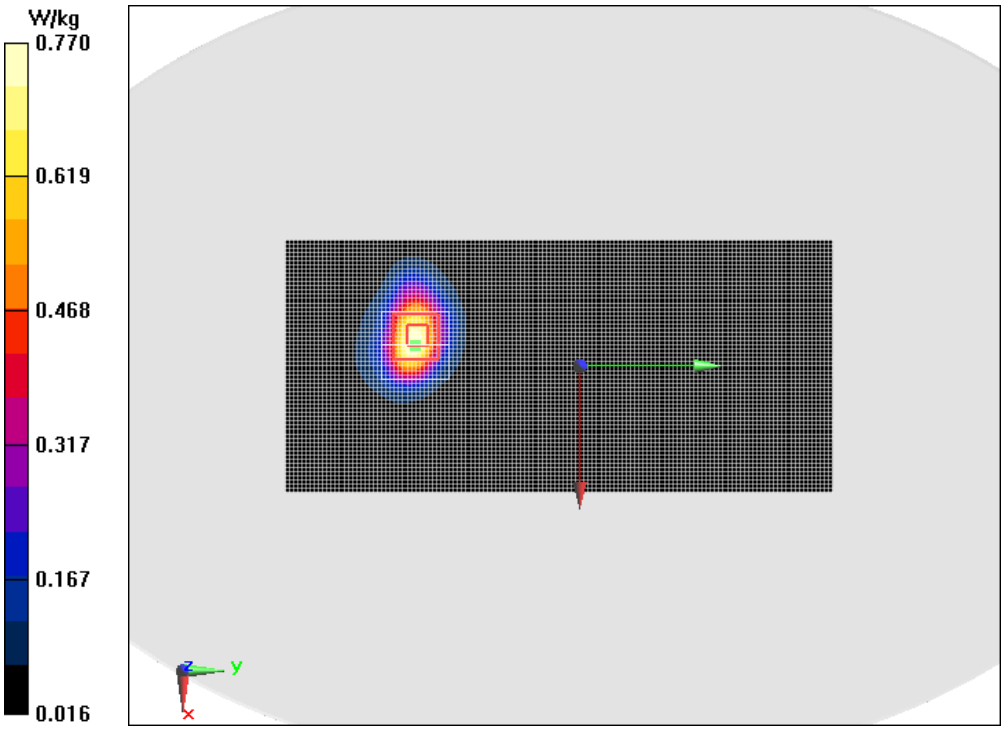


Fig.14 LTE Band 4 1 RB 0 offset Ground Mode High

Date/Time: 2019/1/4
Electronics: DAE4 Sn1244
Medium parameters used: f = 1745 MHz; σ = 1.421 S/m; ε_r = 55.399; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 4 Professional 1800MHz; Frequency: 1745 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.99, 4.99, 4.99); Calibrated: 9/4/2018
LTE Band 4 1 RB 0 offset Ground Mode High/Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.64 W/kg
LTE Band 4 1 RB 0 offset Ground Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.1480 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 2.40 W/kg
SAR(1 g) = 1.31 W/kg; SAR(10 g) = 0.680 W/kg
Maximum value of SAR (measured) = 1.42 W/kg

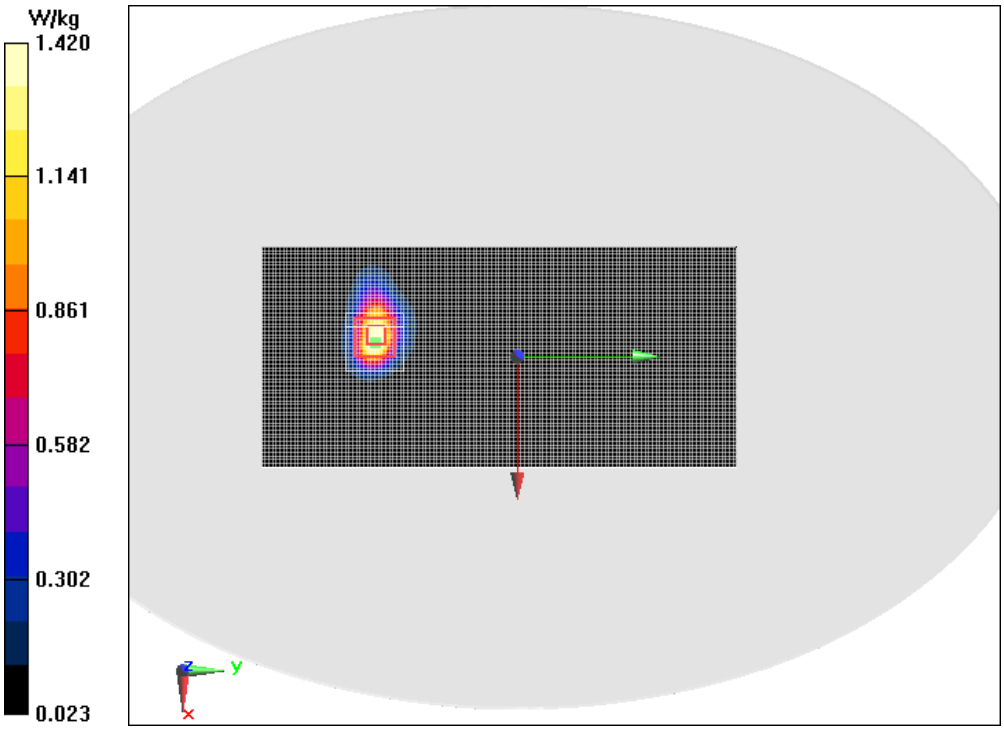


Fig.15 LTE Band 7 1RB 50 offset Ground Mode Middle 5mm

Date/Time: 2019/1/5
Electronics: DAE4 Sn1244
Medium parameters used: f = 2535 MHz; σ = 2.031 S/m; ε_r = 54.546; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 7 Professional 2600MHz; Frequency: 2535 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.41, 4.41, 4.41); Calibrated: 9/4/2018
LTE Band 7 1RB 50 offset Ground Mode Middle 5mm/Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.467 W/kg
LTE Band 7 1RB 50 offset Ground Mode Middle 5mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.1610 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.442 W/kg; SAR(10 g) = 0.191 W/kg
Maximum value of SAR (measured) = 0.460 W/kg

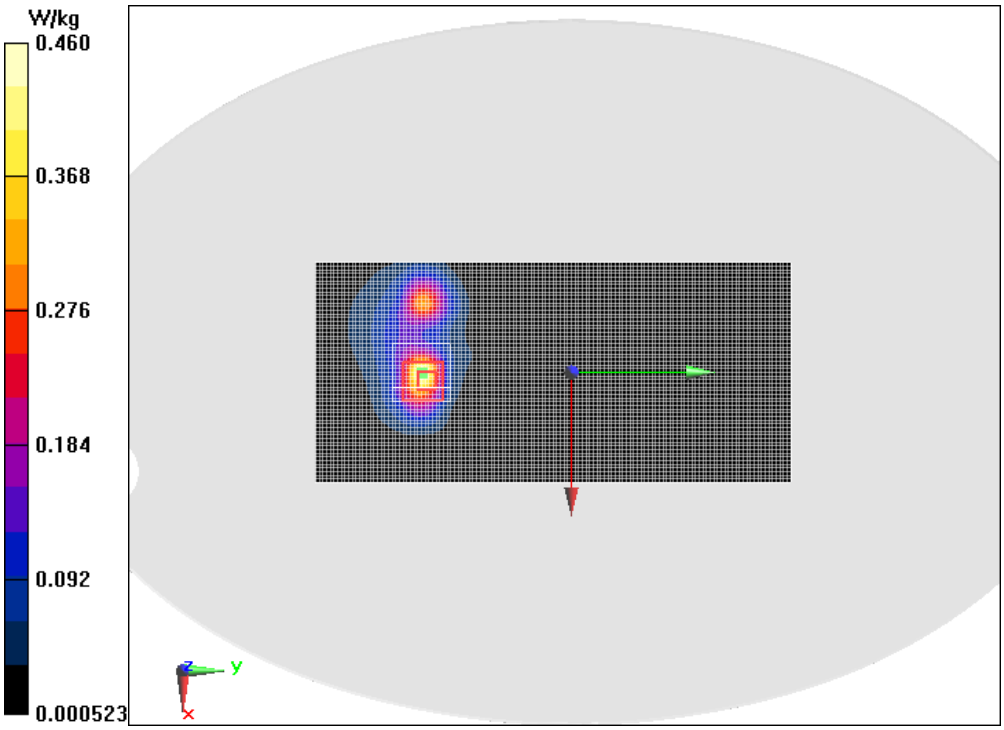


Fig.16 LTE Band 7 1RB 50 offset Ground Mode Middle

Date/Time: 2019/1/5
Electronics: DAE4 Sn1244
Medium parameters used: f = 2535 MHz; σ = 2.031 S/m; ε_r = 54.546; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 7 Professional 2600MHz; Frequency: 2535 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.41, 4.41, 4.41); Calibrated: 9/4/2018
LTE Band 7 1RB 50 offset Ground Mode Middle /Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.07 W/kg
LTE Band 7 1RB 50 offset Ground Mode Middle /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.44 W/kg
SAR(1 g) = 0.943 W/kg; SAR(10 g) = 0.363 W/kg
Maximum of SAR (measured) = 1.05 W/kg

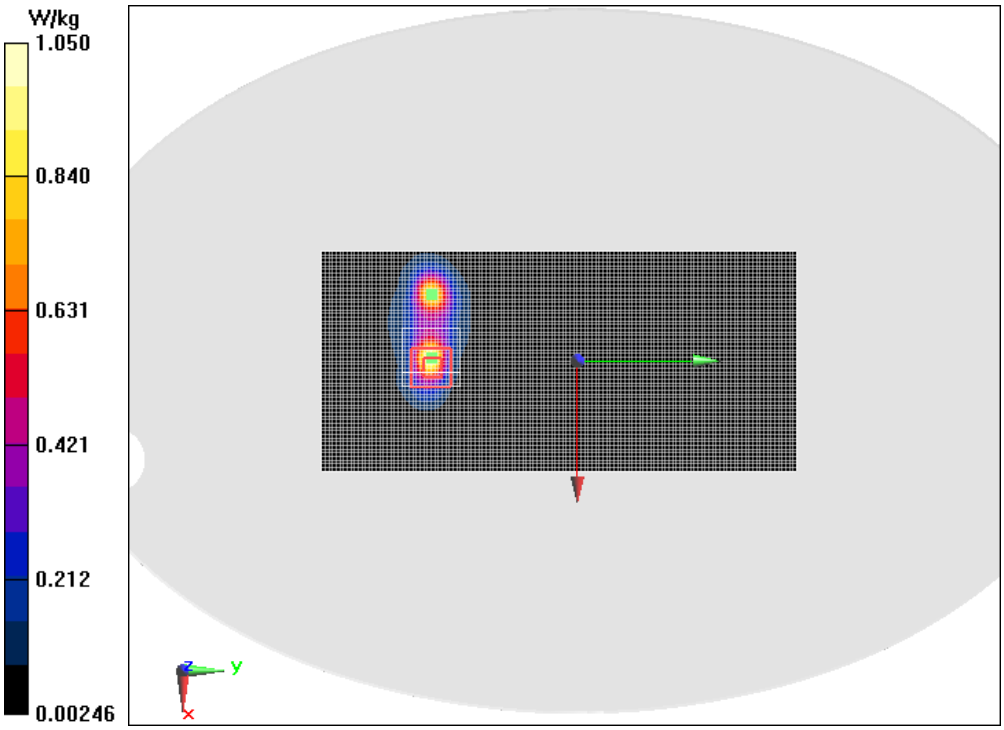


Fig.17 LTE Band17 10MHz 1RB 49 offset Ground Mode Middle

Date/Time: 2019/1/11
Electronics: DAE4 Sn1244
Medium parameters used: f = 710 MHz; σ = 0.877 S/m; ε_r = 58.181; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 17 Professional 850MHz; Frequency: 710 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.53, 6.53, 6.53); Calibrated: 9/4/2018

LTE Band17 10MHz 1RB 49 offset Ground Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.149 W/kg

LTE Band17 10MHz 1RB 49 offset Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.353 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.087 W/kg
Maximum of SAR (measured) = 0.162 W/kg

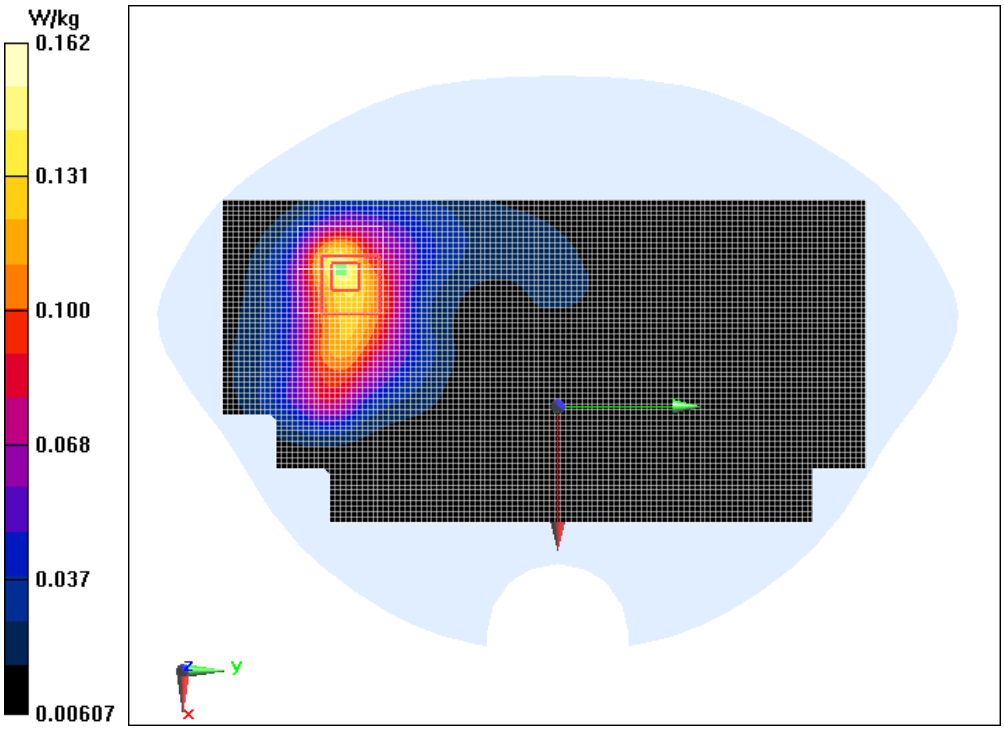


Fig.18 LTE Band17 10MHz 1RB 49 offset Ground Mode Middle

Date/Time: 2019/1/11
Electronics: DAE4 Sn1244
Medium parameters used: f = 710 MHz; σ = 0.877 S/m; ε_r = 58.181; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: LTE Band 17 Professional 850MHz; Frequency: 710 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.53, 6.53, 6.53); Calibrated: 9/4/2018

LTE Band17 10MHz 1RB 49 offset Ground Mode Middle/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.904 W/kg

LTE Band17 10MHz 1RB 49 offset Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.413 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.31 W/kg
SAR(1 g) = 0.853 W/kg; SAR(10 g) = 0.417 W/kg
Maximum of SAR (measured) = 0.955 W/kg

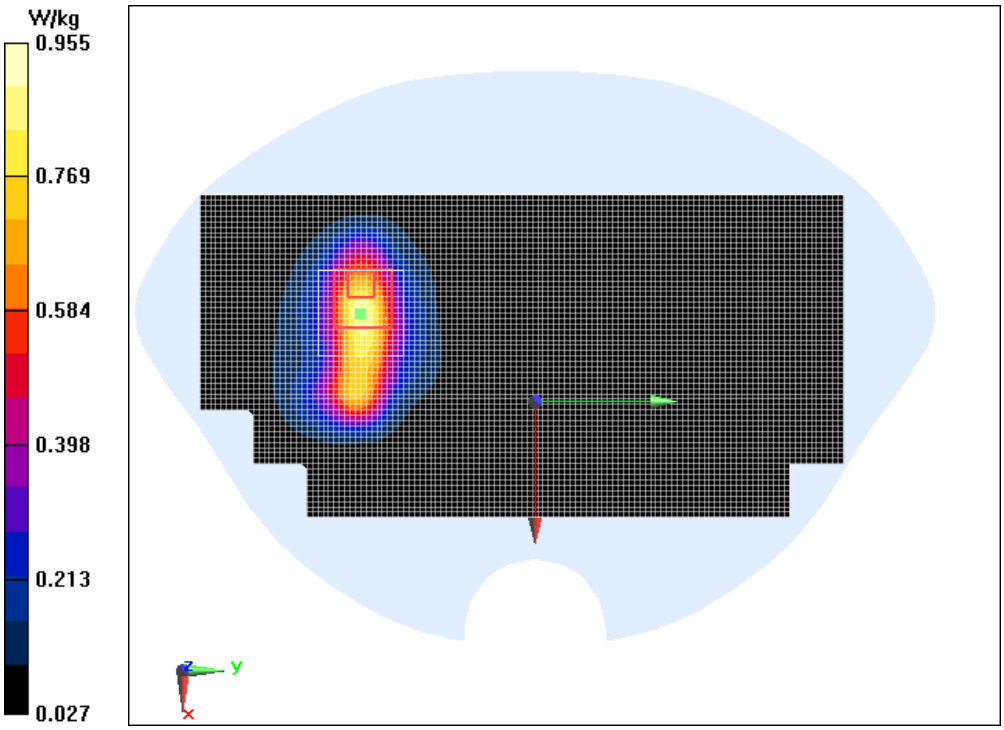


Fig.19 CDMA BC0 Ground Mode High

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used (interpolated): f = 848.31 MHz; σ = 1.012 S/m; ε_r = 56.596; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CDMA 835MHz 850MHz; Frequency: 848.31 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018
CDMA BC0 Ground Mode High/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.897 W/kg
CDMA BC0 Ground Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.949 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.59 W/kg
SAR(1 g) = 0.865 W/kg; SAR(10 g) = 0.474 W/kg
Maximum value of SAR (measured) = 0.969 W/kg

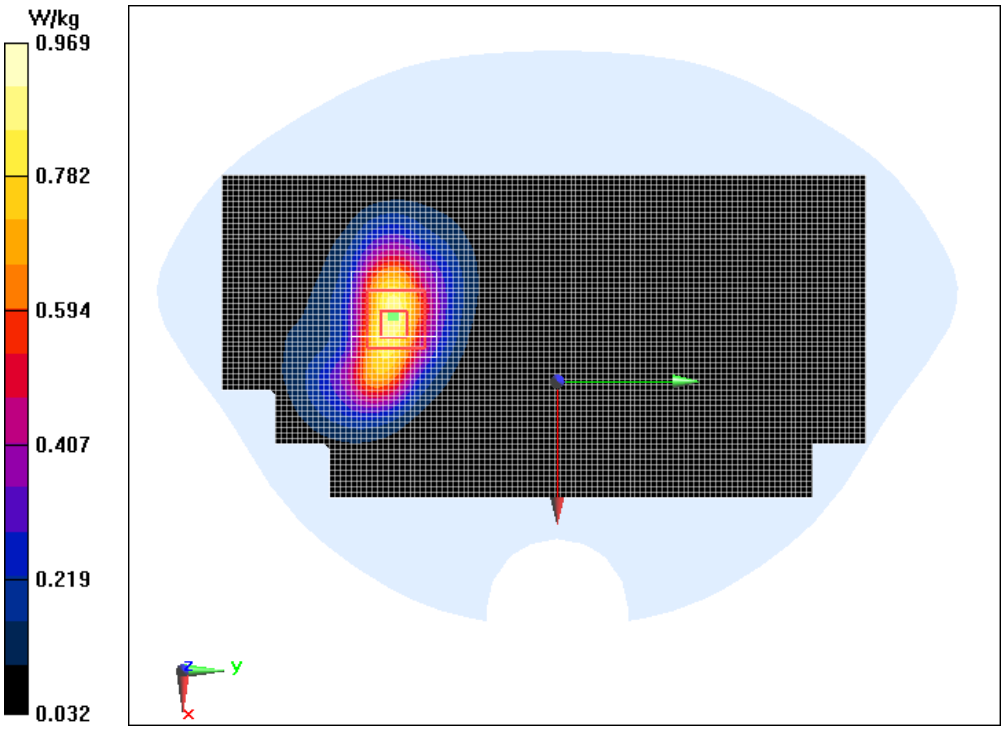


Fig.20 CDMA BC0 Ground Mode Middle N06

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 56.715; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CDMA 835MHz 850MHz; Frequency: 836.52 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018

CDMA BC0 Ground Mode Middle N06/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.46 W/kg

CDMA BC0 Ground Mode Middle N06/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.290 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.74 W/kg
SAR(1 g) = 1.79 W/kg; SAR(10 g) = 0.899 W/kg
Maximum value of SAR (measured) = 1.97 W/kg

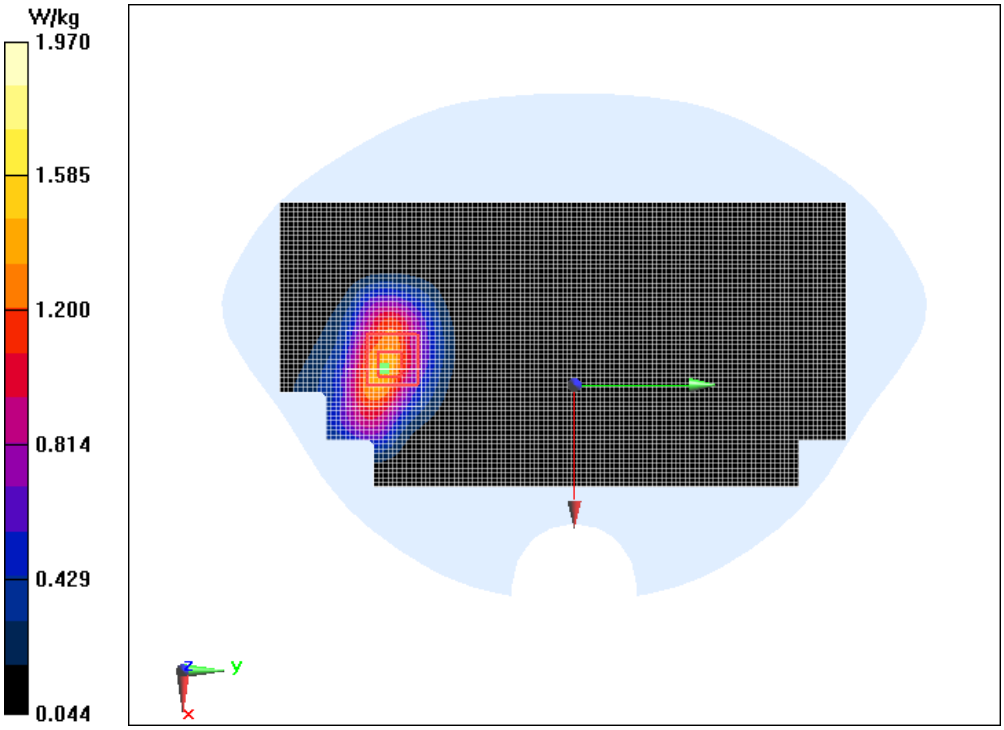


Fig.21 CDMA BC1 Ground Mode Middle

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CDMA 1900MHz 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018

CDMA BC1 Ground Mode Middle/Area Scan (61x81x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.21 W/kg

CDMA BC1 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.860 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.952 W/kg; SAR(10 g) = 0.523 W/kg
Maximum value of SAR (measured) = 1.07 W/kg

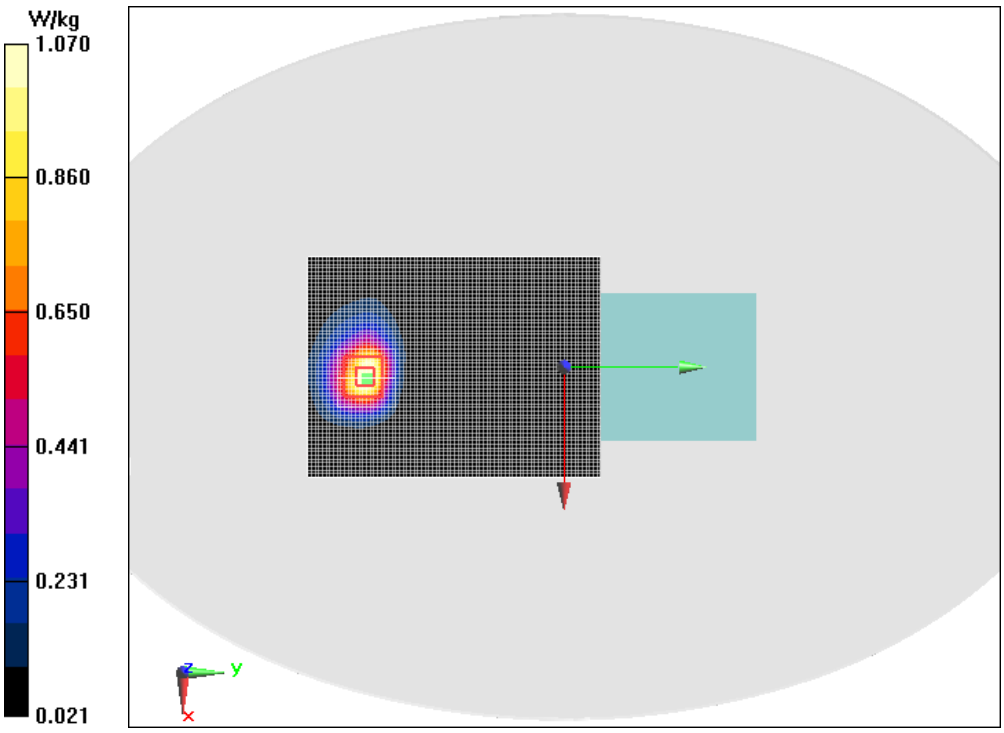


Fig.22 CDMA BC1 Ground Mode Middle

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CDMA 1900MHz 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018
CDMA BC1 Ground Mode Middle/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 2.26 W/kg
CDMA BC1 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.843 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 3.83 W/kg
SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1 W/kg
Maximum value of SAR (measured) = 2.29 W/kg

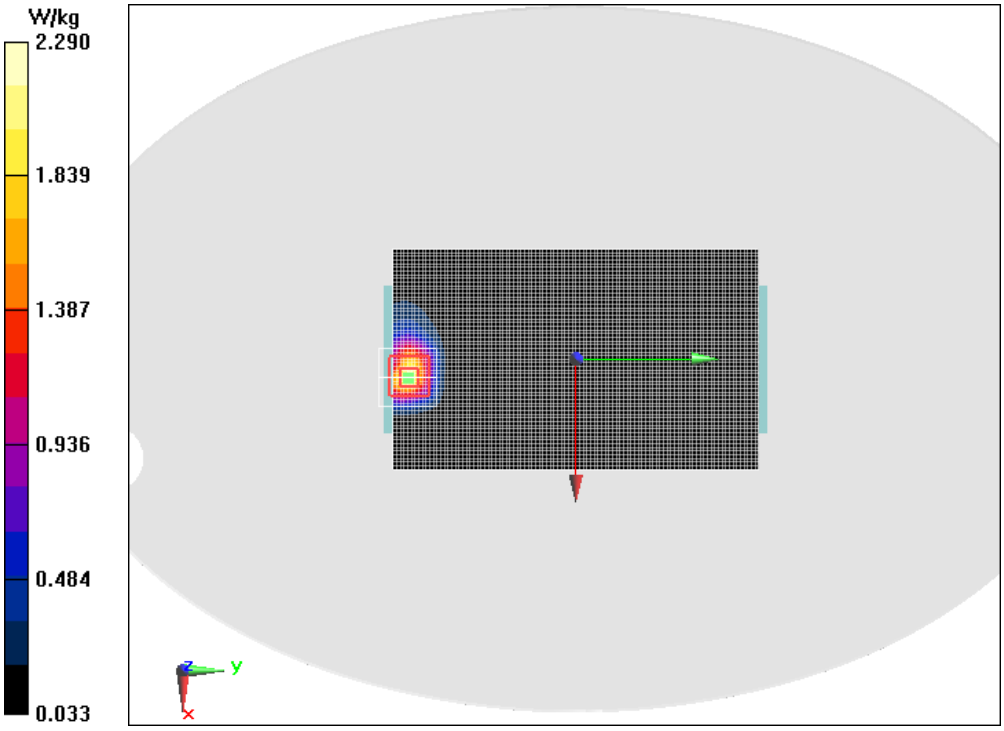


Fig.23 Wifi 11b CH11 Ground Mode

Date/Time: 2019/1/12
Electronics: DAE4 Sn1244
Medium parameters used: f = 2462 MHz; σ = 1.937 S/m; ε_r = 50.08; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: Wifi 2450 2450MHz; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.41, 4.41, 4.41); Calibrated: 9/4/2018
Wifi 11b CH11 Ground Mode/Area Scan (61x81x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0885 W/kg
Wifi 11b CH11 Ground Mode/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.782 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.309 W/kg
SAR(1 g) = 0.143 W/kg; SAR(10 g) = 0.060 W/kg
Maximum of SAR (measured) = 0.152 W/kg

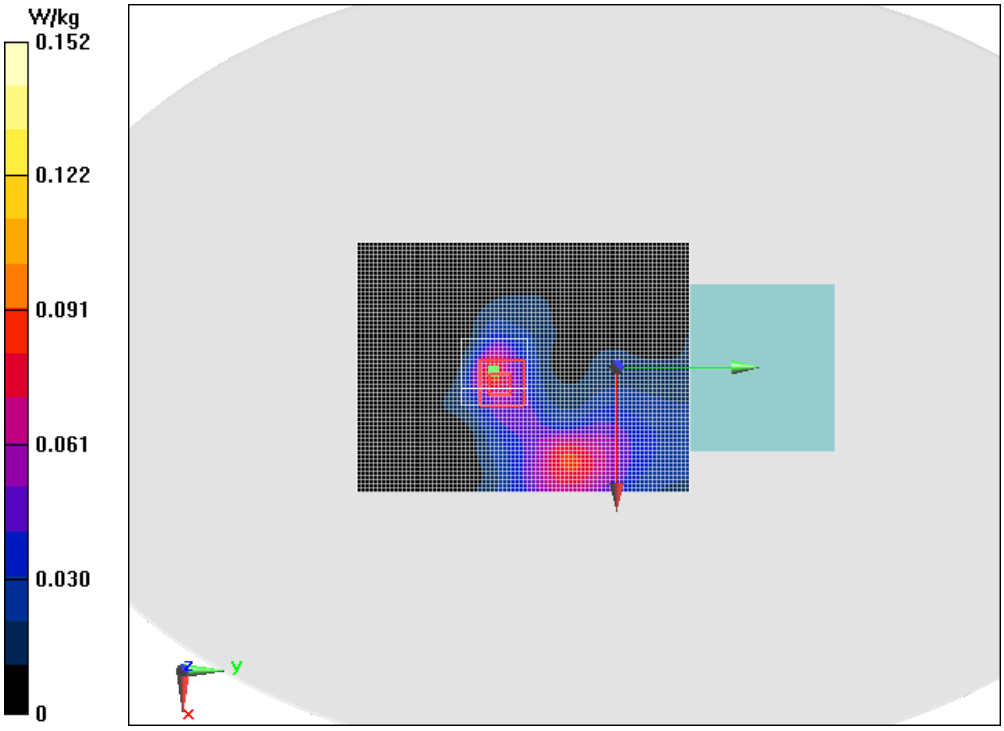
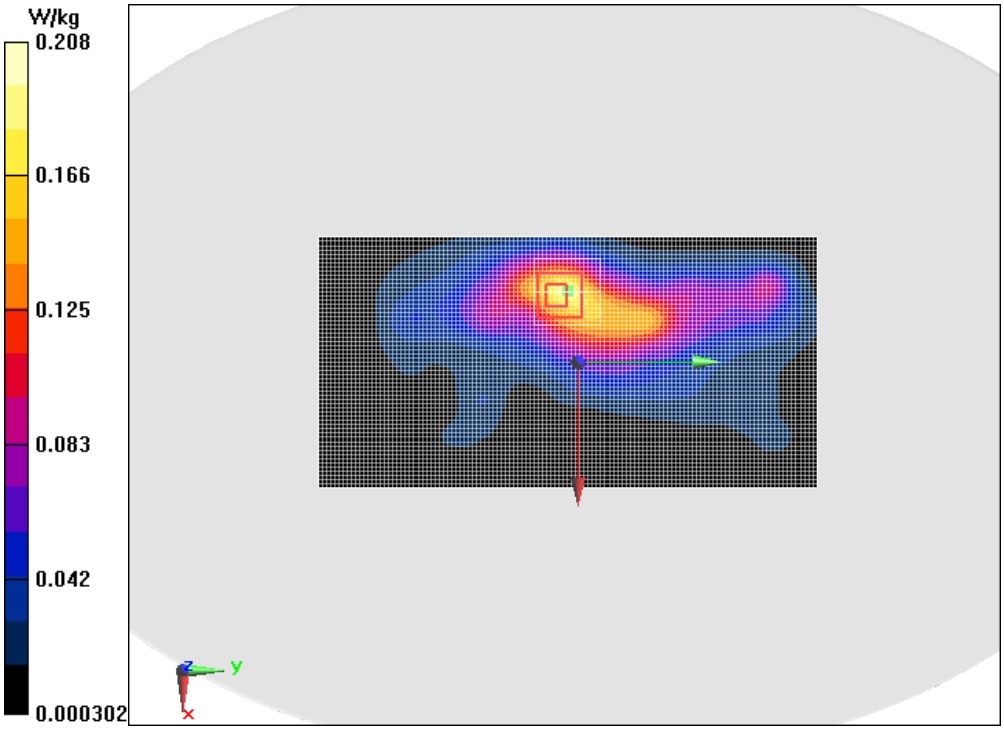


Fig.24 Wifi 11b CH11 Phantom Mode

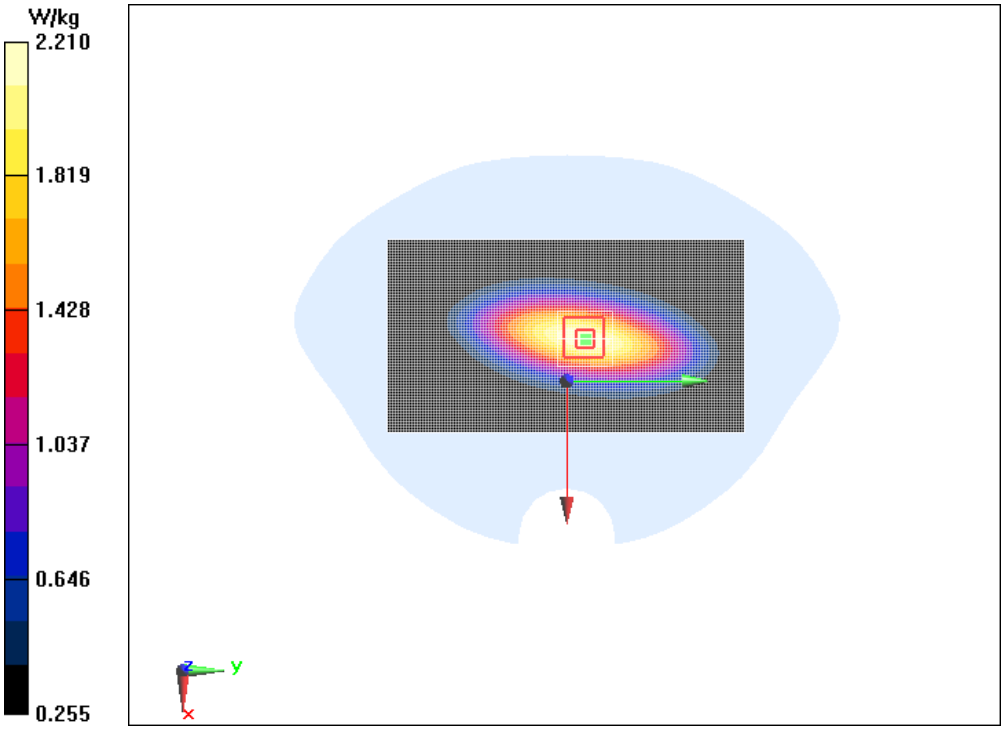
Date/Time: 2019/1/12
Electronics: DAE4 Sn1244
Medium parameters used: f = 2462 MHz; σ = 1.937 S/m; ε_r = 50.08; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: Wifi 2450 2450MHz; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.41, 4.41, 4.41); Calibrated: 9/4/2018
Wifi 11B CH11 Phantom Mode/Area Scan (61x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.190 W/kg
Wifi 11B CH11 Phantom Mode/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.978 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.361 W/kg
SAR(1 g) = 0.192 W/kg; SAR(10 g) = 0.103 W/kg
Maximum value of SAR (measured) = 0.208 W/kg



ANNEX B. System Validation Results

Body 750MHz

Date/Time: 2019/1/11
Electronics: DAE4 Sn1244
Medium parameters used: f = 750 MHz; σ = 0.916 S/m; ε_r = 57.721; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CW 850MHz; Frequency: 750 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.53, 6.53, 6.53); Calibrated: 9/4/2018
System Validation 2 2/Area Scan (71x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 2.21 W/kg
System Validation 2 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.36 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.97 W/kg
SAR(1 g) = 2.06 W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.21 W/kg

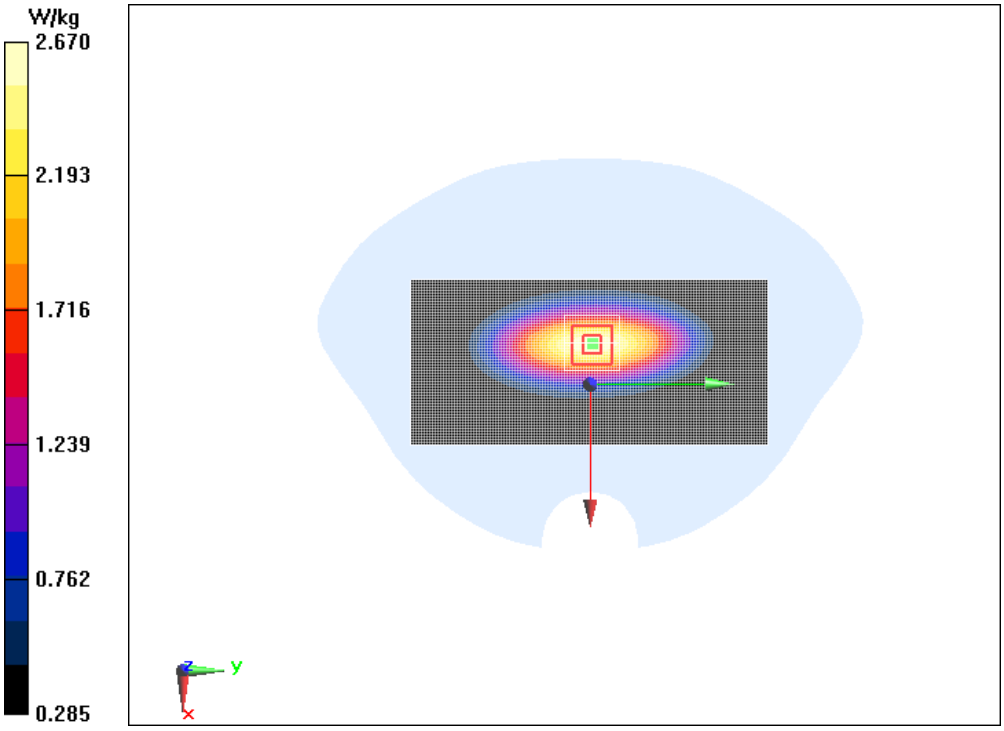


Body 835MHz

Date/Time: 2019/1/10
Electronics: DAE4 Sn1244
Medium parameters used: f = 835 MHz; σ = 0.998 S/m; ε_r = 56.731; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CW 850MHz; Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.34, 6.34, 6.34); Calibrated: 9/4/2018

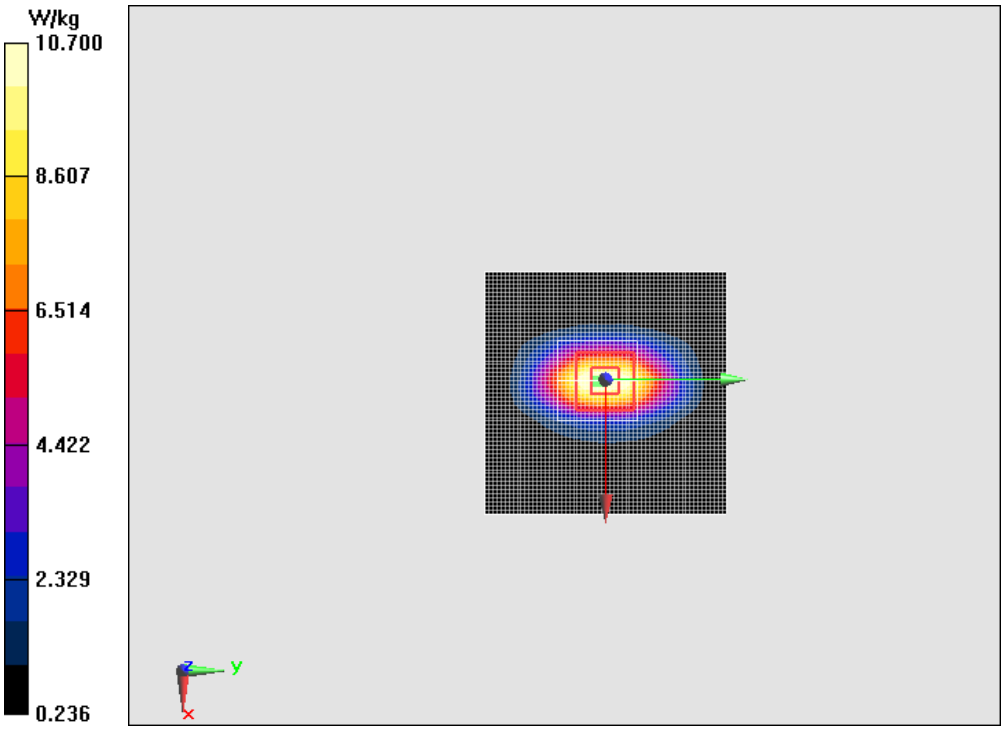
System Validation/Area Scan (61x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 2.65 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.50 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.66 W/kg
Maximum value of SAR (measured) = 2.67 W/kg



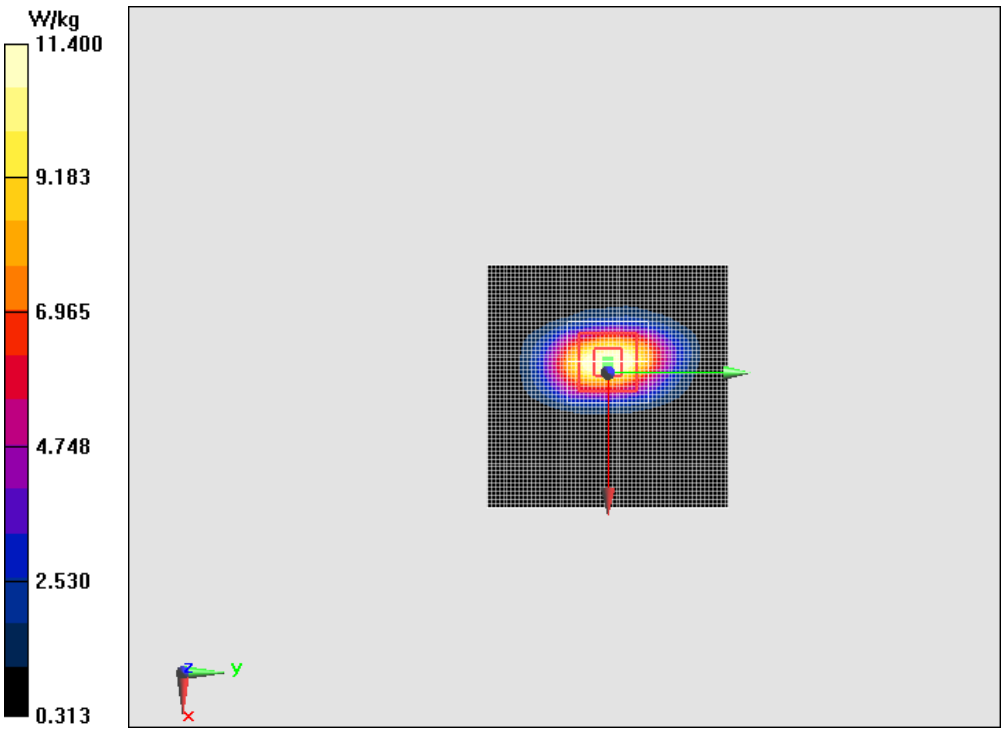
Body 1750MHz

Date/Time: 2019/1/4
Electronics: DAE4 Sn1244
Medium: Body 1800MHz
Medium parameters used: f = 1750 MHz; σ = 1.426 S/m; ε_r = 55.385; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CW 1800MHz; Frequency: 1750 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.99, 4.99, 4.99); Calibrated: 9/4/2018
System check Validation/Area Scan (61x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 11.1 W/kg
System check Validation/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.54 V/m; Power Drift = -0.32 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 9.63 W/kg; SAR(10 g) = 5.14 W/kg
Maximum value of SAR (measured) = 10.7 W/kg



Body 1900MHz

Date/Time: 2019/1/9
Electronics: DAE4 Sn1244
Medium parameters used: f = 1900 MHz; σ = 1.556 S/m; ε_r = 52.078; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CW 1900MHz; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.77, 4.77, 4.77); Calibrated: 9/4/2018
System check Validation 2/Area Scan (61x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 12.3 W/kg
System check Validation 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.59 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 10 W/kg; SAR(10 g) = 5.34 W/kg
Maximum value of SAR (measured) = 11.4 W/kg

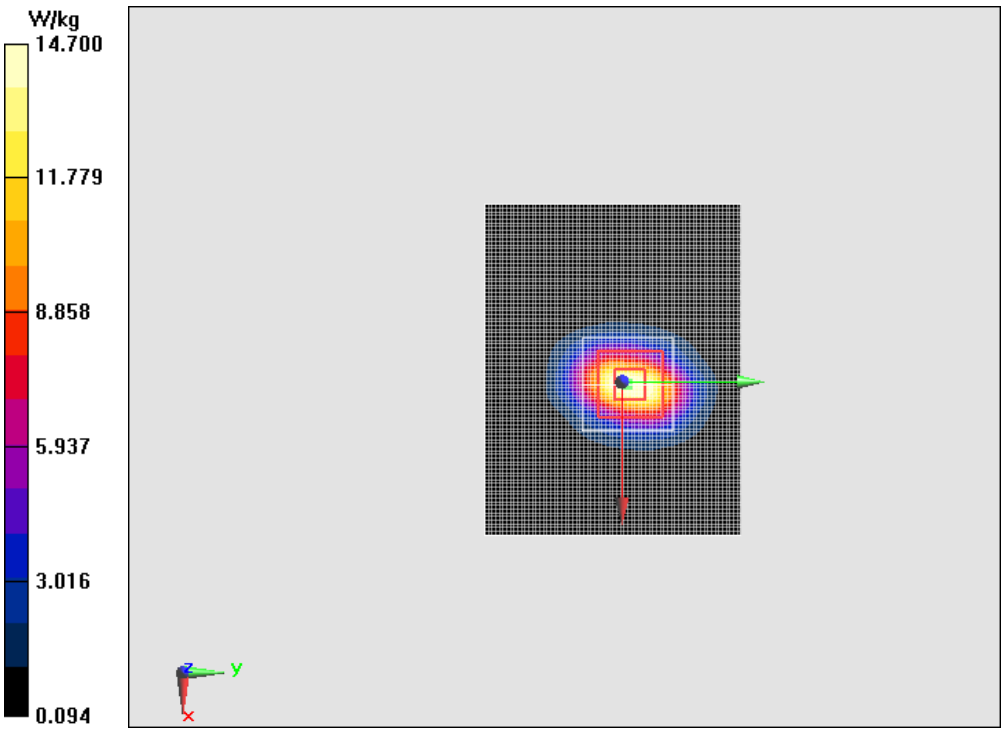


Body 2450MHz

Date/Time: 2019/1/12
Electronics: DAE4 Sn1244
Medium parameters used: f = 2450 MHz; σ = 1.922 S/m; ε_r = 50.131; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CW 2450MHz; Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.41, 4.41, 4.41); Calibrated: 9/4/2018

System Validation/Area Scan (91x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 14.9 W/kg

System Validation/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.88 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 27.0 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.94 W/kg
Maximum value of SAR (measured) = 14.7 W/kg

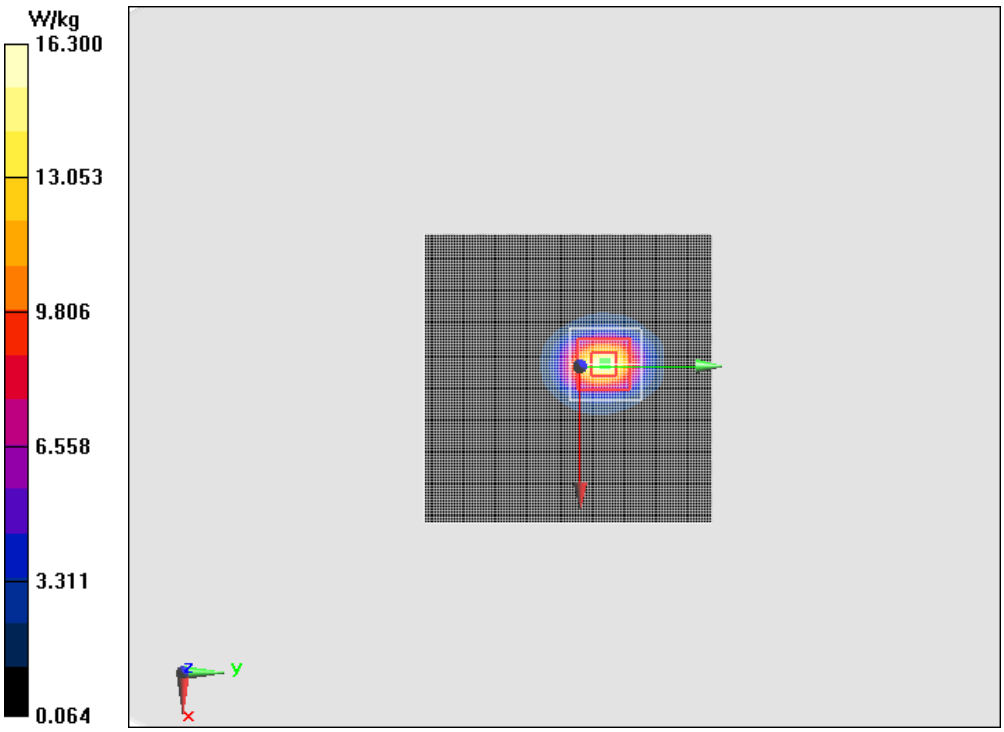


Body 2600MHz

Date/Time: 2019/1/5
Electronics: DAE4 Sn1244
Medium parameters used: f = 2600 MHz; σ = 2.112 S/m; ε_r = 54.37; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: CW 2600MHz; Frequency: 2600 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.19, 4.19, 4.19); Calibrated: 9/4/2018

Body 2600MHz/Area Scan (101x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 16.8 W/kg

Body 2600MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.23 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.2 W/kg
Maximum value of SAR (measured) = 16.3 W/kg



ANNEX C. System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

Table C.1: System Validation Part 1

System No.	Probe SN.	Liquid name	Validation date	Frequency point	**Permittivity ε**	**Conductivity σ (S/m)**
1	3252	Body 750MHz	2019/1/11	750 MHz	57.721	0.916
2	3252	Body 835MHz	2019/1/10	835 MHz	56.731	0.998
3	3252	Body 1750MHz	2019/1/4	1800 MHz	55.227	1.479
4	3252	Body 1900MHz	2019/1/9	1900 MHz	52.078	1.556
5	3252	Body 2450MHz	2019/1/12	2450 MHz	50.131	1.922
6	3252	Body 2600MHz	2019/1/5	2600 MHz	54.370	2.112

Table F.2: System Validation Part 2

CW Validation	Sensitivity	PASS	PASS
	Probe linearity	PASS	PASS
	Probe Isotropy	PASS	PASS
Mod Validation	MOD.type	GMSK	GMSK
	MOD.type	OFDM	OFDM
	Duty factor	PASS	PASS
	PAR	PASS	PASS

ANNEX D. Calibration Certification

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中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client : ECIT Certificate No: Z18-60529

CALIBRATION CERTIFICATE

Object	DAE4 - SN: 1244
Calibration Procedure(s)	FF-Z11-002-01 Calibration Procedure for the Data Acquisition Electronics (DAEx)
Calibration date:	December 03, 2018

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
Process Calibrator 753	1971018	20-Jun-18 (CTTL, No.J18X05034)	June-19

	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: December 05, 2018

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Glossary:

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

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DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100...+300 mV
Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.818 ± 0.15% (k=2)	403.555 ± 0.15% (k=2)	404.470 ± 0.15% (k=2)
Low Range	3.95395 ± 0.7% (k=2)	3.97087 ± 0.7% (k=2)	3.97994 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	22.5° ± 1 °

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Client ECIT Certificate No: Z18-60343

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3252

Calibration Procedure(s) FF-Z11-004-01
Calibration Procedures for Dosimetric E-field Probes

Calibration date: September 04, 2018

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	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Power sensor NRP-Z91	101547	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Power sensor NRP-Z91	101548	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Reference10dBAttenuator	18N50W-10dB	09-Feb-18(CTTL, No.J18X01133)	Feb-20
Reference20dBAttenuator	18N50W-20dB	09-Feb-18(CTTL, No.J18X01132)	Feb-20
Reference Probe EX3DV4	SN 3846	25-Jan-18(SPEAG,No.EX3-3846_Jan18)	Jan-19
DAE4	SN 777	15-Dec-17(SPEAG, No.DAE4-777_Dec17)	Dec -18
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	21-Jun-18 (CTTL, No.J18X05033)	Jun-19
Network Analyzer E5071C	MY46110673	14-Jan-18 (CTTL, No.J18X00561)	Jan -19

	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: September 06, 2018

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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).

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Probe ES3DV3

SN: 3252

Calibrated: September 04, 2018

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3252

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)²)[A]	1.29	1.35	1.33	±10.0%
DCP(mV)[B]	102.7	105.4	103.6	

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	268.8	±2.5%
		Y	0.0	0.0	1.0		276.1	
		Z	0.0	0.0	1.0		278.3	

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 E^2-field uncertainty inside TSL (see Page 5 and Page 6).
[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.

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3252

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	6.51	6.51	6.51	0.40	1.42	±12.1%
835	41.5	0.90	6.36	6.36	6.36	0.40	1.56	±12.1%
900	41.5	0.97	6.31	6.31	6.31	0.45	1.48	±12.1%
1750	40.1	1.37	5.39	5.39	5.39	0.61	1.28	±12.1%
1900	40.0	1.40	5.18	5.18	5.18	0.67	1.26	±12.1%
2000	40.0	1.40	5.17	5.17	5.17	0.71	1.20	±12.1%
2300	39.5	1.67	4.92	4.92	4.92	0.90	1.14	±12.1%
2450	39.2	1.80	4.74	4.74	4.74	0.90	1.15	±12.1%
2600	39.0	1.96	4.46	4.46	4.46	0.72	1.37	±12.1%

[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.

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3252

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	6.53	6.53	6.53	0.40	1.50	±12.1%
835	55.2	0.97	6.34	6.34	6.34	0.42	1.58	±12.1%
900	55.0	1.05	6.29	6.29	6.29	0.47	1.51	±12.1%
1750	53.4	1.49	4.99	4.99	4.99	0.65	1.28	±12.1%
1900	53.3	1.52	4.77	4.77	4.77	0.75	1.23	±12.1%
2000	53.3	1.52	4.95	4.95	4.95	0.67	1.28	±12.1%
2300	52.9	1.81	4.63	4.63	4.63	0.90	1.15	±12.1%
2450	52.7	1.95	4.41	4.41	4.41	0.90	1.17	±12.1%
2600	52.5	2.16	4.19	4.19	4.19	0.90	1.15	±12.1%

[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.

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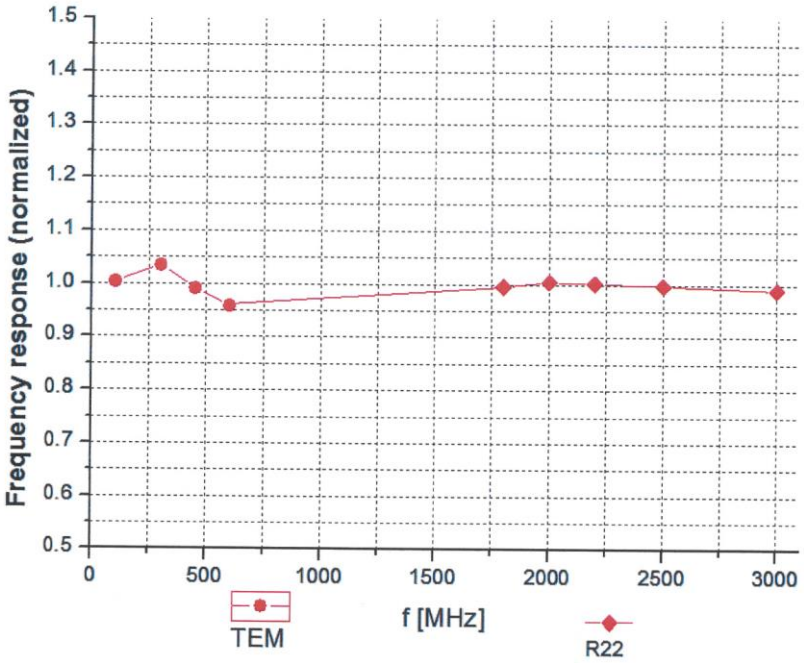
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



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

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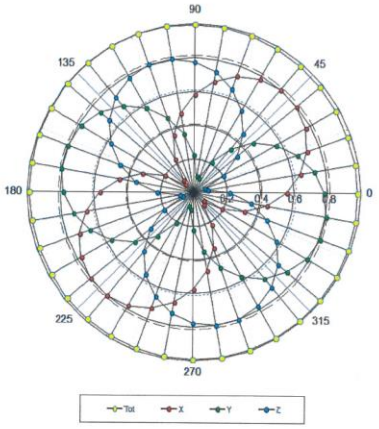
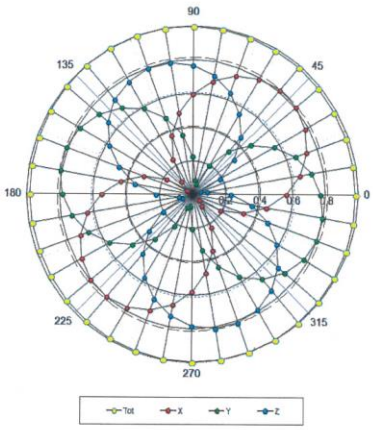
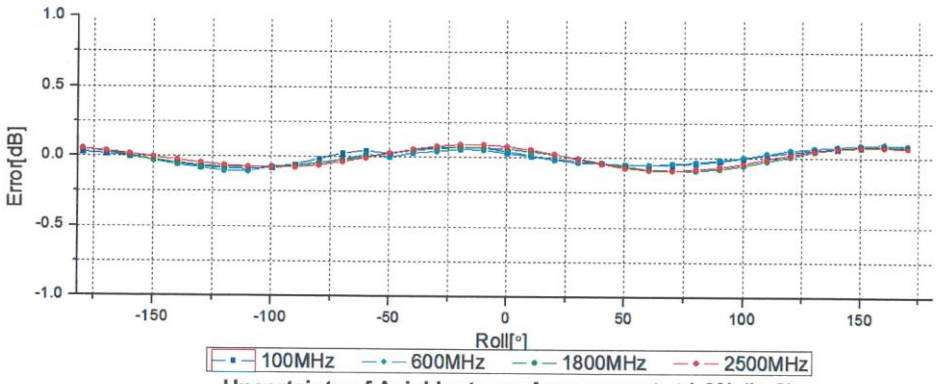
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





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

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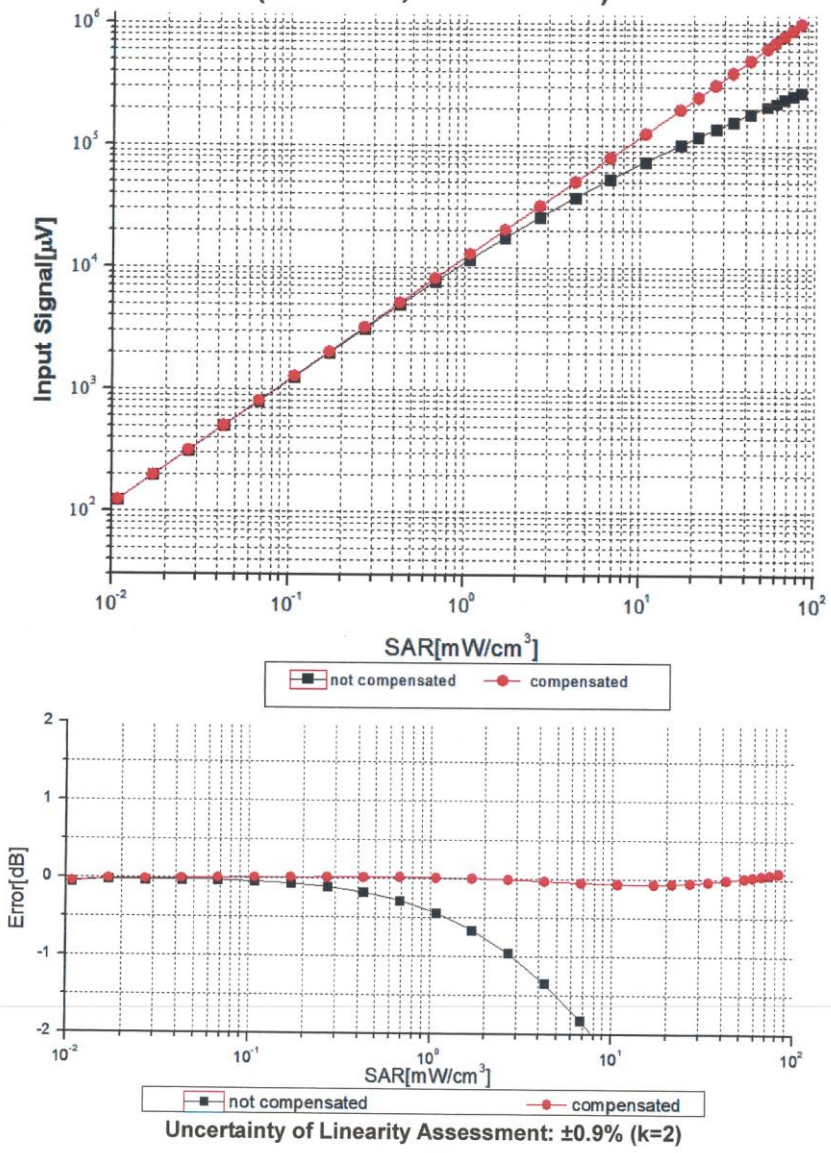
Dynamic Range f(SAR$_{head}$)
(TEM cell, f = 900 MHz)



Uncertainty of Linearity Assessment: ±0.9% (k=2)

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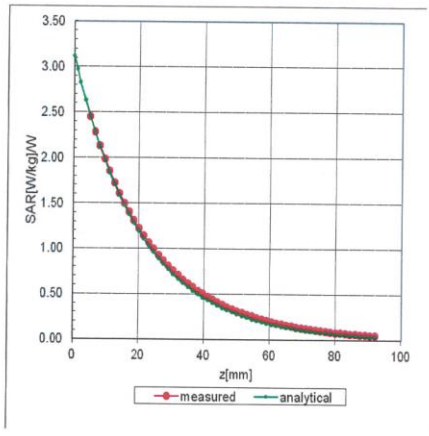
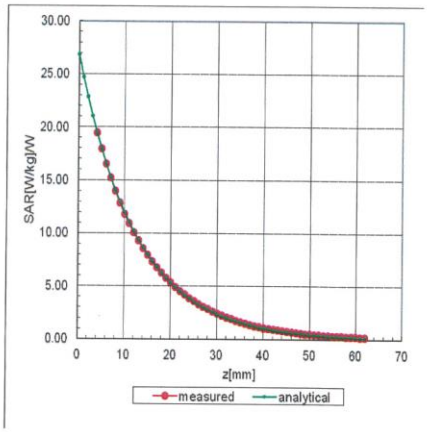
Conversion Factor Assessment

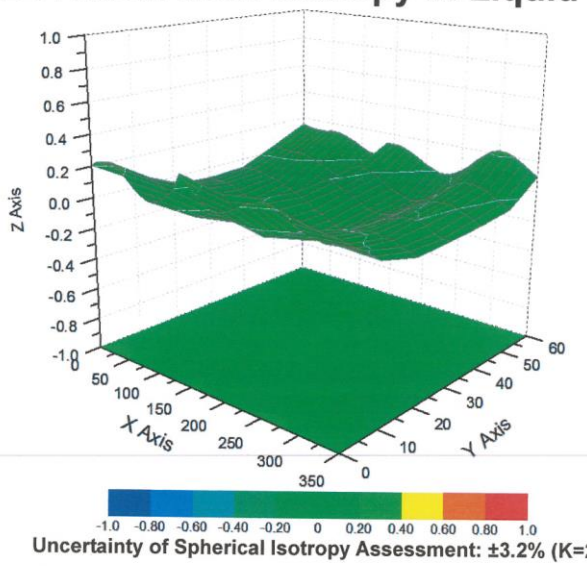
f=750 MHz, WGLS R9(H_convF)



f=1750 MHz, WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (K=2)

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3252

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	131.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	10mm
Tip Diameter	4mm
Probe Tip to Sensor X Calibration Point	2mm
Probe Tip to Sensor Y Calibration Point	2mm
Probe Tip to Sensor Z Calibration Point	2mm
Recommended Measurement Distance from Surface	3mm

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CALIBRATION
CNAS L0570

Client ECIT Certificate No: Z18-60424

CALIBRATION CERTIFICATE

Object D750V3 - SN: 1144

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: October 26, 2018

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 NRVD	102083	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Power sensor NRV-Z5	100542	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Reference Probe EX3DV4	SN 7514	27-Aug-18(SPEAG,No.EX3-7514_Aug18)	Aug-19
DAE4	SN 1555	20-Aug-18(SPEAG,No.DAE4-1555_Aug18)	Aug-19
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
NetworkAnalyzer E5071C	MY46110673	24-Jan-18 (CTTL, No.J18X00561)	Jan-19

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

Issued: October 29, 2018

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

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

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 assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.10.2.1495
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.1 ± 6 %	0.88 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.11 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.50 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.39 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.59 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.6 ± 6 %	0.93 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.09 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.55 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.40 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.70 mW /g ±18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.5Ω+ 0.45jΩ
Return Loss	- 27.4dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.7Ω- 2.47jΩ
Return Loss	- 32.1dB

General Antenna Parameters and Design

Electrical Delay (one direction)	0.897 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