Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.3 ± 6 %	2.05 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**57.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.48 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.5 W/kg ± 16.5 % (k=2)**

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

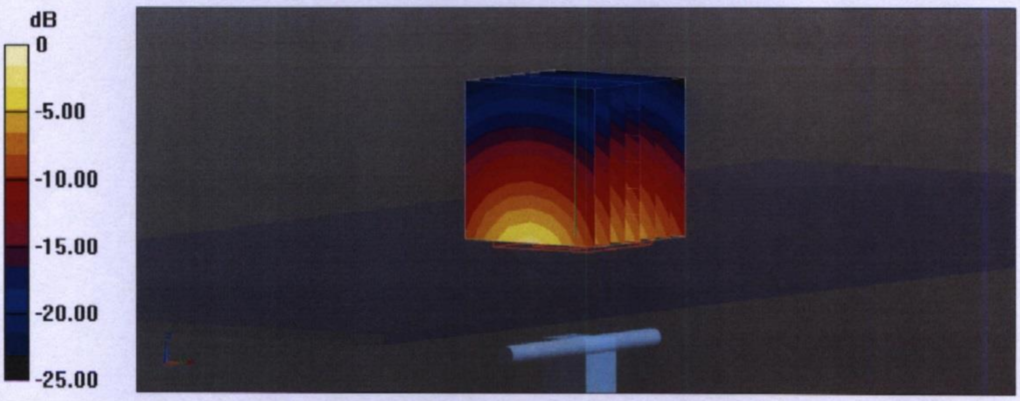
Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.05 S/m; ε_r = 37.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

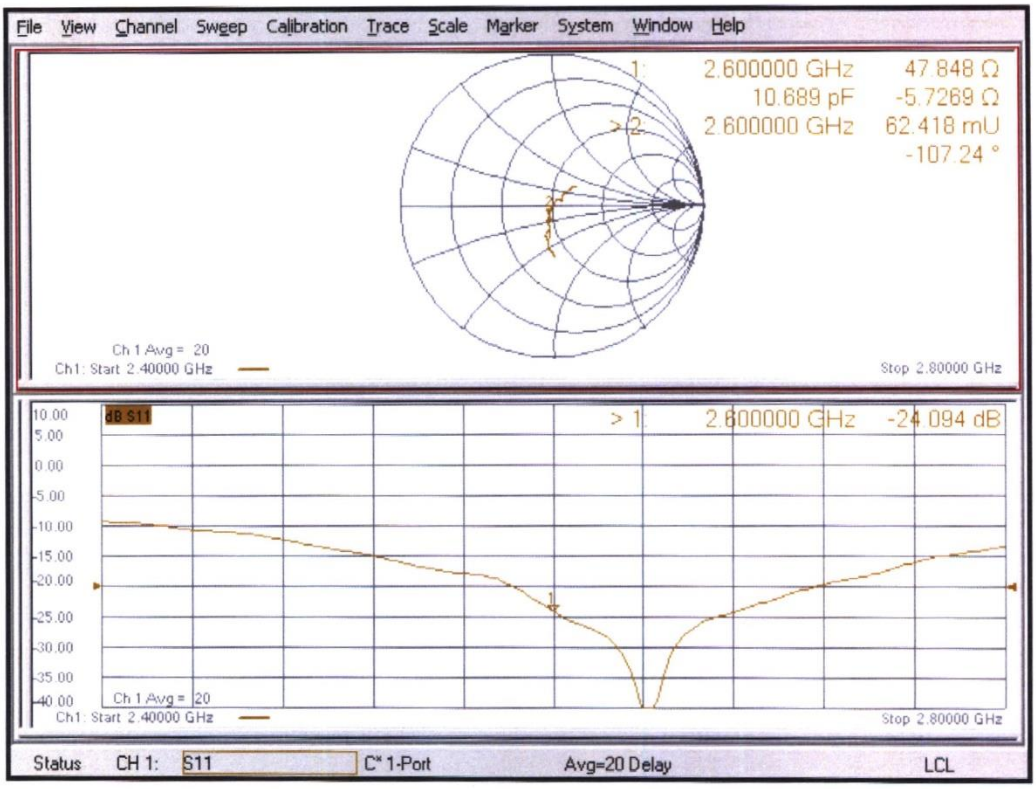
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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



Certificate No: D2600V2-1012_Jul21 Page 6 of 6

ANNEX I SPOT CHECK

I.1 Dielectric Performance and System Validation

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

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2022-1-23	Head	2450 MHz	41.6	6.12%	1.963	9.06%
2022-1-24	Head	2600 MHz	41.19	5.59%	2.109	7.60%

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
2022-1-23	2450 MHz	24.9	53.3	24.6	52.8	-1.20%	-0.86%
2022-1-24	2600 MHz	25.5	57.1	25.1	56.5	-1.49%	-1.09%

I.2 SAR test results for Spot Check

Table I.2-1: Spot Check results

Band	Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
	Ch.	MHz									
WIFI2.4G	11	2462	Right Tilt	Fig.I-1	16.58	17	0.263	**0.29**	0.635	**0.70**	-0.03
LTE B38	38150	2610	Bottom 10mm	Fig.I-2	21.92	22.5	0.318	**0.36**	0.682	**0.78**	-0.11

I.3 Reported SAR Comparison

Table I.3-1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Reported SAR 1g (W/Kg)-Original	Reported SAR 1g (W/Kg)-Spot check
Head	WIFI2.4G	**0.81**	**0.70**
Body	LTE B38	**1.24**	**0.78**

Note: All the spot check results are less than the original result. So it shares all the original results.

I.4 Graph Results

WLAN2450_CH11 Right Tilt
Date: 1/23/2022
Electronics: DAE4 Sn1331
Medium: head 2450 MHz
Medium parameters used: f = 2462 MHz; σ = 1.905 S/m; ε_r = 40.974;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WLAN2450 2462 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.35,7.35,7.35)

Area Scan (101x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.03 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.83 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.635 W/kg; SAR(10 g) = 0.263 W/kg
Maximum value of SAR (measured) = 1.13 W/kg

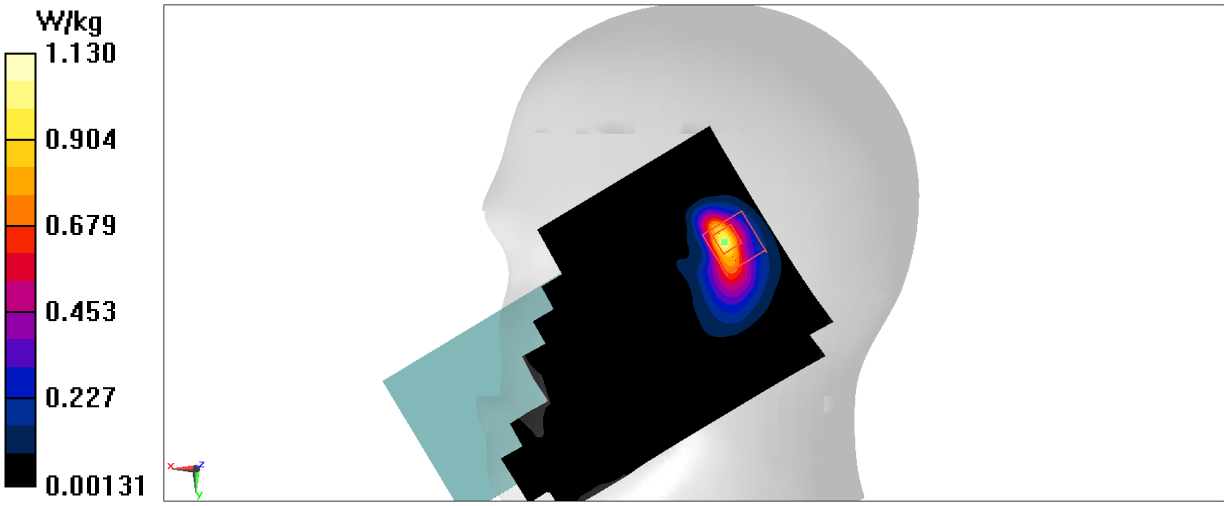
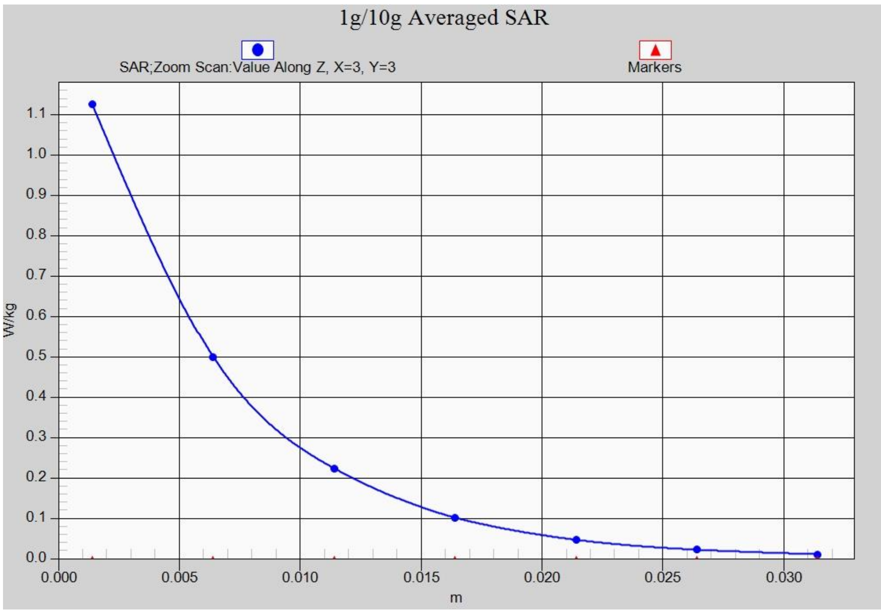


Fig.I-1



Z-Scan at power reference point (WIFI2.4G)

LTE2600-TDD38_CH38150 Bottom 10mm
Date: 1/24/2022
Electronics: DAE4 Sn1331
Medium: head 2600 MHz
Medium parameters used: f = 2610 MHz; σ = 2.039 S/m; ε_r = 40.748;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE2600-TDD38 2610 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 – SN7548 ConvF(7.11,7.11,7.11)

Area Scan (101x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.17 W/kg

Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.60 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.682 W/kg; SAR(10 g) = 0.318 W/kg
Maximum value of SAR (measured) = 1.11 W/kg

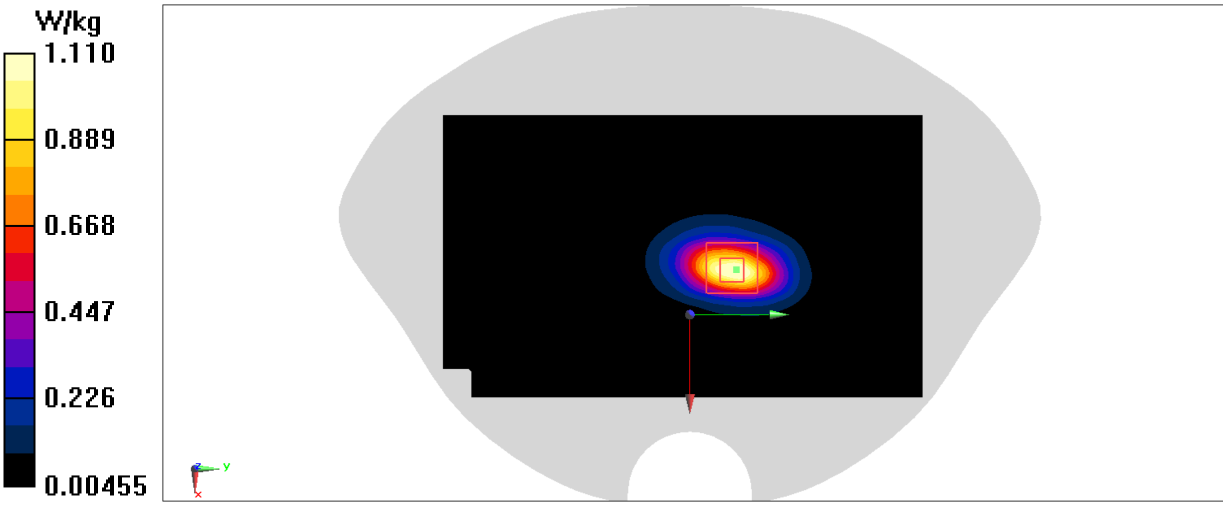
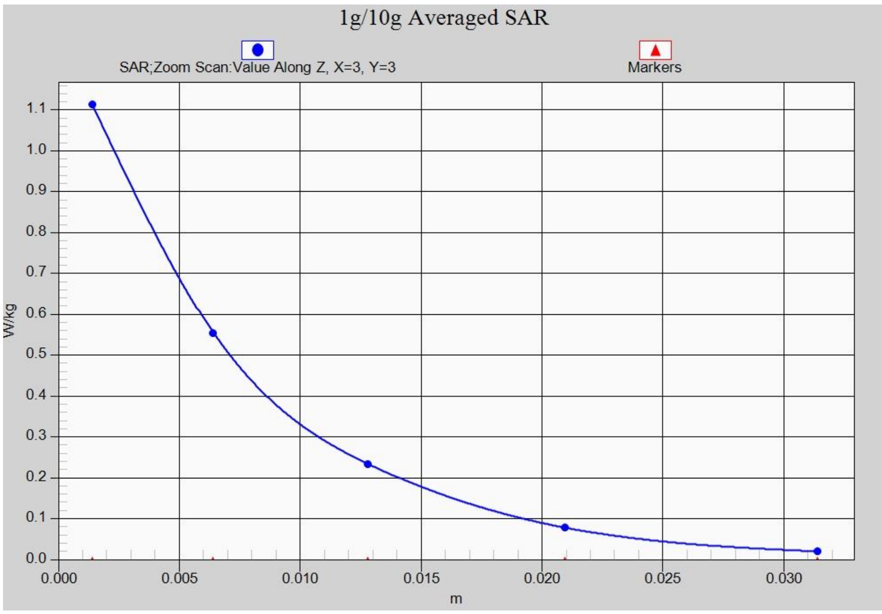


Fig.I-2



Z-Scan at power reference point (LTE B38)

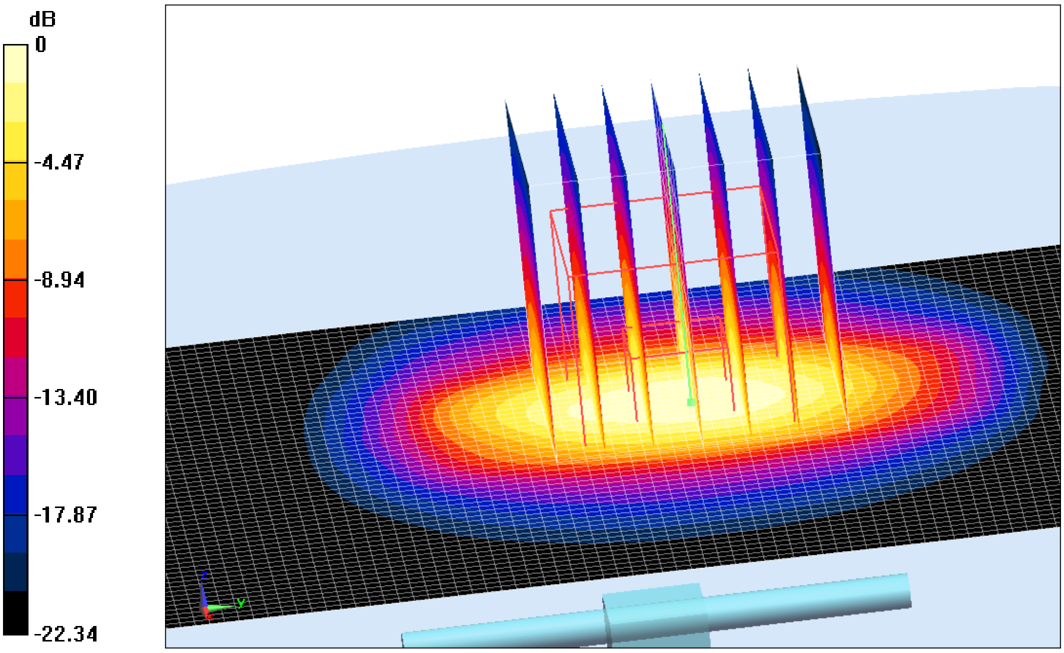
I.5 System Verification Results

2450MHz

Date: 2022-1-23
Electronics: DAE4 Sn1331
Medium: Head 2450MHz
Medium parameters used: f = 2450MHz; σ =1.963 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.2°C Liquid Temperature: 22°C
Communication System: CW Frequency: 2450MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.35,7.35,7.35)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =114.47 V/m; Power Drift = -0.11 dB
Fast SAR: SAR(1 g) = 13.32 W/kg; SAR(10 g) = 6.23 W/kg
Maximum value of SAR (interpolated) = 22.36 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =114.47 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 25.43W/kg
SAR(1 g) = 13.21 W/kg; SAR(10 g) = 6.15W/kg
Maximum value of SAR (measured) = 21.23 W/kg



0 dB = 21.23 W/kg = 13.27 dB W/kg

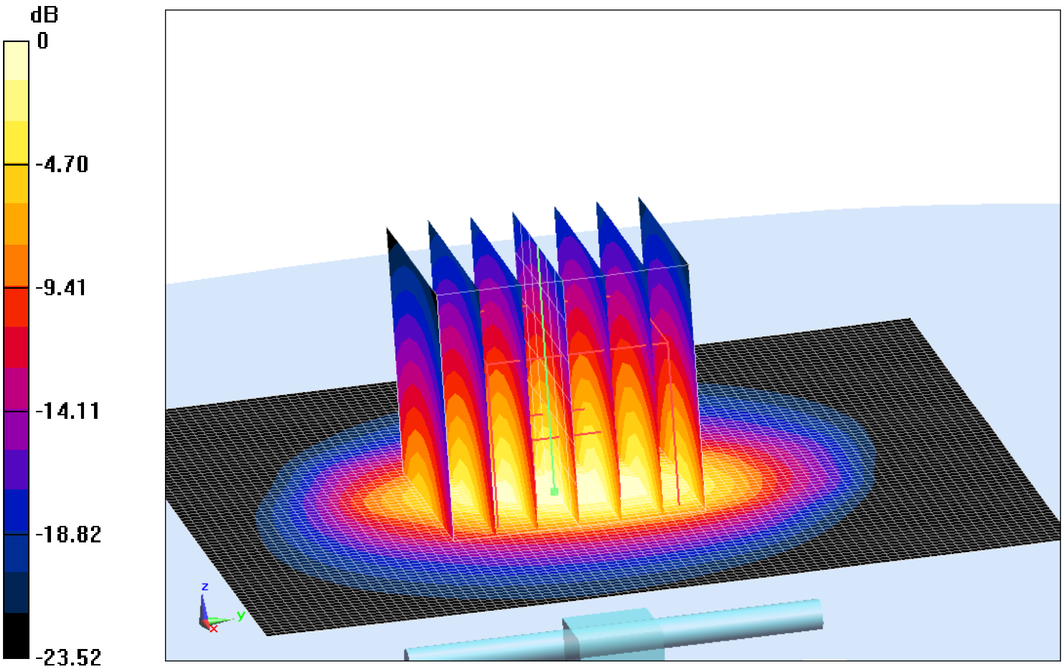
Fig.I.5-1 validation 2450MHz 250mW

2600MHz

Date: 2022-1-24
Electronics: DAE4 Sn1331
Medium: Head 2600MHz
Medium parameters used: f = 2600MHz; σ =2.109 mho/m; ε_r = 41.19; ρ = 1000 kg/m^3
Ambient Temperature: 22.2°C Liquid Temperature: 22°C
Communication System: CW Frequency: 2600MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.11,7.11,7.11)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =120.85 V/m; Power Drift = -0.17 dB
Fast SAR: SAR(1 g) = 14.35 W/kg; SAR(10 g) = 6.36 W/kg
Maximum value of SAR (interpolated) = 24.79 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =120.85 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 29.69W/kg
SAR(1 g) = 14.12 W/kg; SAR(10 g) = 6.28 W/kg
Maximum value of SAR (measured) = 25.25 W/kg



0 dB = 25.25 W/kg = 14.02 dB W/kg

Fig.I.5-2 validation 2600MHz 250mW

ANNEX J Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP® ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-09-29 through 2022-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program