Certificate#4897.01

TEST REPORT

REPORT NUMBER: B22W00685-SAR-Rev1

ON

Type of Equipment:	GSM/UMTS/LTE Mobile Phone
Type of Designation:	mobile phone(touchscreen)
Manufacturer:	TCL Communication Ltd.
FCC ID:	2ACCJH166

ACCORDING TO

ANSI C95.1-1992

IEEE 1528–2013

Chongqing Academy of Information and Communication Technology

Month date, year

Jul 5, 2022

Signature

Xiang Luoyong

Director

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.

Revision Version

Report Number	Revision	Date	Memo
B22W00685-SAR	00	2022-06-14	Initial creation of test report
B22W00685-SAR-Rev1	01	2022-07-05	First change of test report

Note: For B22W00685-SAR-Rev1report，add the conducted power measurement results of LTE Carrier Aggregation (CA) in E.2.1 chapter from 210 to 212 page.

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1. Test Laboratory

1.1. Testing Location

Company Name:	Chongqing Academy of Information andCommunications Technology
Address:	No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

1.2. Testing Environment

Normal Temperature:	18-25℃
Relative Humidity:	30-70%
Ambient noise & Reflection:	< 0.012 W/kg

1.3. Project Data

Testing Start Date:	2022-05-19
Testing End Date:	2022-06-05

1.4. Signature

付博皓 — 2022-7-5

Fu Bohao
(Prepared this test report) — **Date**

王丽丽 — 2022-7-5

Wang Lili
(Reviewed this test report) — **Date**

向罗勇 — 2022-7-5

Xiang Luoyong
Director of the laboratory
(Approved this test report) — **Date**

2. Statement of Compliance

This EUT is a variant product and the report of original sample is No.B22W00684-SAR. For Newly added frequency bands， we do full test， and we also do the spot check on highest value point per modulation of the original report for head and body respectively. The results of spot check and full test are presented in the ANNEX E.

The maximum results of Specific Absorption Rate (SAR) found during testing for **TCL** Communication Ltd. GSM/UMTS/LTE mobile phone T501L are as follows:

Table 2.1: Highest Reported SAR (1g)

Technology Band	Head	Hotspot	Body worn
GSM850	0.22	0.75	0.75
GSM1900	0.15	0.43	0.29
WCDMA Band2	0.55	0.62	0.48
WCDMA Band4	0.41	0.76	0.53
WCDMA Band5	**0.81**	0.78	0.78
LTE Band2	0.43	0.78	0.42
LTE Band5	0.79	0.78	0.78
LTE Band12	0.48	0.62	0.62
LTE Band13	0.58	**0.88**	**0.88**
LTE Band25	0.26	0.75	0.39
LTE Band26	0.78	0.59	0.59
LTE Band41(PC2)	0.06	0.82	0.42
LTE Band41(PC3)	0.06	0.65	0.40
LTE Band66	0.33	0.55	0.49
LTE Band71	0.30	0.40	0.40
WLAN 2.4GHz	0.55	0.23	0.11
BT 2.4GHz	0.06	0.02	0.01

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/kg as averaged over any 1g tissue according to the ANSI C95.1-1992.
For body operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 10/15 mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.
The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.
The measurement together with the test system set-up is described in Chapter 7 of this test report.
A detailed description of the equipment under test can be found in chapter 4 of this test report.
The highest reported SAR value is obtained at the case of (Table 2.1), and the values are:

Head: 0.81 W/kg (1g)

Body: 0.88 W/kg (1g)

Remark:

This device supports both LTE Band4 and Band66.Since the supported frequency span for LTE Band4 falls completely within the supports frequency span for LTE Band66, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE Band66.

Table 2.2: The sum of SAR values for Main antenna + WiFi-2.4G (1g)

Position		**Main antenna （W/kg）**	**WiFi-2.4G （W/kg）**	**Sum （W/kg）**
Highest SAR value for Head	Right head, Cheek (WCDMA1900)	0.55	0.55	1.10
Highest SAR value for Body	Rear 10mm (LTE B2)	0.78	0.23	1.01

Table 2.3: The sum of SAR values for main antenna and BT (1g)

Position		**Main antenna （W/kg）**	**BT （W/kg）**	**Sum （W/kg）**
Maximum reported SAR value for Head	Left head, Cheek (WCDMA850)	0.81	0.03	0.84
Maximum reported SAR value for Body	Right 10mm (LTE B13)	0.88	\	0.88

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

According to the above tables, the highest sum of reported SAR values is 1.10 W/kg (1g). The detail for simultaneous transmission consideration is described in ANNEX E2.2

3. Client Information

3.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Telephone:	+86 755 3664 5759
Fax:	+86 755 3661 2000-81722
Email:	peter.yang@tcl.com
Contact Person:	Peter yang

3.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Telephone:	+86 755 3664 5759
Fax:	+86 755 3661 2000-81722
Email:	peter.yang@tcl.com
Contact Person:	Peter yang

4. Equipment Under Test (EUT) and Ancillary Equipment (AE)

4.1. About EUT

Description:	GSM/UMTS/LTE Mobile Phone
Model name:	T501L
Operating mode(s):	GSM850/900/1800/1900, WCDMA850/1700/1900 LTE Band 2/4/5/12/13/25/26/41(PC2)/41(PC3)/66/71 BT, Wi-Fi(2.4G)
Tested Tx Frequency:	824 – 849 MHz (GSM 850)
	1850 – 1910 MHz (GSM 1900)
	824 – 849 MHz (WCDMA 850 Band V)
	1712.4 – 1752.6 MHz (WCDMA1700 Band IV)
	1850 – 1910 MHz (WCDMA1900 Band II)
	1850 – 1909.9 MHz (LTE Band 2)
	824 – 848.9 MHz (LTE Band 5)
	699.7 – 715.3 MHz (LTE Band 12)
	777~786.9 MHz (LTE Band 13)
	1850~1915 MHz (LTE Band 25)
	814~848.9 MHz (LTE Band 26)
	2496~2689.9 MHz (LTE Band 41 PC2)
	2496~2689.9 MHz (LTE Band 41 PC3)
	1710.7 –1779.3 MHz (LTE Band 66)
	663~697.9 (LTE Band 71)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	2400 – 2483.5 MHz (Bluetooth)
GPRS/EGPRS Multislot Class:	12
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Embedded antenna
Hotspot mode:	Support

4.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	**Date of receipt**
EUT1	016256000010082	03	FS38	2022-05-16
EUT2	016256000010025	03	FS38	2022-05-16

*EUT ID: is used to identify the test sample in the lab internally.

4.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	TLi028C7	CAB2880021C7	VEKEN
AE2	Battery	TLi028C1	CAB2880006C1	BYD

*AE ID: is used to identify the test sample in the lab internally.

5. Reference Documents

5.1. Applicable Limit Regulations

ANSI C95.1–1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.2. Applicable Measurement Standards

IEEE 1528–2013: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

KDB447498 D01: General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB941225 D06 Hotspot Mode SAR v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities.

KDB941225 D01 SAR test for 3G devices v03r01: SAR Measurement Procedures for 3G Devices

KDB941225 D05 SAR for LTE Devices v02r05: SAR Evaluation Considerations for LTE Devices

KDB248227 D01 802.11 Wi-Fi SAR v02r02: SAR Evaluation Procedures for IEEE 802.11 Wi-Fi Transmitters.

KDB865664 D01SAR measurement 100 MHz to 6 GHz v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz.

KDB865664 D02 RF Exposure Reporting v01r02: RF Exposure Compliance Reporting and Documentation Considerations.

6. Specific Absorption Rate (SAR)

6.1. Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled,based on a person's awareness and abilityto exercise control over his or her exposure.In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

6.2. SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ) . The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = c\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

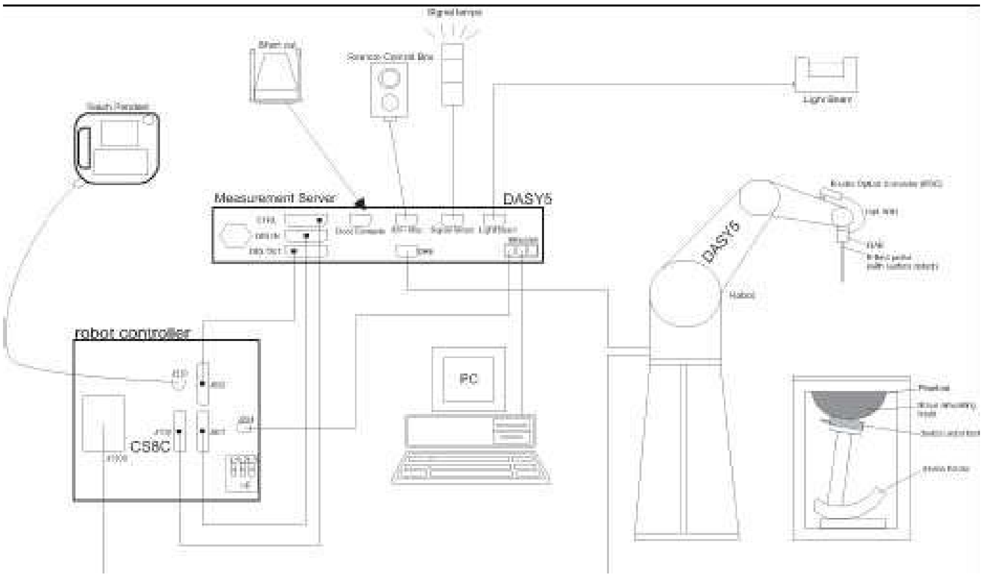
Where: σ is the conductivity of the tissue, ρ is the mass density of tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7. SAR MEASUREMENT SETUP

7.1. Measurement Set-up

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



Picture 7-1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and theDASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

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7.2. DASY5 E-field Probe System

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

Picture 7-2 Near-field Probe

Probe Specifications:

Model: EX3DV4

Frequency 650MHz — 6GHz

Calibration: In head and body simulating tissue at Frequencies from 650 up to 4900MHz

Linearity: ± 0.2dB

Dynamic Range: 10 mW/kg — 100W/kg

Probe Length: 330 mm

Probe Tip

Length: 20 mm

Body Diameter: 12 mm

Tip Diameter: 2.5mm

Tip-Center: 1 mm

Application: SAR Dosimetry Testing

Compliance tests of mobile phones

Dosimetry in strong gradient fields

Picture 7-3 E-field Probe

7.3. E-field Probe Calibration

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

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if thefrequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2..

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

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

Where:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

7.4. Other Test Equipment

7.4.1. Data Acquisition Electronics(DAE)

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

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

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

Picture7.4.1-1: DAE

7.4.2. Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

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

Picture7.4.2-1: DASY 5

7.4.3. Measurement Server

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

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

Picture 7.4.3-1: Server for DASY 5

7.4.4. Device Holder for Phantom

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

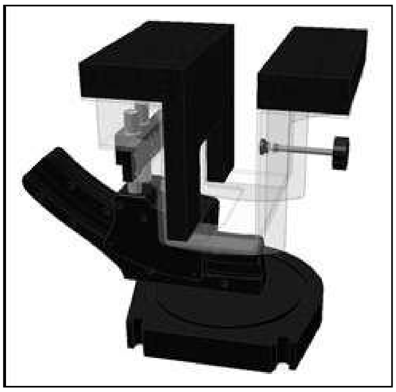
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference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

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

<Laptop Extension Kit>

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

Picture7.4.4-1: Device Holder



Picture 7.4.4-2: Laptop Extension Kit

7.4.5. Phantom

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

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

Shell Thickness: 2 ± 0. 2 mm

Filling Volume: Approx. 25 liters

Dimensions: 810 x l000 x 500 mm (H x L x W)

Available: Special

Picture 7.4.5-1: SAM Twin Phantom

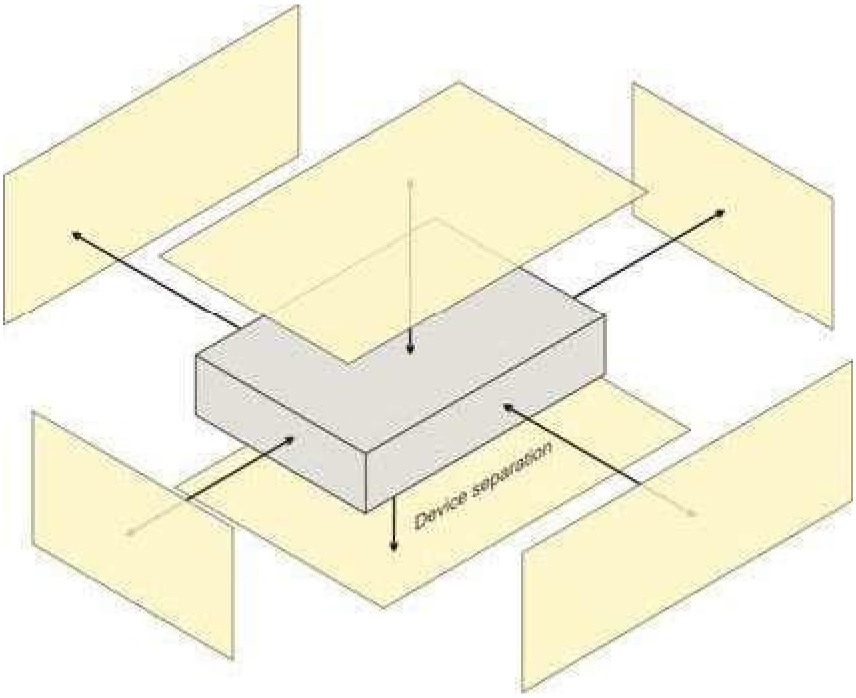
8. Position of the wireless device in relation to the phantom

8.1. Generic device

For a device that can not be categorized as any of the other specific device types, it shall be considered to be a generic device;

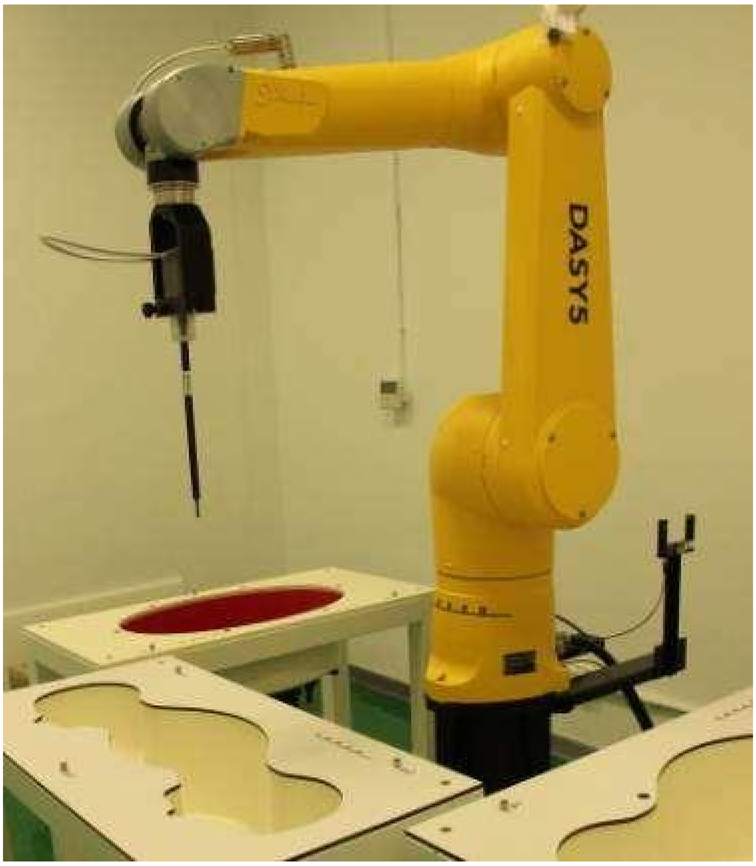
The SAR evaluation shall be performed for all surfaces of the DUT that are accessible during intended use, as indicated in Picture 8-1. The separation distance in testing shall correspond to the intended use distance as specified in the user instructions provided by the manufacturer. If the intended use is not specified, all surfaces of the DUT shall be tested directly against the flat phantom.

The surface of the generic device (or the surface of the carry accessory holding the DUT) pointing towards the flat phantom shall be parallel to the surface of the phantom.



Picture 8.1-1 Test positions for Generic device

8.2. DUT Setup Photo



Picture 8.2-1: Specific Absorption Rate Test Layout

9. Tissue Simulating Liquids

9.1. Equivalent Tissues

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 9.1-1 and 9.1-2 shows the detail solution. The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Table 9.1-1 Composition of the Head Tissue Equivalent Matter

Frequency (MHz)	835	1750	1900	2450
Ingredients (% by weight)				
water	41.45	55.24	54.89	58.79
sugar	56.00	/	/	/
salt	1.45	0.306	0.18	0.06
preventol	0.1	/	/	/
cellulose	1.0	/	/	/
ClycolMonobutyl	/	44.45	44.93	41.15
Dielectric Parameters Target Value	f=850MHz ε=41.5 σ=0.91	f=1750MHz ε=40.08 σ=1.37	f=1950MHz ε=40.0 σ=1.40	f=2450MHz ε=39.20 σ=1.80

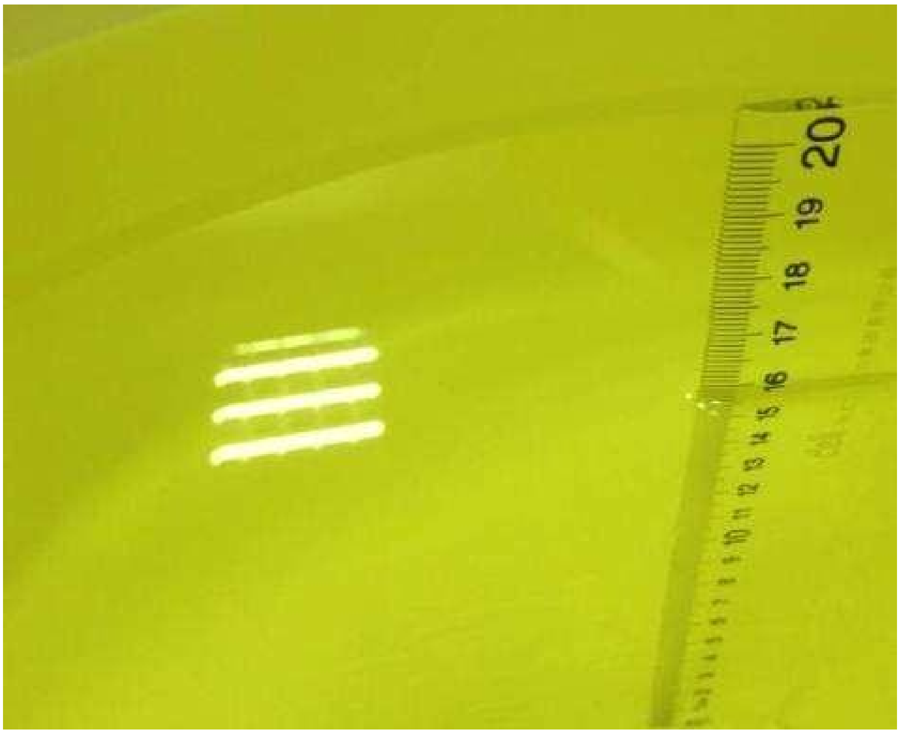
Table 9.1-2 Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Conductivity (σ)	± 5% Range	Permittivity (ε)	± 5% Range
750	Head	0.893	0.849~0.938	41.942	39.840~44.040
835	Head	0.910	0.865~0.956	41.555	39.477~43.632
1750	Head	1.371	1.302~1.440	40.079	38.075~42.083
1900	Head	1.400	1.330~1.470	40.000	38.000~42.000
2450	Head	1.800	1.710~1.890	39.200	37.240~41.160

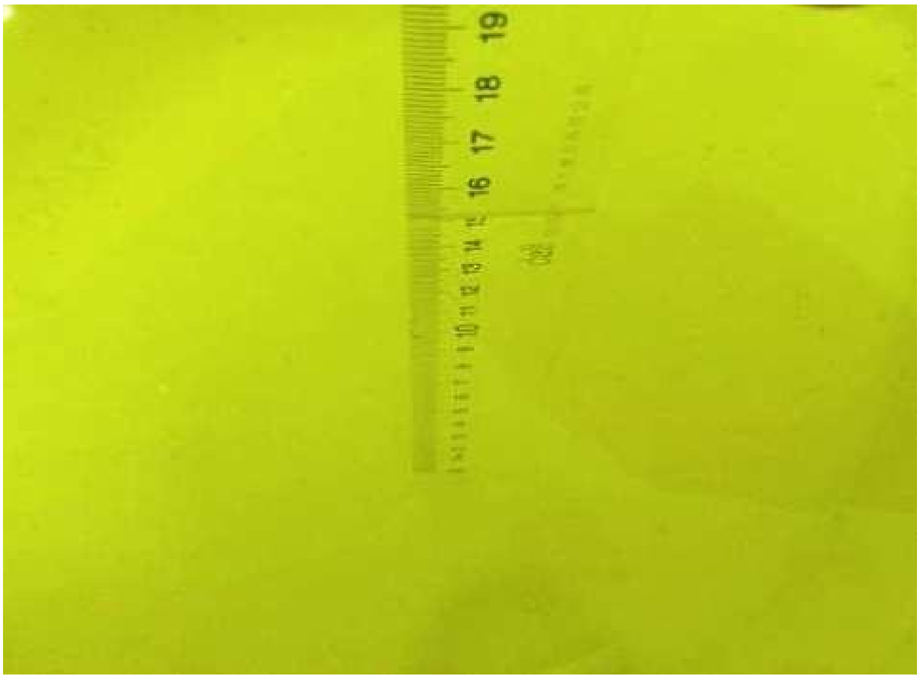
9.2. Dielectric Performance

Table 9.2-1: Dielectric Performance of Head Tissue Simulating Liquid

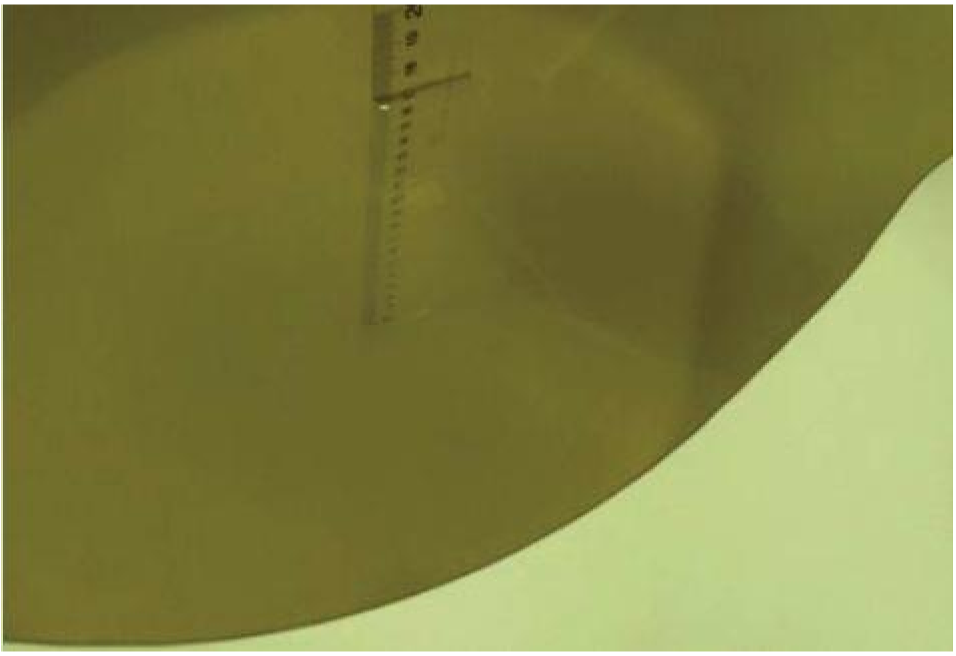
Measurement Value						
Liquid Temperature: 22.5℃						
Type	**Frequency (MHz)**	**Permittivity ε**	**Drift (%)**	**Conductivity σ**	**Drift (%)**	**Test Date**
Head	750	42.101	3.79	0.894	1.12	2022-05-30
Head	835	43.156	3.85	0.915	0.55	2022-05-31
Head	835	40.993	-1.35	0.902	-0.88	2022-06-01
Head	1750	41.103	2.56	1.361	-0.73	2022-05-25
Head	1750	41.103	2.56	1.361	-0.73	2022-05-26
Head	1900	39.218	-1.96	1.426	1.86	2022-05-23
Head	1900	39.218	-1.96	1.426	1.86	2022-05-24
Head	2450	38.897	-0.77	1.86	3.33	2022-06-02



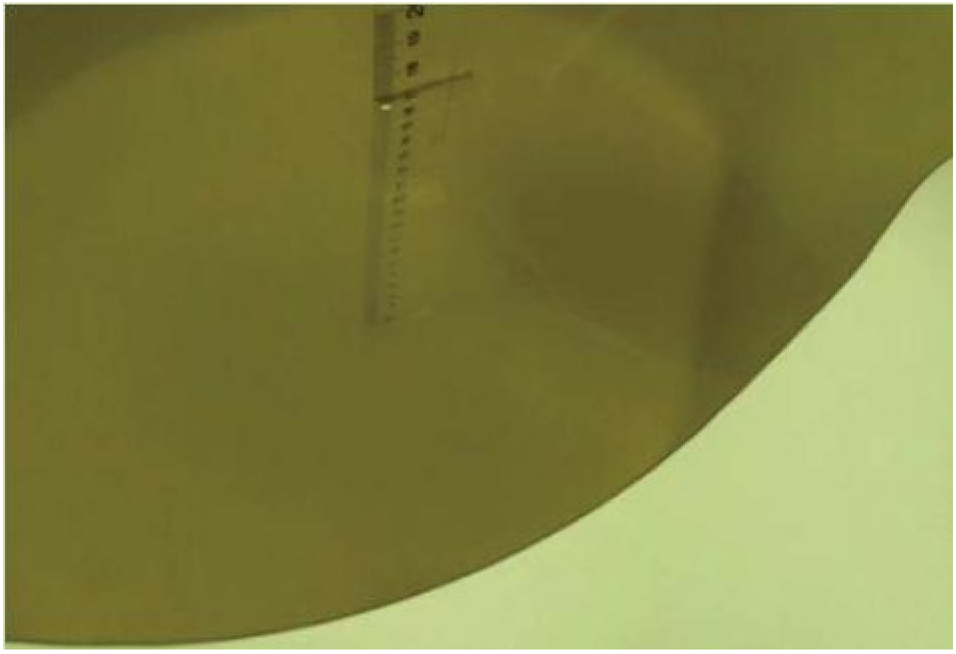
Picture9.2-1:Liquid depth in the Flat Phantom (750 MHz Head)



Picture 9.2-2: Liquid depth in the Flat Phantom (835 MHz Head)



Picture 9.2-3: Liquid depth in the Flat Phantom (1750&1900 MHz Head)



Picture 9.2-4: Liquid depth in the Flat Phantom (2450&2600MHz Head)

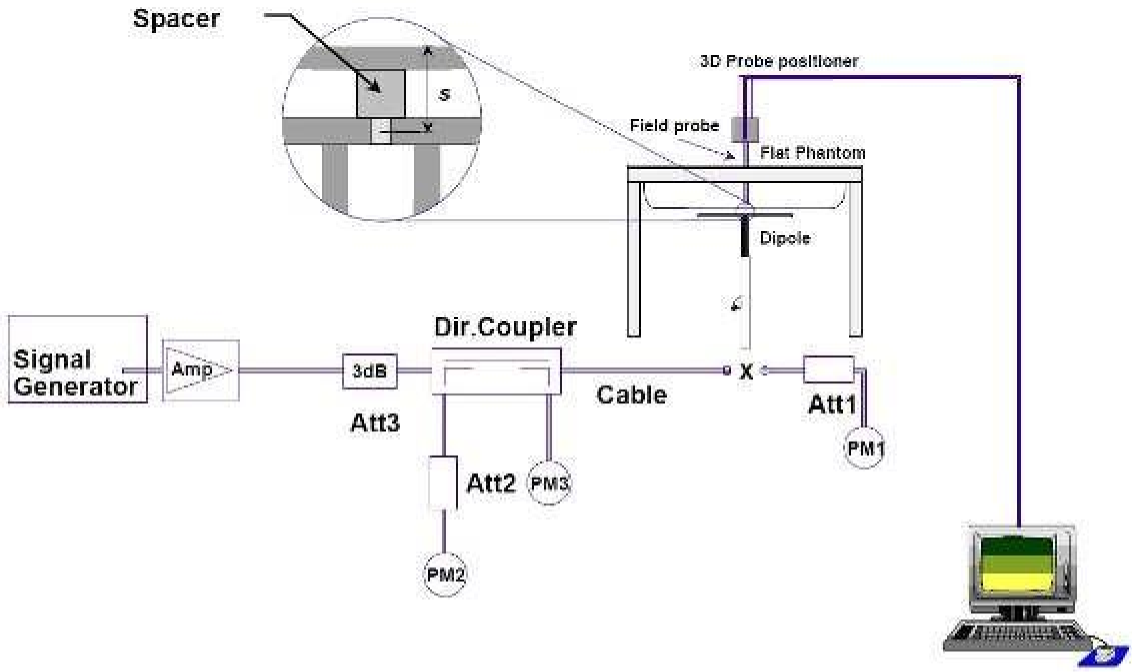
10. System Validation

10.1. System Validation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performace check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

10.2. System Setup

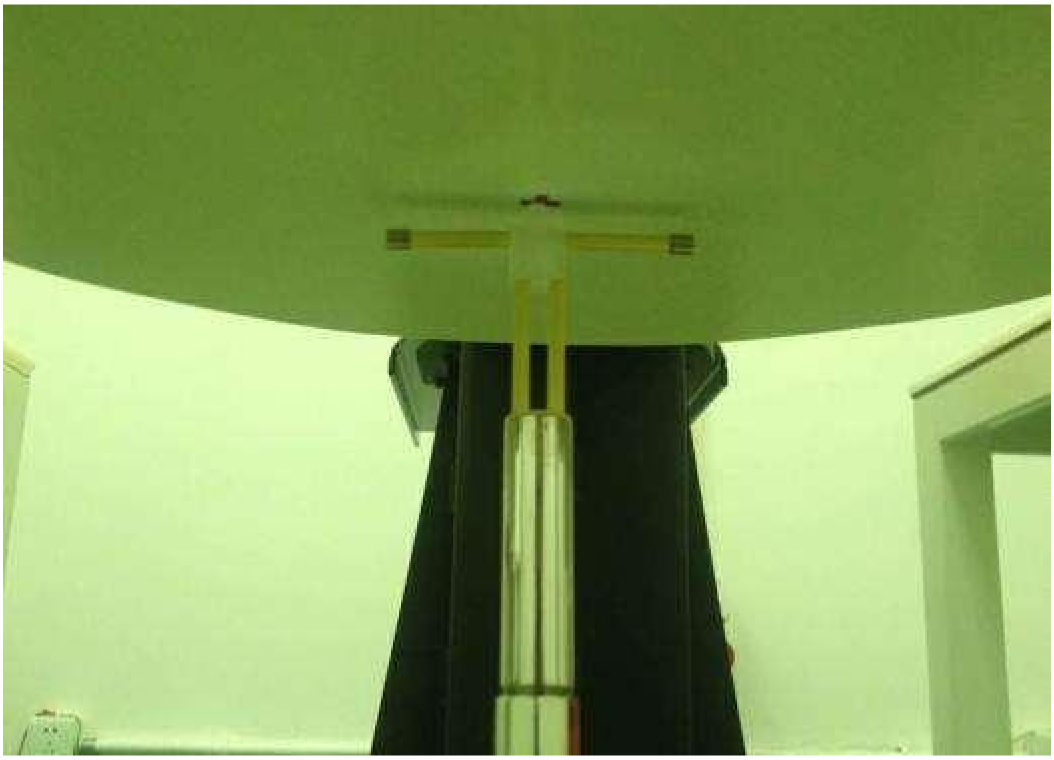
In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



Picture 10-1 System Setup for System Evaluation

The output power on dipole port must be calibrated to 24 dBm (250mW) before dipole is connected.

The results are normalized to 1 W input power.



Picture 10.2-1: Photo of Dipole Setup

Table 10.2-1: System Validation of Head

Verification Results							
Input power level: 1W							
Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation		Test date
	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	
750MHz	2.07	1.37	1.92	1.29	-7.24%	-5.84%	2022-05-30
835MHz	2.40	1.60	2.32	1.52	-3.33%	-5.00%	2022-05-31
835MHz	2.40	1.60	2.39	1.55	-0.42%	-3.13%	2022-06-01
1750MHz	8.96	4.73	8.63	4.73	-3.68%	0.00%	2022-05-25
1750MHz	8.96	4.73	9.13	4.96	1.90%	4.86%	2022-05-26
1900 MHz	9.78	5.04	9.31	4.94	-4.81%	-1.98%	2022-05-23
1900 MHz	9.78	5.04	9.57	5.02	2.15%	0.40%	2022-05-24
2450 MHz	13.50	6.18	13.6	6.17	0.74%	-0.16%	2022-06-02

11. Measurement Procedures

11.1. Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in Picture 19

Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in Chapter 8),

b) all configurations for each device position in a), e.g., antenna extended and retracted, and

c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 11.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.

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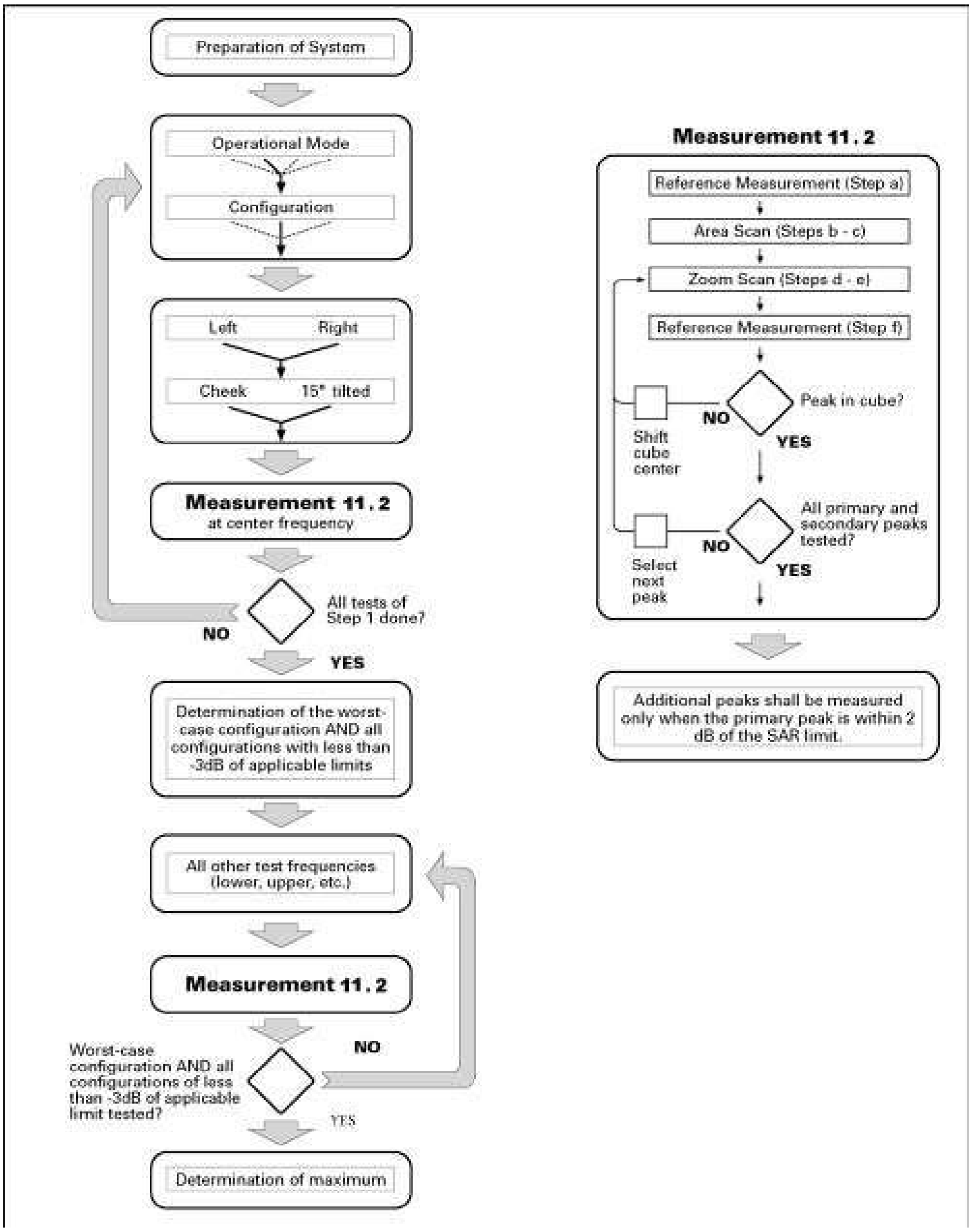

Picture 11.1-1: Block diagram of the tests to be performed

11.2. Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 19) described in 11.1:

a) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, whereδis the plane wave skin depth and In(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional uncertainty evaluation is needed.

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;

d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step c). The horizontal grid step shall be (24 / f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and In(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5°. If this cannot be achieved an additional uncertainty evaluation is needed.

e) Use post processing(e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

11.3. WCDMA Measurement Procedures for SAR

The following procedures are applicable to WCDMA handsets operating under 3GPP Release99, Release 5 and Release 6. The default test configuration is to measure SAR with an established radio link between the DUT and a communication test set using a 12.2kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations (DPCCH & DPDCHn), HSDPA and HSPA (HSUPA/HSDPA) modes according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. SAR for Release 5 HSDPA and Release 6 HSPA are measured using the applicable FRC (fixed reference channel) and E-DCH reference channel configurations. Maximum output power is verified according to applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. When Maximum Power Reduction (MPR) is not implemented according to Cubic Metric (CM) requirements for Release 6 HSPA, the following procedures do not apply.

For Release 5 HSDPA Data Devices:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}	CM/dB
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

For Release 6 HSPA Data Devices:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1039/225	4	1	1.5	1.5	20	75
2	6/15	15/15	64	6/15	12/15	12/15	12/15	4	1	1.5	1.5	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	1.5	1.5	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	1.5	1.5	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	1.5	1.5	21	81

Rel.8 DC-HSDPA (Cat 24)
SAR test exclusion for Rel.8 DC-HSDPA must satisfy the SAR test exclusion requirements of Rel.5 HSDPA. SAR test exclusion for DC-HSDPA devices is determined by power measurements according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to qualify for SAR test exclusion.

11.4. SAR Measurement for LTE

SAR tests for LTE are performed with a base station simulator, Rohde & Rchwarz CMW500. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.
All powers were measured with the CMW 500.
It is performed for conducted power and SAR based on the KDB941225 D05.
SAR is evaluated separately according to the following procedures for the different test positions in each exposure condition – head, body, body-worn accessories and other use conditions. The procedures in the following subsections are applied separately to test each LTE frequency band.

1) QPSK with 1 RB allocation

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

2) QPSK with 50% RB allocation

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

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

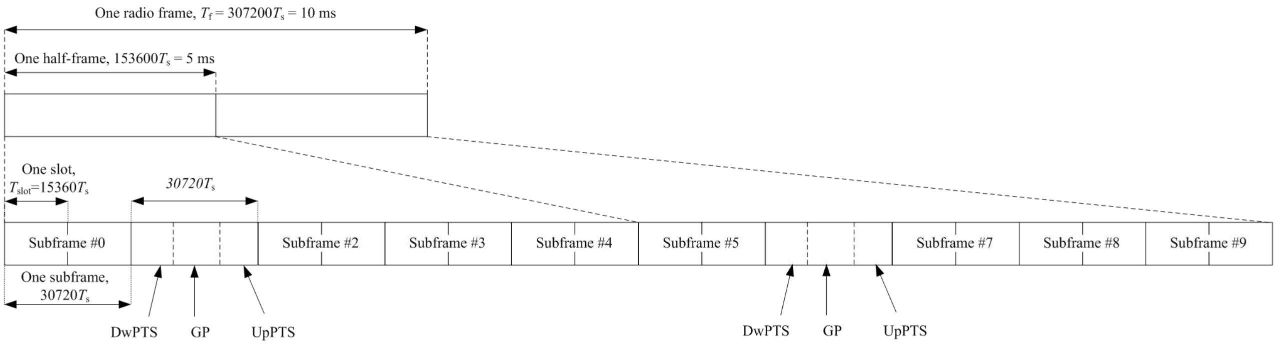

Figure 11.4-1: Frame structure type 2 (for 5 ms switch-point periodicity)

Table 11.4-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 11.4-2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Duty factor is calculated by:
Duty factor = uplink frame*6+UpPTS*2/one frame length
= (30720.Ts * 6+5120. Ts*2)/307200.Ts
= 0.633

11.5 Bluetooth & Wi-Fi Measurement Procedures For SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

11.6 Power Drift

To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Section 15 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

12 Area Scan Based 1-g SAR

12.1 Requirement of KDB

According to the KDB447498D01v05,when the implementation is based the specific polynomial it algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007)and the estimated 1-g SARis≤1.2W/kg, a zoom scan measurement is not required provided it is also not needed For any other purpose ;for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between is tinctive peak sand scattered noisy SAR distributions from area scans.

There must not be any warning or alert messages due to various measurement concerns identified by the SAR system; for example, noise in measurements ,peaks too close to scan boundary, peaks are too sharp, spatial resolution and uncertainty issues etc. The SAR system verification must also demonstrate that the area scan estimated 1-gSAR is within 3%of the zoom scan 1-g SAR (See Annex A).When all the SAR results for each exposure condition in a frequency band and wireless mode are based on estimated 1-g SAR, the 1-g SAR for the highest SAR configuration must be determined by a zoom scan.

12.2 Fast SAR Algorithms

The approach is based on the area scan measurement applying a frequency dependent attenuation parameter. This attenuation parameter was empiri call determined by analyzing a large number of phones. The MOTOROLAFASTSAR was developed and validated by the MOTOROLA Research Group in Ft .Lauderdale.

In the initial study, an approximation algorithm based on Linearf it was developed. The accuracy of the algorithm has been demonstrated across abroad frequency range(136-2450 MHz)andforboth1-gand 10-g averaged SAR using a sample of 264SARmeasurementsfrom55 wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithmare1.2%and 5.8%for1-g and 10-g averaged SAR, respectively. The paper describing the algorith min detail is expected to be published inAugust2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomia lf it where by the frequency validity was extended to cover the range 30-6000MHz.Detailsof this study can be found in the BEMS2007 Proceedings.

Both algorithms are implemented in DASY software.

13 Conducted Output Power

13.1 Manufacturing Tolerance

Table13.1-1: Summary of Receiver detection mechanism

Antenna	Receiver on (head scenario)	Receiver off + Hotspot off (Body scenario)	Receiver off + Hotspot on (Hotspot scenario)
Main Antenna	Power Level A1	Power Level B1	Power Level C1

13.2 GSM Measurement Result

Table 13.2-1: The conducted power measurement results-GSM850 Power Level A1/B1/C1

GSM 850 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	33.05	**33.14**	33.1	33.3	/	/	/	/
GSM 850 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	128	190	251			128	190	251
1 Txslot	33.11	33.15	33.04	33.3	-9.03	24.08	24.12	24.01
2 Txslots	29.82	29.86	29.75	30.5	-6.02	23.8	23.84	23.73
3 Txslots	28.92	28.95	28.85	29.5	-4.26	24.66	24.69	24.59
4 Txslots	27.84	27.9	27.82	28.0	-3.01	24.83	**24.89**	24.81
GSM 850 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	128	190	251			128	190	251
1 Txslot	33.09	33.12	33.03	33.3	-9.03	24.06	24.09	24
2 Txslots	29.8	29.84	29.75	30.5	-6.02	23.78	23.82	23.73
3 Txslots	28.89	28.93	28.83	29.5	-4.26	24.63	24.67	24.57
4 Txslots	27.84	27.89	27.81	28.0	-3.01	24.83	**24.88**	24.8
GSM 850 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	128	190	251			251	190	128
1 Txslot	27.93	27.74	27.9	28.0	-9.03	18.9	18.71	18.87
2 Txslots	24	23.85	24.04	24.5	-6.02	17.98	17.83	18.02
3Txslots	22.93	22.86	22.91	23.5	-4.26	18.67	18.6	18.65
4 Txslots	21.81	21.76	21.84	22.5	-3.01	18.8	18.75	18.83

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the body measurements are performed with 4TX slots for GSM850.

Table 13.2-2: The conducted power measurement results-GSM1900 Power Level B1/C1

PCS1900 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	27.27	**27.35**	27.54	28.5	/	/	/	/
PCS1900 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	27.19	27.34	27.51	28.5	-9.03	18.16	18.31	18.48
2 Txslots	25.21	25.37	25.56	26	-6.02	19.19	19.35	19.54
3 Txslots	24.1	24.28	24.46	25	-4.26	19.84	20.02	20.2
4 Txslots	23.16	23.31	23.51	24	-3.01	20.15	**20.3**	20.5
PCS1900 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	27.21	27.34	27.5	28.5	-9.03	18.18	18.31	18.47
2 Txslots	25.22	25.37	25.56	26	-6.02	19.2	19.35	19.54
3Txslots	24.11	24.27	24.45	25	-4.26	19.85	20.01	20.19
4 Txslots	23.16	23.29	23.49	24	-3.01	20.15	20.28	20.48
PCS1900 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	23.42	23.24	23.22	24	-9.03	14.39	14.21	14.19
2 Txslots	21.42	21.08	21.22	21.5	-6.02	15.4	15.06	15.2
3Txslots	20.36	20.13	20.23	20.5	-4.26	16.1	15.87	15.97
4 Txslots	19.23	19.09	19.17	19.5	-3.01	16.22	16.08	16.16

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01Db

According to the conducted power as above, the body measurements are performed with 4TX slots for GSM1900.

Table 13.2-3: The conducted power measurement results-GSM1900 Power Level A1

PCS1900 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	29.86	29.94	30.03	31	/	/	/	/
PCS1900 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	29.9	29.95	30.07	31	-9.03	20.87	20.92	21.04
2 Txslots	27.05	27.14	27.35	28	-6.02	21.03	21.12	21.33
3 Txslots	26.04	26.13	26.34	27	-4.26	21.78	21.87	22.08
4 Txslots	25	25.1	25.33	25.5	-3.01	21.99	22.09	22.32
PCS1900 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	29.9	30.06	30.09	31	-9.03	20.87	21.03	21.06
2 Txslots	27.03	27.23	27.35	28	-6.02	21.01	21.21	21.33
3Txslots	26.01	26.21	26.35	27	-4.26	21.75	21.95	22.09
4 Txslots	24.98	25.15	25.33	25.5	-3.01	21.97	22.14	22.32
PCS1900 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	512	661	810			512	661	810
1 Txslot	26.32	26.01	26.13	26.5	-9.03	17.29	16.98	17.1
2 Txslots	23.07	22.86	22.97	23.5	-6.02	17.05	16.84	16.95
3Txslots	21.86	21.72	21.92	22.5	-4.26	17.6	17.46	17.66
4 Txslots	20.79	20.55	20.91	21.5	-3.01	17.78	17.54	17.9

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the body measurements are performed with 4TX slots for GSM1900.

13.3 WCDMA Measurement Result

Table 13.3-1: The conducted Power for WCDMA 1900-Power Level A1

WCDMA1900	Sub test	FDDII result (dBm)			Tune up
		9538/9938 (1907.6MHz)	9400/9800 (1880MHz)	9262/9662 (1852.4MHz)	
	/	23.92	**23.85**	23.82	25.0
HSUPA	1	21.15	21.43	21.75	22.5
	2	21.17	21.10	21.76	22.5
	3	20.15	20.12	21.81	22.0
	4	21.37	21.45	21.86	22.5
	5	21.62	21.13	21.77	22.5
HSPA+		21.21	21.08	21.26	22.5
DC-HSDPA	1	21.44	21.15	21.26	23.0
	2	20.75	20.85	20.87	21.5
	3	20.03	20.13	20.14	20.5
	4	21.20	21.05	21.23	22.5

Table 13.3-2: The conducted Power for WCDMA 1900-Power Level B1

WCDMA1900	Sub test	FDDII result (dBm)			Tune up
		9538/9938 (1907.6MHz)	9400/9800 (1880MHz)	9262/9662 (1852.4MHz)	
	/	21.73	21.61	21.63	23.0
HSUPA	1	19.05	19.10	19.01	19.5
	2	18.92	18.72	18.75	19.5
	3	18.26	19.65	17.96	19.9
	4	19.27	19.42	19.12	19.5
	5	19.06	19.68	18.96	20.5
HSPA+	/	19.13	19.05	19.33	20.5
DC-HSDPA	1	19.22	19.06	19.08	20.0
	2	18.38	19.28	18.46	20.0
	3	18.26	18.05	18.22	19.0
	4	19.14	18.98	19.22	20.0

Table 13.3-3: The conducted Power for WCDMA 1900-Power Level C1

WCDMA1900	Sub test	FDDII result (dBm)			Tune up
		9538/9938 (1907.6MHz)	9400/9800 (1880MHz)	9262/9662 (1852.4MHz)	
	/	20.72	20.62	20.65	22.0
HSUPA	1	18.11	17.90	18.05	18.5
	2	17.79	17.71	17.74	18.5
	3	17.02	17.11	17.05	18
	4	18.12	18.13	18.15	18.5
	5	17.92	17.91	18.01	18.5
HSPA+	/	18.21	18.06	18.15	19.5
DC-HSDPA	1	18.22	18.16	18.01	20.0
	2	17.68	17.59	17.65	19.0
	3	16.96	16.94	16.76	18.0
	4	18.23	17.96	18.01	19.5

Table 13.3-4: The conducted Power for WCDMA 1700-Power Level A1

WCDMA1700	Sub test	FDDII result (dBm)			Tune up
		1513/1738 (1752.6MHz)	1412/1637 (1732.4MHz)	1312/1537 (1712.4MHz)	
	/	23.89	23.86	23.85	25.0
HSUPA	1	21.22	21.33	21.25	22.5
	2	20.89	20.56	20.79	21.5
	3	20.35	20.23	20.13	21.5
	4	21.32	21.28	21.27	22.0
	5	21.29	21.31	21.42	22.0
HSPA+	/	21.21	21.37	21.38	22.5
DC-HSDPA	1	21.20	21.15	21.23	21.5
	2	20.65	21.15	20.45	21.5
	3	20.24	20.15	20.25	21.5
	4	21.23	21.32	21.33	22.0

Table 13.3-5: The conducted Power for WCDMA1700-Power Level B1

WCDMA1700	Sub test	FDDIV result (dBm)			Tune up
		1513/1738 (1752.6MHz)	1412/1637 (1732.4MHz)	1312/1537 (1712.4MHz)	
	/	22.41	22.43	22.48	22.0
HSUPA	1	19.25	19.01	19.17	19.5
	2	18.85	18.97	19.02	19.5
	3	18.04	18.13	18.24	19.5
	4	19.11	19.12	19.37	19.5
	5	18.91	19.02	19.12	19.5
HSPA+	/	19.18	19.22	19.41	20.5
DC-HSDPA	1	19.15	19.22	19.24	20.0
	2	18.16	18.70	18.45	20.0
	3	17.89	17.91	17.98	18.0
	4	19.15	19.18	19.36	20.5

Table 13.3-6: The conducted Power for WCDMA 1700-Power Level C1

WCDMA1700	Sub test	FDDIV result (dBm)			Tune up
		1513/1738 (1752.6MHz)	1412/1637 (1732.4MHz)	1312/1537 (1712.4MHz)	
	/	20.75	20.74	20.86	22.0
HSUPA	1	17.93	18.14	18.10	18.5
	2	17.87	17.80	18.13	18.5
	3	17.09	17.19	17.15	18.5
	4	18.01	18.13	18.30	18.5
	5	17.90	18.13	18.04	18.5
HSPA+		18.15	18.11	18.31	19.5
DC-HSDPA	1	18.22	18.14	18.24	19.0
	2	18.21	17.27	17.67	19.0
	3	16.96	17.05	17.24	18.0
	4	18.11	18.07	18.19	19.0

Table 13.3-7: The conducted Power for WCDMA850-Power Level B1/C1

WCDMA850	Sub test	FDDV result (dBm)			Tune up
		4233/4458 (846.6MHz)	4183/4408 (836.6MHz)	4132/4357 (826.4MHz)	
	/	24.72	24.67	24.66	25.0
HSUPA	1	22.40	22.03	22.88	23.5
	2	21.67	21.79	21.79	22.5
	3	21.02	20.97	21.10	22.0
	4	22.05	22.23	22.35	22.5
	5	22.15	22.11	22.08	22.5
HSPA+		21.54	21.80	22.15	23.0
DC-HSDPA	1	21.79	22.09	22.23	23.5
	2	21.52	21.55	21.51	22.5
	3	21.03	21.05	20.89	22.0
	4	21.53	21.79	22.10	22.5

Table 13.3-8: The conducted Power for WCDMA850-Power Level A1

WCDMA850	Sub test	FDDV result (dBm)			Tune up
		4233/4458 (846.6MHz)	4183/4408 (836.6MHz)	4132/4357 (826.4MHz)	
	/	22.64	22.61	22.65	23.0
HSUPA	1	20.03	20.10	19.78	21.0
	2	19.81	19.82	19.95	20.5
	3	18.91	18.86	18.94	19.5
	4	20.10	20.07	20.11	21.0
	5	19.78	19.82	20.19	21.0
HSPA+	/	20.02	20.06	20.04	21.0
DC-HSDPA	1	19.91	20.01	20.03	21.0
	2	20.05	19.72	19.37	21.0
	3	18.93	18.81	18.92	20.0
	4	19.96	20.02	20..00	21.0

13.4 LTE Measurement Result

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

Band	Tune up (dBm)		
	Receiver on (head scenario)	**Receiver off + Hotspot off (Body scenario)**	**Receiver off + Hotspot on (Hotspot scenario)**
	Level A1	Level B1	Level C1
Band 2	25	24	23
Band 5	23	25	25
Band 12	23	25	25
Band 66	25	23	22

LTE band2 power level A1					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	1909.3 (19193)	24.15	23.20	21.88
		1880 (18900)	23.99	22.73	22.12
		1850.7 (18607)	23.88	22.60	21.74
	1RB-Middle (3)	1909.3 (19193)	24.50	23.60	22.43
		1880 (18900)	24.35	23.00	22.60
		1850.7 (18607)	24.35	23.10	22.10
	1RB-Low (0)	1909.3 (19193)	24.10	23.50	22.19
		1880 (18900)	24.05	22.85	22.39
		1850.7 (18607)	24.11	22.87	21.94
	3RB-High (3)	1909.3 (19193)	24.20	23.24	21.92
		1880 (18900)	24.19	23.22	21.98
		1850.7 (18607)	24.04	23.22	21.82
	3RB-Middle (1)	1909.3 (19193)	24.30	23.50	21.83
		1880 (18900)	24.23	23.31	21.99
		1850.7 (18607)	24.20	23.39	21.90
	3RB-Low (0)	1909.3 (19193)	24.30	23.50	21.79
		1880 (18900)	24.14	23.22	21.93
		1850.7 (18607)	24.13	23.32	21.83
	6RB (0)	1909.3 (19193)	23.28	22.13	21.23
		1880 (18900)	23.17	22.30	20.97
		1850.7 (18607)	23.16	22.34	20.93
3MHz	1RB-High (14)	1908.5 (19185)	24.05	22.84	22.35
		1880 (18900)	23.96	23.31	21.81
		1851.5 (18615)	24.06	22.78	21.61
	1RB-Middle (7)	1908.5 (19185)	24.40	23.27	22.76
		1880 (18900)	24.35	23.71	22.26
		1851.5 (18615)	24.37	23.17	22.08
	1RB-Low (0)	1908.5 (19185)	24.22	23.12	22.51
		1880 (18900)	24.15	23.48	21.98
		1851.5 (18615)	24.22	23.00	21.80

	8RB-High (7)	1908.5 (19185)	23.28	22.25	21.06
		1880 (18900)	23.15	22.27	20.91
		1851.5 (18615)	23.22	22.17	20.93
	8RB-Middle (4)	1908.5 (19185)	23.36	22.37	21.13
		1880 (18900)	23.25	22.35	21.02
		1851.5 (18615)	23.28	22.25	21.04
	8RB-Low (0)	1908.5 (19185)	23.32	22.32	21.11
		1880 (18900)	23.21	22.38	20.96
		1851.5 (18615)	23.24	22.18	20.96
	15RB (0)	1908.5 (19185)	23.28	22.31	20.96
		1880 (18900)	23.16	22.22	20.94
		1851.5 (18615)	23.20	22.22	20.93
5MHz	1RB-High (24)	1907.5 (19175)	23.85	22.80	22.30
		1880 (18900)	23.87	22.88	21.81
		1852.5 (18625)	23.88	23.44	21.88
	1RB-Middle (12)	1907.5 (19175)	24.40	23.28	22.87
		1880 (18900)	24.48	23.42	22.48
		1852.5 (18625)	24.42	24.00	22.54
	1RB-Low (0)	1907.5 (19175)	24.08	23.11	22.42
		1880 (18900)	24.15	23.10	22.07
		1852.5 (18625)	24.07	23.66	22.11
	12RB-High (13)	1907.5 (19175)	23.27	22.33	21.12
		1880 (18900)	23.20	22.22	20.89
		1852.5 (18625)	23.27	22.35	20.94
	12RB-Middle (6)	1907.5 (19175)	23.38	22.43	21.21
		1880 (18900)	23.27	22.28	20.98
		1852.5 (18625)	23.30	22.38	20.96
	12RB-Low (0)	1907.5 (19175)	23.28	22.31	21.14
		1880 (18900)	23.22	22.25	20.95
		1852.5 (18625)	23.25	22.29	20.91
	25RB (0)	1907.5 (19175)	23.26	22.27	21.06
		1880 (18900)	23.22	22.24	20.91
		1852.5 (18625)	23.22	22.32	20.87
10MHz	1RB-High (49)	1905 (19150)	23.88	22.86	21.71
		1880 (18900)	23.85	23.31	22.23
		1855 (18650)	24.00	22.70	21.81
	1RB-Middle (24)	1905 (19150)	24.44	23.24	22.08
		1880 (18900)	24.30	23.70	22.66
		1855 (18650)	24.41	23.05	22.22
	1RB-Low (0)	1905 (19150)	24.20	23.08	21.87
		1880 (18900)	24.11	23.45	22.46
		1855 (18650)	24.14	22.90	21.96
	25RB-High (25)	1905 (19150)	23.32	22.39	21.19
		1880 (18900)	23.24	22.32	20.97
		1855 (18650)	23.31	22.41	21.07
	25RB-Middle (12)	1905 (19150)	23.35	22.41	21.20

		1880 (18900)	23.24	22.31	21.02
		1855 (18650)	23.30	22.40	20.98
	25RB-Low (0)	1905 (19150)	23.37	22.45	21.34
		1880 (18900)	23.29	22.35	21.03
		1855 (18650)	23.20	22.33	20.98
	50RB (0)	1905 (19150)	23.36	22.40	21.13
		1880 (18900)	23.22	22.27	20.98
		1855 (18650)	23.28	22.32	21.03
15MHz	1RB-High (74)	1902.5 (19125)	24.00	22.66	22.20
		1880 (18900)	23.82	22.83	21.54
		1857.5 (18675)	23.88	23.19	21.56
	1RB-Middle (37)	1902.5 (19125)	24.49	23.28	22.77
		1880 (18900)	24.33	23.32	22.15
		1857.5 (18675)	24.38	23.66	22.14
	1RB-Low (0)	1902.5 (19125)	24.19	23.07	22.39
		1880 (18900)	24.04	22.93	21.81
		1857.5 (18675)	24.11	23.48	21.77
	36RB-High (38)	1902.5 (19125)	23.39	22.32	21.15
		1880 (18900)	23.27	22.25	21.01
		1857.5 (18675)	23.37	22.34	21.14
	36RB-Middle (19)	1902.5 (19125)	23.47	22.41	21.21
		1880 (18900)	23.34	22.30	21.03
		1857.5 (18675)	23.36	22.36	21.10
	36RB-Low (0)	1902.5 (19125)	23.43	22.33	21.18
		1880 (18900)	23.33	22.31	21.10
		1857.5 (18675)	23.28	22.27	21.05
	75RB (0)	1902.5 (19125)	23.47	22.35	21.12
		1880 (18900)	23.25	22.26	21.05
		1857.5 (18675)	23.31	22.33	21.11
20MHz	1RB-High (99)	1900 (19100)	23.87	23.50	22.22
		1880 (18900)	23.83	23.06	21.44
		1860 (18700)	23.80	23.02	21.80
	1RB-Middle (50)	1900 (19100)	24.44	23.95	22.65
		1880 (18900)	24.35	23.62	21.91
		1860 (18700)	24.41	23.55	22.39
	1RB-Low (0)	1900 (19100)	24.03	23.62	22.30
		1880 (18900)	24.02	23.25	21.57
		1860 (18700)	24.11	23.30	22.08
	50RB-High (50)	1900 (19100)	23.13	22.22	20.93
		1880 (18900)	23.16	22.15	20.89
		1860 (18700)	23.27	22.28	21.13
	50RB-Middle (25)	1900 (19100)	23.28	22.40	21.04
		1880 (18900)	23.22	22.26	20.95
		1860 (18700)	23.23	22.22	21.06
	50RB-Low (0)	1900 (19100)	23.22	22.30	21.03
		1880 (18900)	23.25	22.33	20.99

		1860 (18700)	23.12	22.12	20.97
	100RB (0)	1900 (19100)	23.28	22.28	21.00
		1880 (18900)	23.21	22.19	20.99
		1860 (18700)	23.22	22.23	21.01

LTE band66 power level A1					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	1779.3(132665)	24.37	23.53	21.56
		1745.0(132322)	24.16	22.80	22.01
		1710.7(131979)	24.14	23.44	22.05
	1RB-Middle (3)	1779.3(132665)	24.40	23.72	22.06
		1745.0(132322)	24.55	23.35	22.31
		1710.7(131979)	24.56	23.85	22.45
	1RB-Low (0)	1779.3(132665)	24.18	23.49	21.75
		1745.0(132322)	24.38	23.09	22.08
		1710.7(131979)	24.35	23.63	22.18
	3RB-High (3)	1779.3(132665)	24.30	23.53	22.11
		1745.0(132322)	24.28	23.40	22.15
		1710.7(131979)	24.44	23.66	22.33
	3RB-Middle (1)	1779.3(132665)	24.42	23.57	22.14
		1745.0(132322)	24.45	23.56	22.16
		1710.7(131979)	24.56	23.72	22.45
	3RB-Low (0)	1779.3(132665)	24.36	23.52	22.09
		1745.0(132322)	24.36	23.47	22.11
		1710.7(131979)	24.50	23.66	22.43
	6RB (0)	1779.3(132665)	23.35	22.25	21.28
		1745.0(132322)	23.43	22.58	21.18
		1710.7(131979)	23.47	22.34	21.15
3MHz	1RB-High (14)	1778.5(132657)	24.00	22.78	21.09
		1745.0(132322)	24.09	23.35	22.10
		1711.5(131987)	24.23	22.92	21.83
	1RB-Middle (7)	1778.5(132657)	24.38	23.27	21.15
		1745.0(132322)	24.50	23.82	22.45
		1711.5(131987)	24.55	23.31	22.10
	1RB-Low (0)	1778.5(132657)	24.17	23.11	21.23
		1745.0(132322)	24.32	23.53	22.25
		1711.5(131987)	24.35	23.08	21.95
	8RB-High (7)	1778.5(132657)	23.27	22.23	21.16
		1745.0(132322)	23.33	22.39	21.12
		1711.5(131987)	23.41	22.36	21.28
	8RB-Middle (4)	1778.5(132657)	23.36	22.35	21.82
		1745.0(132322)	23.42	22.48	21.19
		1711.5(131987)	23.50	22.42	21.22
	8RB-Low (0)	1778.5(132657)	23.30	22.31	21.74
		1745.0(132322)	23.36	22.45	21.12
		1711.5(131987)	23.43	22.35	21.16

	15RB (0)	1778.5(132657)	23.26	22.28	21.91
		1745.0(132322)	23.30	22.31	21.08
		1711.5(131987)	23.38	22.36	21.32
5MHz	1RB-High (24)	1777.5(132647)	23.74	22.73	21.71
		1745.0(132322)	23.97	22.93	22.19
		1712.5(131997)	24.01	23.56	21.95
	1RB-Middle (12)	1777.5(132647)	24.37	23.30	22.42
		1745.0(132322)	24.64	23.56	22.65
		1712.5(131997)	24.60	23.91	22.48
	1RB-Low (0)	1777.5(132647)	24.00	23.02	22.09
		1745.0(132322)	24.25	23.15	22.34
		1712.5(131997)	24.23	23.72	22.11
	12RB-High (13)	1777.5(132647)	23.23	22.28	21.00
		1745.0(132322)	23.35	22.33	21.15
		1712.5(131997)	23.43	22.51	21.20
	12RB-Middle (6)	1777.5(132647)	23.34	22.40	21.11
		1745.0(132322)	23.38	22.41	21.21
		1712.5(131997)	23.49	22.53	21.21
	12RB-Low (0)	1777.5(132647)	23.28	22.34	21.12
		1745.0(132322)	23.32	22.33	21.13
		1712.5(131997)	23.36	22.47	21.15
	25RB (0)	1777.5(132647)	23.24	22.25	21.08
		1745.0(132322)	23.31	22.29	21.15
		1712.5(131997)	23.36	22.46	21.11
10MHz	1RB-High (49)	1775.0(132622)	23.85	22.65	21.77
		1745.0(132322)	24.06	22.83	22.05
		1715.0(132022)	24.02	23.42	22.13
	1RB-Middle (24)	1775.0(132622)	24.33	23.06	22.25
		1745.0(132322)	24.45	23.33	22.42
		1715.0(132022)	24.50	23.85	22.56
	1RB-Low (0)	1775.0(132622)	24.16	22.87	22.04
		1745.0(132322)	24.24	23.15	22.18
		1715.0(132022)	24.31	23.54	22.18
	25RB-High (25)	1775.0(132622)	23.23	22.34	21.12
		1745.0(132322)	23.38	22.46	21.25
		1715.0(132022)	23.42	22.46	21.25
	25RB-Middle (12)	1775.0(132622)	23.33	22.43	21.16
		1745.0(132322)	23.37	22.45	21.23
		1715.0(132022)	23.46	22.54	21.23
	25RB-Low (0)	1775.0(132622)	23.33	22.43	21.23
		1745.0(132322)	23.32	22.43	21.11
		1715.0(132022)	23.41	22.46	21.25
	50RB (0)	1775.0(132622)	23.33	22.36	21.07
		1745.0(132322)	23.34	22.33	21.18
		1715.0(132022)	23.44	22.44	21.20
15MHz	1RB-High (74)	1772.5(132597)	24.01	22.56	21.49

		1745.0(132322)	23.92	22.84	22.45
		1717.5(132047)	23.99	23.30	22.57
	1RB-Middle (37)	1772.5(132597)	24.44	23.22	22.05
		1745.0(132322)	24.44	23.42	22.87
		1717.5(132047)	24.54	23.85	22.90
	1RB-Low (0)	1772.5(132597)	24.22	23.04	21.78
		1745.0(132322)	24.21	23.10	22.53
		1717.5(132047)	24.29	23.56	21.16
	36RB-High (38)	1772.5(132597)	23.30	22.30	21.15
		1745.0(132322)	23.46	22.41	21.25
		1717.5(132047)	23.48	22.43	21.19
	36RB-Middle (19)	1772.5(132597)	23.35	22.33	21.19
		1745.0(132322)	23.46	22.38	21.14
		1717.5(132047)	23.52	22.50	21.83
	36RB-Low (0)	1772.5(132597)	23.38	22.31	21.16
		1745.0(132322)	23.41	22.38	21.16
		1717.5(132047)	23.45	22.42	21.23
	75RB (0)	1772.5(132597)	23.38	22.37	21.11
		1745.0(132322)	23.41	22.37	21.22
		1717.5(132047)	23.49	22.45	21.34
20MHz	1RB-High (99)	1770.0(133572)	23.69	22.94	22.24
		1745.0(132322)	23.85	23.42	21.75
		1720.0(132072)	24.00	23.25	21.83
	1RB-Middle (50)	1770.0(133572)	24.52	23.45	22.83
		1745.0(132322)	24.55	23.95	22.39
		1720.0(132072)	24.60	23.81	22.52
	1RB-Low (0)	1770.0(133572)	24.19	23.23	22.41
		1745.0(132322)	24.18	23.72	22.12
		1720.0(132072)	24.18	23.40	22.11
	50RB-High (50)	1770.0(133572)	23.17	22.15	21.12
		1745.0(132322)	23.32	22.40	21.17
		1720.0(132072)	23.36	22.38	21.19
	50RB-Middle (25)	1770.0(133572)	23.23	22.27	21.05
		1745.0(132322)	23.32	22.34	21.16
		1720.0(132072)	23.40	22.42	21.26
	50RB-Low (0)	1770.0(133572)	23.31	22.25	21.11
		1745.0(132322)	23.24	22.28	21.12
		1720.0(132072)	23.41	22.46	21.25
	100RB (0)	1770.0(133572)	23.25	22.25	21.03
		1745.0(132322)	23.27	22.28	21.13
		1720.0(132072)	23.37	22.37	21.18

LTE band2 power level B1					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1909.3 (19193)	22.80	23.05	22.18
		1880 (18900)	22.81	22.55	22.04
		1850.7 (18607)	22.68	22.34	22.01
	1RB-Middle (3)	1909.3 (19193)	23.22	23.52	22.52
		1880 (18900)	23.12	22.84	22.05
		1850.7 (18607)	23.14	22.95	22.33
	1RB-Low (0)	1909.3 (19193)	22.98	23.32	22.18
		1880 (18900)	22.85	22.61	22.00
		1850.7 (18607)	22.91	22.72	22.05
	3RB-High (3)	1909.3 (19193)	23.11	22.99	21.98
		1880 (18900)	23.03	22.71	22.00
		1850.7 (18607)	22.86	22.74	21.97
	3RB-Middle (1)	1909.3 (19193)	23.21	22.98	21.99
		1880 (18900)	23.08	22.86	21.98
		1850.7 (18607)	23.05	22.90	21.99
	3RB-Low (0)	1909.3 (19193)	23.12	22.99	21.94
		1880 (18900)	22.98	22.89	21.88
		1850.7 (18607)	23.02	22.97	21.88
	6RB (0)	1909.3 (19193)	23.12	22.05	21.15
		1880 (18900)	22.98	22.12	21.29
		1850.7 (18607)	23.01	22.19	21.13
3MHz	1RB-High (14)	1908.5 (19185)	22.86	22.65	22.15
		1880 (18900)	22.71	23.11	22.01
		1851.5 (18615)	22.80	22.53	22.30
	1RB-Middle (7)	1908.5 (19185)	23.22	23.13	22.49
		1880 (18900)	23.10	23.48	22.04
		1851.5 (18615)	23.16	22.98	22.28
	1RB-Low (0)	1908.5 (19185)	22.96	22.93	22.25
		1880 (18900)	22.93	23.28	22.00
		1851.5 (18615)	22.98	22.75	22.12
	8RB-High (7)	1908.5 (19185)	23.07	22.09	21.11
		1880 (18900)	22.96	22.05	21.07
		1851.5 (18615)	23.00	22.03	21.06
	8RB-Middle (4)	1908.5 (19185)	23.18	22.21	21.26
		1880 (18900)	23.04	22.14	21.14
		1851.5 (18615)	23.11	22.04	21.04
	8RB-Low (0)	1908.5 (19185)	23.12	22.16	21.16
		1880 (18900)	23.01	22.10	21.07
		1851.5 (18615)	23.06	22.01	21.06
	15RB (0)	1908.5 (19185)	23.10	22.12	21.12
		1880 (18900)	22.97	22.08	21.06
		1851.5 (18615)	23.00	22.01	21.03
5MHz	1RB-High (24)	1907.5 (19175)	22.84	22.78	22.06
		1880 (18900)	22.68	23.11	22.18

		1852.5 (18625)	22.52	22.60	22.01
	1RB-Middle (12)	1907.5 (19175)	23.43	23.31	22.50
		1880 (18900)	23.22	23.71	22.61
		1852.5 (18625)	23.19	23.20	22.31
	1RB-Low (0)	1907.5 (19175)	23.05	22.97	22.16
		1880 (18900)	22.85	23.31	22.26
		1852.5 (18625)	22.84	22.90	22.06
	12RB-High (13)	1907.5 (19175)	23.10	22.12	21.11
		1880 (18900)	22.98	22.06	21.06
		1852.5 (18625)	23.10	22.13	21.05
	12RB-Middle (6)	1907.5 (19175)	23.22	22.25	21.23
		1880 (18900)	23.07	22.14	21.16
		1852.5 (18625)	23.12	22.17	21.10
	12RB-Low (0)	1907.5 (19175)	23.11	22.18	21.12
		1880 (18900)	23.01	22.07	21.08
		1852.5 (18625)	23.03	22.11	21.03
	25RB (0)	1907.5 (19175)	23.13	22.11	21.18
		1880 (18900)	23.02	22.10	21.06
		1852.5 (18625)	23.03	22.04	21.02
10MHz	1RB-High (49)	1905 (19150)	22.89	22.68	22.02
		1880 (18900)	22.63	23.10	22.03
		1855 (18650)	22.84	22.51	22.06
	1RB-Middle (24)	1905 (19150)	23.24	23.11	22.15
		1880 (18900)	23.11	23.47	22.25
		1855 (18650)	23.15	22.89	22.36
	1RB-Low (0)	1905 (19150)	22.97	22.88	22.04
		1880 (18900)	22.89	23.19	22.01
		1855 (18650)	22.91	22.70	22.16
	25RB-High (25)	1905 (19150)	23.15	22.24	21.20
		1880 (18900)	23.04	22.11	21.13
		1855 (18650)	23.16	22.24	21.16
	25RB-Middle (12)	1905 (19150)	23.20	22.27	21.28
		1880 (18900)	23.07	22.13	21.16
		1855 (18650)	23.11	22.22	21.13
	25RB-Low (0)	1905 (19150)	23.21	22.29	21.26
		1880 (18900)	23.09	22.13	21.18
		1855 (18650)	23.01	22.16	21.07
	50RB (0)	1905 (19150)	23.14	22.16	21.18
		1880 (18900)	23.06	22.09	21.08
		1855 (18650)	23.12	22.15	21.11
15MHz	1RB-High (74)	1902.5 (19125)	22.79	22.72	22.01
		1880 (18900)	22.61	22.96	22.38
		1857.5 (18675)	22.69	22.42	22.04
	1RB-Middle (37)	1902.5 (19125)	23.24	23.13	22.09
		1880 (18900)	23.16	23.50	22.77
		1857.5 (18675)	23.20	23.22	22.42

	1RB-Low (0)	1902.5 (19125)	22.91	22.85	22.02
		1880 (18900)	22.83	23.19	22.41
		1857.5 (18675)	22.91	22.94	22.02
	36RB-High (38)	1902.5 (19125)	23.27	22.17	21.21
		1880 (18900)	23.10	22.06	21.01
		1857.5 (18675)	23.19	22.11	21.18
	36RB-Middle (19)	1902.5 (19125)	23.31	22.22	21.23
		1880 (18900)	23.12	22.06	21.08
		1857.5 (18675)	23.12	22.06	21.13
	36RB-Low (0)	1902.5 (19125)	23.27	22.19	21.21
		1880 (18900)	23.13	22.10	21.06
		1857.5 (18675)	23.15	22.02	21.06
	75RB (0)	1902.5 (19125)	23.27	22.24	21.19
		1880 (18900)	23.12	22.11	21.11
		1857.5 (18675)	23.12	22.06	21.06
20MHz	1RB-High (99)	1900 (19100)	22.80	23.19	22.40
		1880 (18900)	22.66	22.87	22.00
		1860 (18700)	22.60	22.84	22.01
	1RB-Middle (50)	1900 (19100)	23.32	23.67	22.93
		1880 (18900)	23.22	23.48	22.40
		1860 (18700)	23.23	23.44	22.30
	1RB-Low (0)	1900 (19100)	22.89	23.27	22.45
		1880 (18900)	22.84	23.09	22.06
		1860 (18700)	22.87	23.14	22.01
	50RB-High (50)	1900 (19100)	23.08	22.09	21.10
		1880 (18900)	22.99	22.01	21.00
		1860 (18700)	23.18	22.12	21.04
	50RB-Middle (25)	1900 (19100)	23.14	22.17	21.10
		1880 (18900)	23.07	22.07	21.07
		1860 (18700)	23.14	22.11	21.06
	50RB-Low (0)	1900 (19100)	23.17	22.18	21.09
		1880 (18900)	23.09	22.09	21.06
		1860 (18700)	22.98	22.05	21.02
	100RB (0)	1900 (19100)	23.16	22.16	21.07
		1880 (18900)	23.08	22.07	21.06
		1860 (18700)	23.12	22.07	21.04

LTE band5 power level B1/C1					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	848.3 (20643)	24.20	23.45	22.60
		836.5 (20525)	24.26	23.02	22.38
		824.7 (20407)	24.19	22.88	22.74
	1RB-Middle (3)	848.3 (20643)	24.55	23.85	22.98
		836.5 (20525)	24.58	23.31	22.63
		824.7 (20407)	24.60	23.40	22.85
	1RB-Low (0)	848.3 (20643)	24.33	23.60	22.80
		836.5 (20525)	24.34	23.06	22.45
		824.7 (20407)	24.38	23.14	22.53
	3RB-High (3)	848.3 (20643)	24.40	23.61	22.60
		836.5 (20525)	24.44	23.45	22.53
		824.7 (20407)	24.33	23.48	22.63
	3RB-Middle (1)	848.3 (20643)	24.52	23.68	22.72
		836.5 (20525)	24.50	23.56	22.60
		824.7 (20407)	24.46	23.60	22.48
	3RB-Low (0)	848.3 (20643)	24.46	23.65	22.71
		836.5 (20525)	24.41	23.47	22.67
		824.7 (20407)	24.39	23.53	22.51
	6RB (0)	848.3 (20643)	23.48	22.32	21.92
		836.5 (20525)	23.45	22.57	21.85
		824.7 (20407)	23.44	22.60	21.89
3MHz	1RB-High (14)	847.5 (20635)	24.25	23.55	22.73
		836.5 (20525)	24.28	22.98	22.67
		825.5 (20415)	24.35	23.11	22.48
	1RB-Middle (7)	847.5 (20635)	24.61	23.90	22.98
		836.5 (20525)	24.66	23.37	22.78
		825.5 (20415)	24.62	23.57	22.73
	1RB-Low (0)	847.5 (20635)	24.44	23.71	22.85
		836.5 (20525)	24.45	23.22	22.55
		825.5 (20415)	24.36	23.32	22.47
	8RB-High (7)	847.5 (20635)	23.48	22.54	21.86
		836.5 (20525)	23.48	22.42	21.85
		825.5 (20415)	23.48	22.48	21.81
	8RB-Middle (4)	847.5 (20635)	23.54	22.62	21.97
		836.5 (20525)	23.55	22.51	21.92
		825.5 (20415)	23.57	22.57	21.91
	8RB-Low (0)	847.5 (20635)	23.51	22.58	21.94
		836.5 (20525)	23.54	22.44	21.90
		825.5 (20415)	23.53	22.53	21.83
	15RB (0)	847.5 (20635)	23.47	22.49	21.83
		836.5 (20525)	23.46	22.42	21.86
		825.5 (20415)	23.51	22.52	21.80
5MHz	1RB-High (24)	846.5 (20625)	24.00	23.01	22.80
		836.5 (20525)	24.15	23.11	22.45

		826.5 (20425)	24.11	23.72	22.50
	1RB-Middle (12)	846.5 (20625)	24.79	23.69	22.90
		836.5 (20525)	24.78	23.66	22.60
		826.5 (20425)	24.67	24.00	22.93
	1RB-Low (0)	846.5 (20625)	24.28	23.31	22.82
		836.5 (20525)	24.46	23.36	22.57
		826.5 (20425)	24.28	23.84	22.58
	12RB-High (13)	846.5 (20625)	23.48	22.54	21.93
		836.5 (20525)	23.46	22.48	21.83
		826.5 (20425)	23.48	22.56	21.85
	12RB-Middle (6)	846.5 (20625)	23.56	22.65	21.95
		836.5 (20525)	23.56	22.56	21.92
		826.5 (20425)	23.57	22.66	21.93
	12RB-Low (0)	846.5 (20625)	23.57	22.62	21.97
		836.5 (20525)	23.47	22.52	21.86
		826.5 (20425)	23.51	22.57	21.84
	25RB (0)	846.5 (20625)	23.54	22.54	21.87
		836.5 (20525)	23.46	22.47	21.95
		826.5 (20425)	23.48	22.60	21.94
10MHz	1RB-High (49)	844 (20600)	24.18	22.92	22.86
		836.5 (20525)	24.28	23.07	22.66
		829 (20450)	24.20	23.60	22.61
	1RB-Middle (24)	844 (20600)	24.84	23.34	22.91
		836.5 (20525)	24.58	23.50	22.89
		829 (20450)	24.61	23.96	22.83
	1RB-Low (0)	844 (20600)	24.39	23.11	22.84
		836.5 (20525)	24.46	23.40	22.78
		829 (20450)	24.38	23.68	22.60
	25RB-High (25)	844 (20600)	23.49	22.61	21.89
		836.5 (20525)	23.55	22.63	21.84
		829 (20450)	23.56	22.62	21.95
	25RB-Middle (12)	844 (20600)	23.54	22.67	21.90
		836.5 (20525)	23.54	22.64	21.85
		829 (20450)	23.57	22.65	21.94
	25RB-Low (0)	844 (20600)	23.58	22.65	21.94
		836.5 (20525)	23.52	22.63	21.89
		829 (20450)	23.59	22.65	21.94
	50RB (0)	844 (20600)	23.51	22.59	21.85
		836.5 (20525)	23.43	22.54	21.88
		829 (20450)	23.58	22.60	21.80

LTE band12 power level B1/C1					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	715.3	24.27	23.37	22.47
		707.5	24.32	23.03	22.23
		699.7	24.27	22.91	22.31
	1RB-Middle (3)	715.3	24.69	23.81	22.89
		707.5	24.61	23.35	22.53
		699.7	24.60	23.43	22.79
	1RB-Low (0)	715.3	24.43	23.61	22.53
		707.5	24.39	23.15	22.41
		699.7	24.48	23.20	22.42
	3RB-High (3)	715.3	24.40	23.59	22.32
		707.5	24.48	23.51	22.36
		699.7	24.35	23.46	22.29
	3RB-Middle (1)	715.3	24.54	23.64	22.45
		707.5	24.54	23.63	22.45
		699.7	24.51	23.63	22.35
	3RB-Low (0)	715.3	24.47	23.61	22.31
		707.5	24.47	23.54	22.38
		699.7	24.44	23.53	22.31
	6RB (0)	715.3	23.56	22.41	21.39
		707.5	23.54	22.69	21.42
		699.7	23.53	22.72	21.54
3MHz	1RB-High (14)	714.5	24.34	22.91	22.51
		707.5	24.32	23.08	22.30
		700.5	24.30	23.57	22.10
	1RB-Middle (7)	714.5	24.64	23.33	22.78
		707.5	24.61	23.53	22.67
		700.5	24.67	23.91	22.50
	1RB-Low (0)	714.5	24.48	23.15	22.63
		707.5	24.43	23.38	22.38
		700.5	24.48	23.71	22.13
	8RB-High (7)	714.5	23.48	22.45	21.34
		707.5	23.50	22.55	21.40
		700.5	23.48	22.57	21.45
	8RB-Middle (4)	714.5	23.59	22.54	21.51
		707.5	23.58	22.66	21.50
		700.5	23.58	22.68	21.58
	8RB-Low (0)	714.5	23.53	22.49	21.47
		707.5	23.52	22.60	21.48
		700.5	23.56	22.65	21.53
	15RB (0)	714.5	23.46	22.46	21.30
		707.5	23.49	22.59	21.49
		700.5	23.48	22.53	21.49
5MHz	1RB-High (24)	713.5	23.99	22.95	22.05
		707.5	24.14	23.11	22.63

		701.5	24.15	23.70	22.31
	1RB-Middle (12)	713.5	24.60	23.53	22.64
		707.5	24.81	23.69	22.89
		701.5	24.72	24.00	22.69
	1RB-Low (0)	713.5	24.24	23.24	22.18
		707.5	24.45	23.37	22.78
		701.5	24.36	23.81	22.23
	12RB-High (13)	713.5	23.44	22.51	21.43
		707.5	23.52	22.60	21.58
		701.5	23.49	22.57	21.45
	12RB-Middle (6)	713.5	23.56	22.65	21.54
		707.5	23.57	22.67	21.62
		701.5	23.58	22.68	21.53
	12RB-Low (0)	713.5	23.48	22.53	21.44
		707.5	23.51	22.60	21.50
		701.5	23.55	22.65	21.51
	25RB (0)	713.5	23.44	22.49	21.57
		707.5	23.53	22.59	21.46
		701.5	23.49	22.66	21.46
10MHz	1RB-High (49)	711	24.28	22.84	22.65
		707.5	24.24	23.00	22.20
		704	24.14	23.55	22.13
	1RB-Middle (24)	711	24.59	23.33	22.83
		707.5	24.62	23.54	22.63
		704	24.64	23.93	22.64
	1RB-Low (0)	711	24.38	23.14	22.65
		707.5	24.41	23.26	22.40
		704	24.43	23.63	22.31
	25RB-High (25)	711	23.54	22.62	21.45
		707.5	23.65	22.75	21.67
		704	23.56	22.65	21.76
	25RB-Middle (12)	711	23.53	22.66	21.59
		707.5	23.58	22.72	21.52
		704	23.58	22.65	21.71
	25RB-Low (0)	711	23.45	22.62	21.44
		707.5	23.60	22.71	21.54
		704	23.61	22.72	21.77
	50RB (0)	711	23.48	22.60	21.41
		707.5	23.62	22.67	21.56
		704	23.58	22.62	21.65

LTE band66 power level B1					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1779.3(132665)	21.22	21.00	21.62
		1745.0(132322)	21.33	21.64	21.80
		1710.7(131979)	21.51	21.27	21.90
	1RB-Middle (3)	1779.3(132665)	21.70	21.52	22.11
		1745.0(132322)	21.71	22.10	22.14
		1710.7(131979)	21.82	21.60	22.31
	1RB-Low (0)	1779.3(132665)	21.51	21.29	21.87
		1745.0(132322)	21.53	21.88	21.83
		1710.7(131979)	21.59	21.37	22.02
	3RB-High (3)	1779.3(132665)	21.41	21.61	21.84
		1745.0(132322)	21.62	21.90	22.01
		1710.7(131979)	21.77	21.75	22.18
	3RB-Middle (1)	1779.3(132665)	21.62	21.76	22.04
		1745.0(132322)	21.77	21.96	22.21
		1710.7(131979)	21.81	21.88	22.21
	3RB-Low (0)	1779.3(132665)	21.53	21.70	21.95
		1745.0(132322)	21.70	21.91	22.11
		1710.7(131979)	21.72	21.80	22.18
	6RB (0)	1779.3(132665)	21.58	21.73	21.35
		1745.0(132322)	21.65	21.50	21.24
		1710.7(131979)	21.75	21.88	21.21
3MHz	1RB-High (14)	1778.5(132657)	21.59	21.88	21.76
		1745.0(132322)	21.84	21.95	21.97
		1711.5(131987)	22.07	22.09	22.29
	1RB-Middle (7)	1778.5(132657)	22.22	22.38	22.09
		1745.0(132322)	22.33	22.45	22.41
		1711.5(131987)	22.51	22.54	22.58
	1RB-Low (0)	1778.5(132657)	21.96	22.04	21.85
		1745.0(132322)	22.01	22.19	22.23
		1711.5(131987)	22.21	22.29	22.38
	8RB-High (7)	1778.5(132657)	22.03	22.07	21.14
		1745.0(132322)	22.12	22.13	21.11
		1711.5(131987)	22.18	22.13	21.22
	8RB-Middle (4)	1778.5(132657)	22.12	22.15	21.22
		1745.0(132322)	22.21	22.24	21.18
		1711.5(131987)	22.23	22.21	21.30
	8RB-Low (0)	1778.5(132657)	22.06	22.14	21.19
		1745.0(132322)	22.15	22.19	21.11
		1711.5(131987)	22.22	22.16	21.25
	15RB (0)	1778.5(132657)	22.00	21.95	21.13
		1745.0(132322)	22.11	22.09	21.13
		1711.5(131987)	22.12	22.15	21.20
5MHz	1RB-High (24)	1777.5(132647)	21.61	22.09	21.77
		1745.0(132322)	21.59	21.62	22.03

		1712.5(131997)	21.84	21.82	21.93
	1RB-Middle (12)	1777.5(132647)	22.23	22.70	22.48
		1745.0(132322)	22.27	22.29	22.69
		1712.5(131997)	22.48	22.40	22.55
	1RB-Low (0)	1777.5(132647)	21.86	22.31	22.16
		1745.0(132322)	21.90	21.99	22.37
		1712.5(131997)	22.12	22.03	22.15
	12RB-High (13)	1777.5(132647)	22.03	22.06	21.04
		1745.0(132322)	22.12	22.15	21.22
		1712.5(131997)	22.19	22.22	21.25
	12RB-Middle (6)	1777.5(132647)	22.14	22.18	21.07
		1745.0(132322)	22.20	22.21	21.26
		1712.5(131997)	22.22	22.25	21.26
	12RB-Low (0)	1777.5(132647)	22.05	22.13	21.08
		1745.0(132322)	22.09	22.14	21.20
		1712.5(131997)	22.16	22.18	21.19
	25RB (0)	1777.5(132647)	22.03	22.11	21.09
		1745.0(132322)	22.11	22.07	21.17
		1712.5(131997)	22.18	22.15	21.16
10MHz	1RB-High (49)	1775.0(132622)	21.62	22.09	21.67
		1745.0(132322)	21.68	22.12	21.89
		1715.0(132022)	21.89	21.63	22.20
	1RB-Middle (24)	1775.0(132622)	22.10	22.45	22.10
		1745.0(132322)	22.13	22.55	22.36
		1715.0(132022)	22.23	22.02	22.52
	1RB-Low (0)	1775.0(132622)	21.95	22.27	21.85
		1745.0(132322)	21.98	22.33	22.15
		1715.0(132022)	22.06	21.82	22.28
	25RB-High (25)	1775.0(132622)	22.06	22.10	21.19
		1745.0(132322)	22.11	22.18	21.31
		1715.0(132022)	22.16	22.24	21.28
	25RB-Middle (12)	1775.0(132622)	22.11	22.15	21.23
		1745.0(132322)	22.14	22.15	21.31
		1715.0(132022)	22.23	22.35	21.31
	25RB-Low (0)	1775.0(132622)	22.14	22.16	21.29
		1745.0(132322)	22.08	22.19	21.26
		1715.0(132022)	22.10	22.26	21.24
	50RB (0)	1775.0(132622)	22.08	22.12	21.21
		1745.0(132322)	22.13	22.10	21.21
		1715.0(132022)	22.19	22.20	21.29
15MHz	1RB-High (74)	1772.5(132597)	21.82	21.44	21.52
		1745.0(132322)	21.63	21.66	21.94
		1717.5(132047)	21.81	22.12	21.72
	1RB-Middle (37)	1772.5(132597)	22.31	22.26	22.11
		1745.0(132322)	22.21	22.20	22.55
		1717.5(132047)	22.39	22.67	22.12

	1RB-Low (0)	1772.5(132597)	21.95	22.00	21.86
		1745.0(132322)	21.85	21.93	22.20
		1717.5(132047)	22.06	22.35	21.93
	36RB-High (38)	1772.5(132597)	22.12	22.02	21.17
		1745.0(132322)	22.25	22.21	21.23
		1717.5(132047)	22.32	22.25	21.33
	36RB-Middle (19)	1772.5(132597)	22.21	22.18	21.21
		1745.0(132322)	22.24	22.21	21.25
		1717.5(132047)	22.28	22.28	21.32
	36RB-Low (0)	1772.5(132597)	22.14	22.12	21.23
		1745.0(132322)	22.16	22.10	21.23
		1717.5(132047)	22.25	22.25	21.27
	75RB (0)	1772.5(132597)	22.12	22.10	21.19
		1745.0(132322)	22.20	22.15	21.15
		1717.5(132047)	22.25	22.23	21.22
20MHz	1RB-High (99)	1770.0(133572)	21.56	21.83	21.95
		1745.0(132322)	21.79	22.28	21.78
		1720.0(132072)	21.78	22.08	21.91
	1RB-Middle (50)	1770.0(133572)	22.20	22.46	22.27
		1745.0(132322)	22.33	22.81	22.53
		1720.0(132072)	22.34	22.64	22.52
	1RB-Low (0)	1770.0(133572)	21.89	22.11	22.26
		1745.0(132322)	21.97	22.46	22.13
		1720.0(132072)	22.01	22.26	22.13
	50RB-High (50)	1770.0(133572)	21.97	21.91	21.06
		1745.0(132322)	22.13	22.15	21.16
		1720.0(132072)	22.20	22.19	21.28
	50RB-Middle (25)	1770.0(133572)	22.09	22.04	21.11
		1745.0(132322)	22.16	22.18	21.17
		1720.0(132072)	22.27	22.26	21.26
	50RB-Low (0)	1770.0(133572)	22.13	22.08	21.12
		1745.0(132322)	22.10	22.12	21.12
		1720.0(132072)	22.24	22.23	21.26
	100RB (0)	1770.0(133572)	22.02	22.01	21.07
		1745.0(132322)	22.11	22.14	21.18
		1720.0(132072)	22.23	22.22	21.25

LTE band2 power level C1					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1909.3 (19193)	21.85	22.18	22.04
		1880 (18900)	21.86	21.61	21.58
		1850.7 (18607)	21.75	21.48	21.95
	1RB-Middle (3)	1909.3 (19193)	22.28	22.61	22.48
		1880 (18900)	22.18	21.93	22.04
		1850.7 (18607)	22.16	22.04	22.28
	1RB-Low (0)	1909.3 (19193)	22.06	22.38	22.19
		1880 (18900)	21.90	21.71	21.79
		1850.7 (18607)	21.95	21.78	22.07
	3RB-High (3)	1909.3 (19193)	22.18	22.39	22.32
		1880 (18900)	22.08	22.10	22.12
		1850.7 (18607)	21.94	22.14	22.06
	3RB-Middle (1)	1909.3 (19193)	22.29	22.48	22.46
		1880 (18900)	22.08	22.24	22.19
		1850.7 (18607)	22.09	22.31	22.17
	3RB-Low (0)	1909.3 (19193)	22.22	22.42	22.39
		1880 (18900)	22.03	22.15	22.09
		1850.7 (18607)	22.05	22.25	22.00
	6RB (0)	1909.3 (19193)	22.18	22.03	22.07
		1880 (18900)	22.02	22.18	21.30
		1850.7 (18607)	22.06	22.04	21.15
3MHz	1RB-High (14)	1908.5 (19185)	21.91	22.29	22.19
		1880 (18900)	21.82	21.54	21.69
		1851.5 (18615)	21.77	21.63	21.87
	1RB-Middle (7)	1908.5 (19185)	22.30	22.65	22.53
		1880 (18900)	22.19	22.00	22.06
		1851.5 (18615)	22.11	22.15	22.34
	1RB-Low (0)	1908.5 (19185)	22.08	22.40	22.28
		1880 (18900)	21.98	21.78	21.78
		1851.5 (18615)	21.89	21.95	22.15
	8RB-High (7)	1908.5 (19185)	22.14	22.21	21.16
		1880 (18900)	22.01	21.98	21.06
		1851.5 (18615)	22.05	22.04	21.06
	8RB-Middle (4)	1908.5 (19185)	22.22	22.32	21.28
		1880 (18900)	22.08	22.06	21.13
		1851.5 (18615)	22.09	22.14	21.08
	8RB-Low (0)	1908.5 (19185)	22.19	22.27	21.21
		1880 (18900)	22.01	22.01	21.11
		1851.5 (18615)	22.06	22.09	21.06
	15RB (0)	1908.5 (19185)	22.15	22.13	21.16
		1880 (18900)	22.02	22.00	21.08
		1851.5 (18615)	22.04	22.07	21.08
5MHz	1RB-High (24)	1907.5 (19175)	21.88	22.37	21.89
		1880 (18900)	21.52	21.60	21.95

		1852.5 (18625)	21.71	21.72	21.82
	1RB-Middle (12)	1907.5 (19175)	22.42	22.88	22.52
		1880 (18900)	22.16	22.19	22.60
		1852.5 (18625)	22.30	22.26	22.36
	1RB-Low (0)	1907.5 (19175)	21.93	22.41	22.18
		1880 (18900)	21.81	21.87	22.28
		1852.5 (18625)	21.98	21.93	22.05
	12RB-High (13)	1907.5 (19175)	22.14	22.17	21.10
		1880 (18900)	21.99	22.04	21.06
		1852.5 (18625)	22.04	22.08	21.06
	12RB-Middle (6)	1907.5 (19175)	22.24	22.32	21.20
		1880 (18900)	22.10	22.16	21.13
		1852.5 (18625)	22.12	22.14	21.10
	12RB-Low (0)	1907.5 (19175)	22.16	22.19	21.12
		1880 (18900)	22.01	22.10	21.11
		1852.5 (18625)	22.04	22.07	21.06
	25RB (0)	1907.5 (19175)	22.15	22.20	21.15
		1880 (18900)	22.01	22.05	21.08
		1852.5 (18625)	22.05	22.08	21.02
10MHz	1RB-High (49)	1905 (19150)	21.78	22.21	22.01
		1880 (18900)	21.78	21.49	22.01
		1855 (18650)	21.75	21.60	21.85
	1RB-Middle (24)	1905 (19150)	22.19	22.58	22.40
		1880 (18900)	22.15	21.94	22.41
		1855 (18650)	22.10	22.10	22.28
	1RB-Low (0)	1905 (19150)	22.01	22.31	22.13
		1880 (18900)	21.89	21.66	22.11
		1855 (18650)	21.88	21.90	21.80
	25RB-High (25)	1905 (19150)	22.18	22.17	21.31
		1880 (18900)	22.01	22.14	21.09
		1855 (18650)	22.12	22.24	21.26
	25RB-Middle (12)	1905 (19150)	22.18	22.20	21.36
		1880 (18900)	22.01	22.15	21.11
		1855 (18650)	22.09	22.15	21.19
	25RB-Low (0)	1905 (19150)	22.23	22.26	21.32
		1880 (18900)	22.06	22.12	21.13
		1855 (18650)	22.06	22.10	21.13
	50RB (0)	1905 (19150)	22.16	22.17	21.14
		1880 (18900)	22.05	22.07	21.08
		1855 (18650)	22.11	22.10	21.15
15MHz	1RB-High (74)	1902.5 (19125)	21.74	21.75	22.01
		1880 (18900)	21.59	21.95	21.51
		1857.5 (18675)	21.62	21.43	22.08
	1RB-Middle (37)	1902.5 (19125)	22.19	22.16	22.51
		1880 (18900)	22.13	22.54	22.06
		1857.5 (18675)	22.23	22.27	22.45

	1RB-Low (0)	1902.5 (19125)	21.89	21.85	22.14
		1880 (18900)	21.85	22.18	21.71
		1857.5 (18675)	21.92	22.01	22.23
	36RB-High (38)	1902.5 (19125)	22.19	22.18	21.21
		1880 (18900)	22.05	22.05	21.06
		1857.5 (18675)	22.15	22.13	21.15
	36RB-Middle (19)	1902.5 (19125)	22.25	22.20	21.25
		1880 (18900)	22.05	22.04	21.06
		1857.5 (18675)	22.09	22.08	21.11
	36RB-Low (0)	1902.5 (19125)	22.23	22.18	21.24
		1880 (18900)	22.10	22.03	21.11
		1857.5 (18675)	22.05	22.00	21.04
	75RB (0)	1902.5 (19125)	22.18	22.21	21.16
		1880 (18900)	22.09	22.07	21.10
		1857.5 (18675)	22.05	22.04	21.14
20MHz	1RB-High (99)	1900 (19100)	21.78	22.21	21.98
		1880 (18900)	21.66	21.92	22.11
		1860 (18700)	21.57	21.88	21.70
	1RB-Middle (50)	1900 (19100)	22.31	22.75	22.51
		1880 (18900)	22.21	22.51	22.68
		1860 (18700)	22.26	22.45	22.34
	1RB-Low (0)	1900 (19100)	21.87	22.35	22.15
		1880 (18900)	21.83	22.12	22.17
		1860 (18700)	21.90	22.16	22.03
	50RB-High (50)	1900 (19100)	22.09	22.14	21.13
		1880 (18900)	21.99	22.01	21.09
		1860 (18700)	22.11	22.13	21.16
	50RB-Middle (25)	1900 (19100)	22.16	22.19	21.23
		1880 (18900)	22.04	22.08	21.02
		1860 (18700)	22.15	22.09	21.11
	50RB-Low (0)	1900 (19100)	22.19	22.17	21.21
		1880 (18900)	22.08	22.08	21.06
		1860 (18700)	21.95	21.93	21.03
	100RB (0)	1900 (19100)	22.14	22.14	21.16
		1880 (18900)	22.05	22.09	21.06
		1860 (18700)	22.11	22.10	21.07

LTE band66 power level C1					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
1.4MHz	1RB-High (5)	1779.3(132665)	20.30	20.06	20.58
		1745.0(132322)	20.36	20.72	20.84
		1710.7(131979)	20.53	20.35	20.90
	1RB-Middle (3)	1779.3(132665)	20.72	20.59	20.60
		1745.0(132322)	20.73	21.14	21.19
		1710.7(131979)	20.82	20.63	21.31
	1RB-Low (0)	1779.3(132665)	20.53	20.34	20.80
		1745.0(132322)	20.55	20.92	21.02
		1710.7(131979)	20.59	20.41	21.07
	3RB-High (3)	1779.3(132665)	20.48	20.65	20.89
		1745.0(132322)	20.66	20.95	21.11
		1710.7(131979)	20.78	20.80	21.20
	3RB-Middle (1)	1779.3(132665)	20.64	20.80	21.09
		1745.0(132322)	20.78	21.02	21.22
		1710.7(131979)	20.83	20.92	21.15
	3RB-Low (0)	1779.3(132665)	20.57	20.70	21.01
		1745.0(132322)	20.71	20.96	21.13
		1710.7(131979)	20.72	20.82	21.18
	6RB (0)	1779.3(132665)	20.61	20.77	21.07
		1745.0(132322)	20.66	20.57	21.11
		1710.7(131979)	20.66	20.90	21.11
3MHz	1RB-High (14)	1778.5(132657)	20.75	21.16	20.73
		1745.0(132322)	20.91	20.71	20.95
		1711.5(131987)	20.93	21.32	21.23
	1RB-Middle (7)	1778.5(132657)	21.16	21.54	21.09
		1745.0(132322)	21.17	21.18	21.42
		1711.5(131987)	21.32	21.69	21.53
	1RB-Low (0)	1778.5(132657)	20.99	21.31	20.84
		1745.0(132322)	20.96	20.98	21.23
		1711.5(131987)	21.10	21.44	21.33
	8RB-High (7)	1778.5(132657)	21.00	21.08	21.10
		1745.0(132322)	21.06	21.09	21.07
		1711.5(131987)	21.11	21.21	21.20
	8RB-Middle (4)	1778.5(132657)	21.09	21.16	21.23
		1745.0(132322)	21.13	21.22	21.12
		1711.5(131987)	21.27	21.32	21.28
	8RB-Low (0)	1778.5(132657)	20.99	21.15	21.12
		1745.0(132322)	21.09	21.14	21.05
		1711.5(131987)	21.16	21.30	21.27
	15RB (0)	1778.5(132657)	20.98	21.02	21.11
		1745.0(132322)	21.12	21.10	21.10
		1711.5(131987)	21.11	21.15	21.24
5MHz	1RB-High (24)	1777.5(132647)	20.66	21.11	20.73
		1745.0(132322)	20.52	20.61	21.00

		1712.5(131997)	20.79	20.84	20.91
	1RB-Middle (12)	1777.5(132647)	21.18	21.61	21.45
		1745.0(132322)	21.23	21.28	21.70
		1712.5(131997)	21.45	21.41	21.54
	1RB-Low (0)	1777.5(132647)	20.82	21.22	21.11
		1745.0(132322)	20.91	20.95	21.33
		1712.5(131997)	21.05	21.05	21.14
	12RB-High (13)	1777.5(132647)	21.02	21.12	21.01
		1745.0(132322)	21.09	21.18	21.15
		1712.5(131997)	21.16	21.21	21.19
	12RB-Middle (6)	1777.5(132647)	21.09	21.15	21.08
		1745.0(132322)	21.18	21.21	21.22
		1712.5(131997)	21.22	21.25	21.22
	12RB-Low (0)	1777.5(132647)	21.03	21.13	21.05
		1745.0(132322)	21.07	21.09	21.15
		1712.5(131997)	21.15	21.20	21.17
	25RB (0)	1777.5(132647)	21.03	21.08	21.09
		1745.0(132322)	21.09	21.05	21.13
		1712.5(131997)	21.16	21.18	21.13
10MHz	1RB-High (49)	1775.0(132622)	20.71	20.46	20.66
		1745.0(132322)	20.73	20.63	20.87
		1715.0(132022)	20.74	21.18	21.13
	1RB-Middle (24)	1775.0(132622)	21.10	20.91	21.14
		1745.0(132322)	21.18	21.09	21.40
		1715.0(132022)	21.28	21.61	21.56
	1RB-Low (0)	1775.0(132622)	20.91	20.73	20.80
		1745.0(132322)	20.96	20.96	21.14
		1715.0(132022)	21.06	21.37	21.22
	25RB-High (25)	1775.0(132622)	21.01	21.14	21.15
		1745.0(132322)	21.12	21.24	21.26
		1715.0(132022)	21.17	21.25	21.23
	25RB-Middle (12)	1775.0(132622)	21.09	21.14	21.20
		1745.0(132322)	21.18	21.27	21.26
		1715.0(132022)	21.21	21.28	21.28
	25RB-Low (0)	1775.0(132622)	21.11	21.21	21.22
		1745.0(132322)	21.14	21.12	21.22
		1715.0(132022)	21.17	21.23	21.25
	50RB (0)	1775.0(132622)	21.11	21.13	21.15
		1745.0(132322)	21.09	21.13	21.13
		1715.0(132022)	21.18	21.24	21.22
15MHz	1RB-High (74)	1772.5(132597)	20.62	20.63	20.51
		1745.0(132322)	20.66	21.02	21.11
		1717.5(132047)	20.78	20.70	21.03
	1RB-Middle (37)	1772.5(132597)	21.13	21.18	21.05
		1745.0(132322)	21.24	21.66	21.70
		1717.5(132047)	21.36	21.40	21.60

	1RB-Low (0)	1772.5(132597)	20.89	20.87	20.80
		1745.0(132322)	20.88	21.33	21.28
		1717.5(132047)	21.02	21.06	21.26
	36RB-High (38)	1772.5(132597)	21.11	21.08	21.13
		1745.0(132322)	21.19	21.21	21.19
		1717.5(132047)	21.34	21.22	21.23
	36RB-Middle (19)	1772.5(132597)	21.15	21.22	21.14
		1745.0(132322)	21.21	21.17	21.13
		1717.5(132047)	21.28	21.25	21.30
	36RB-Low (0)	1772.5(132597)	21.16	21.19	21.22
		1745.0(132322)	21.18	21.10	21.26
		1717.5(132047)	21.23	21.18	21.22
	75RB (0)	1772.5(132597)	21.12	21.14	21.17
		1745.0(132322)	21.15	21.16	21.21
		1717.5(132047)	21.22	21.21	21.18
20MHz	1RB-High (99)	1770.0(133572)	20.59	20.85	20.66
		1745.0(132322)	20.74	21.22	21.12
		1720.0(132072)	20.78	21.06	20.83
	1RB-Middle (50)	1770.0(133572)	21.26	21.44	21.39
		1745.0(132322)	21.33	21.81	21.70
		1720.0(132072)	21.34	21.66	21.53
	1RB-Low (0)	1770.0(133572)	20.93	21.15	21.03
		1745.0(132322)	21.09	21.56	21.51
		1720.0(132072)	20.99	21.31	21.13
	50RB-High (50)	1770.0(133572)	20.98	20.97	21.06
		1745.0(132322)	21.13	21.19	21.11
		1720.0(132072)	21.22	21.24	21.22
	50RB-Middle (25)	1770.0(133572)	21.13	21.08	21.08
		1745.0(132322)	21.16	21.20	21.16
		1720.0(132072)	21.28	21.25	21.25
	50RB-Low (0)	1770.0(133572)	21.16	21.13	21.16
		1745.0(132322)	21.10	21.13	21.10
		1720.0(132072)	21.21	21.23	21.21
	100RB (0)	1770.0(133572)	21.06	21.08	21.05
		1745.0(132322)	21.15	21.12	21.15
		1720.0(132072)	21.22	21.21	21.19

13.5 Wi-Fi and BT Measurement Result

The maximum output power of BT antenna is **10.52dBm**.
The maximum tune up of BT antenna is **11.0dBm.**

The average conducted power for Wi-Fi 2.4G is as following-Normal power:

802.11b(dBm)	
Channel\data rate	1Mbps
11(2462MHz)	18.81
6(2437MHz)	18.92
1(2412MHz)	18.49
Tune up	19.50
802.11g(dBm)	
Channel\data rate	6Mbps
11(2462MHz)	16.31
6(2437MHz)	16.52
1(2412MHz)	16.24
Tune up	17.00
802.11n(dBm)-20MHz	
Channel\data rate	MCS0
11(2462MHz)	16.55
6(2437MHz)	16.51
1(2412MHz)	16.36
Tune up	17.00
802.11n(dBm)-40MHz	
Channel\data rate	MCS0
9(2452MHz)	16.18
6(2437MHz)	16.33
3(2422MHz)	16.19
Tune up	17.00

14.SAR Test Result

14.1. SAR Result

Table 14.1-1: SAR Values(GSM 850MHz-Head)

Frequency MHz	Frequency Ch.	Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
836.6	190	Speech	Cheek Left	0	33.14	33.30	0.209	**0.22**	-0.12
836.6	190	Speech	Tilt Left	0	33.14	33.30	0.11	**0.11**	-0.09
836.6	190	Speech	Cheek Right	0	33.14	33.30	0.183	**0.18**	0.19
836.6	190	Speech	Tilt Right	0	33.14	33.30	0.118	**0.12**	0.10
824.2	128	Speech	Cheek Left	0	33.10	33.30	0.085	**0.09**	0.13
848.8	251	Speech	Cheek Left	0	33.05	33.30	0.091	**0.10**	0.17

Note: This max SAR value zoom scan graph is Fig A.1

Table 14.1-2: SAR Values(GSM 850MHz-Body)

Frequency MHz	Frequency Ch.	Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
836.6	190	GPRS 4TX	Front	10	27.90	28	0.237	**0.24**	-0.03
836.6	190	GPRS 4TX	Rear	10	27.90	28	0.611	**0.63**	0.02
836.6	190	GPRS 4TX	Left	10	27.90	28	0.205	**0.21**	-0.06
836.6	190	GPRS 4TX	Right	10	27.90	28	0.076	**0.08**	0.10
836.6	190	GPRS 4TX	Bottom	10	27.90	28	0.13	**0.13**	0.05
824.2	128	GPRS 4TX	Rear	10	27.84	28	0.645	**0.67**	0.12
848.8	251	GPRS 4TX	Rear	10	27.82	28	0.533	**0.56**	0.12
824.2	128	EGPRS 4TX(GMSK)	Rear	10	27.84	28	0.479	**0.50**	-0.06

Note: This max SAR value zoom scan graph is Fig A.2

Table 14.1-3: SAR Values(GSM 1900MHz-Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	661	Speech	Cheek Left	0	29.94	31	0.074	**0.09**	0.16
1880	661	Speech	Tilt Left	0	29.94	31	0.037	**0.05**	-0.13
1880	661	Speech	Cheek Right	0	29.94	31	0.109	**0.14**	0.11
1880	661	Speech	Tilt Right	0	29.94	31	0.048	**0.06**	-0.13
1909.8	810	Speech	Cheek Right	0	30.03	31	0.114	**0.14**	0.17
1850.2	512	Speech	Cheek Right	0	29.86	31	0.116	**0.15**	0.14

Note: This max SAR value zoom scan graph is Fig A.3

Table 14.1-4: SAR Values(GSM 1900MHz-Body Worn)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	661	GPRS 4TX	Front	15	23.31	24	0.136	**0.16**	-0.11
1880	661	GPRS 4TX	Rear	15	23.31	24	0.199	**0.23**	0.12
1909.8	810	GPRS 4TX	Rear	15	23.51	24	0.200	**0.22**	0.13
1850.2	512	GPRS 4TX	Rear	15	23.16	24	0.204	**0.25**	0.15
1850.2	512	EGPRS 4TX （GMSK）	Rear	15	23.16	24	0.189	**0.23**	0.06

Note: This max SAR value zoom scan graph is Fig A.5

Table 14.1-5: SAR Values(GSM 1900MHz-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	661	GPRS 4TX	Front	10	22.24	23	0.183	**0.22**	0.18
1880	661	GPRS 4TX	Rear	10	22.24	23	0.363	**0.43**	0.18
1880	661	GPRS 4TX	Left	10	22.24	23	0.078	**0.09**	0.08
1880	661	GPRS 4TX	Right	10	22.24	23	0.137	**0.16**	0.11
1880	661	GPRS 4TX	Bottom	10	22.24	23	0.267	**0.32**	0.16
1909.8	810	GPRS 4TX	Rear	10	22.47	23	0.198	**0.22**	0.05
1850.2	512	GPRS 4TX	Rear	10	22.18	23	0.231	**0.28**	0.13
1880	661	EGPRS 4TX （GMSK）	Rear	10	22.20	23	0.335	**0.40**	0.11

Note: This max SAR value zoom scan graph is Fig A.4

Table 14.1-6: SAR Values(WCDMA1900-Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	9400	RMC12.2K	Cheek Left	0	23.85	25	0.360	**0.47**	0.14
1880	9400	RMC12.2K	Tilt Left	0	23.85	25	0.018	**0.02**	0.19
1880	9400	RMC12.2K	Cheek Right	0	23.85	25	0.423	**0.55**	0.08
1880	9400	RMC12.2K	Tilt Right	0	23.85	25	0.124	**0.16**	0.14
1852.4	9262	RMC12.2K	Cheek Right	0	23.82	25	0.364	**0.48**	0.09
1907.6	9538	RMC12.2K	Cheek Right	0	23.92	25	0.370	**0.47**	0.15

Note: This max SAR value zoom scan graph is Fig A.6

Table 14.1-7: SAR Values(WCDMA 1900-Body Worn)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	9400	RMC12.2K	Front	15	21.61	23	0.253	**0.35**	0.13
1880	9400	RMC12.2K	Rear	15	21.61	23	0.352	**0.48**	0.16
1852.4	9262	RMC12.2K	Rear	15	21.63	23	0.350	**0.48**	0.15
1907.6	9538	RMC12.2K	Rear	15	21.73	23	0.337	**0.45**	0.13

Note: This max SAR value zoom scan graph is Fig A.8

Table 14.1-8: SAR Values(WCDMA 1900-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	9400	RMC12.2K	Front	10	20.62	22	0.288	**0.40**	-0.05
1880	9400	RMC12.2K	Rear	10	20.62	22	0.429	**0.59**	-0.01
1880	9400	RMC12.2K	Left	10	20.62	22	0.103	**0.14**	-0.01
1880	9400	RMC12.2K	Right	10	20.62	22	0.199	**0.27**	0.05
1880	9400	RMC12.2K	Bottom	10	20.62	22	0.345	**0.47**	-0.05
1852.4	9262	RMC12.2K	Rear	10	20.65	22	0.307	**0.42**	0.04
1907.6	9538	RMC12.2K	Rear	10	20.72	22	0.276	**0.37**	0.03

Note: This max SAR value zoom scan graph is Fig A.7

Table 14.1-9: SAR Values(WCDMA 1700—Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1732.4	1412	RMC12.2K	Cheek Left	0	23.86	25	0.276	**0.36**	0.14
1732.4	1412	RMC12.2K	Tilt Left	0	23.86	25	0.111	**0.14**	-0.11
1732.4	1412	RMC12.2K	Cheek Right	0	23.86	25	0.288	**0.37**	0.10
1732.4	1412	RMC12.2K	Tilt Right	0	23.86	25	0.116	**0.15**	0.04
1752.6	1513	RMC12.2K	Cheek Right	0	23.89	25	0.315	**0.41**	-0.01
1712.4	1312	RMC12.2K	Cheek Right	0	23.85	25	0.250	**0.33**	0.05

Note: This max SAR value zoom scan graph is Fig A.9

Table 14.1-10: SAR Values(WCDMA1700-Body-Worn)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1732.4	1412	RMC12.2K	Front	15	21.73	23	0.281	**0.38**	0.01
1732.4	1412	RMC12.2K	Rear	15	21.73	23	0.399	**0.53**	-0.01
1712.4	1312	RMC12.2K	Rear	15	21.84	23	0.405	**0.53**	-0.00
1752.6	1513	RMC12.2K	Rear	15	21.75	23	0.395	**0.53**	-0.01

Note: This max SAR value zoom scan graph is Fig A.11

Table 14.1-11: SAR Values(WCDMA 1700-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1732.4	1412	RMC12.2K	Front	10	20.74	22	0.280	**0.37**	-0.08
1732.4	1412	RMC12.2K	Rear	10	20.74	22	0.427	**0.57**	0.05
1732.4	1412	RMC12.2K	Left	10	20.74	22	0.063	**0.08**	-0.01
1732.4	1412	RMC12.2K	Right	10	20.74	22	0.153	**0.20**	0.12
1732.4	1412	RMC12.2K	Bottom	10	20.74	22	0.305	**0.41**	-0.08
1712.4	1312	RMC12.2K	Rear	10	20.86	22	0.483	**0.63**	0.00
1752.6	1513	RMC12.2K	Rear	10	20.75	22	0.487	**0.65**	-0.02

Note: This max SAR value zoom scan graph is Fig A.10

Table 14.1-12: SAR Values(WCDMA 850—Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.6	4183	RMC12.2K	Cheek Left	0	22.61	23	0.688	**0.75**	0.06
836.6	4183	RMC12.2K	Tilt Left	0	22.61	23	0.485	**0.53**	0.04
836.6	4183	RMC12.2K	Cheek Right	0	22.61	23	0.431	**0.47**	0.01
836.6	4183	RMC12.2K	Tilt Right	0	22.61	23	0.313	**0.34**	-0.03
846.6	4233	RMC12.2K	Cheek Left	0	22.64	23	0.589	**0.64**	0.04
826.4	4132	RMC12.2K	Cheek Left	0	22.65	23	0.751	**0.81**	0.06
826.4	4132	RMC12.2K	Cheek Left	0	22.65	23	0.611	**0.66**	-0.02

Note1: This max SAR value zoom scan graph is Fig A.12
Note2: The battery for TLi028C1 reported SAR is 0.66 W/kg when in WCDMA850 left cheek position

Table 14.1-13: SAR Values(WCDMA 850-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.6	4183	RMC12.2K	Front	10	24.67	25	0.416	**0.45**	0.09
836.6	4183	RMC12.2K	Rear	10	24.67	25	0.694	**0.75**	0.04
836.6	4183	RMC12.2K	Left	10	24.67	25	0.508	**0.55**	-0.04
836.6	4183	RMC12.2K	Right	10	24.67	25	0.722	**0.78**	0.17
836.6	4183	RMC12.2K	Top	10	24.67	25	0.316	**0.34**	0.03
846.6	4233	RMC12.2K	Right	10	24.72	25	0.721	**0.77**	0.05
826.4	4132	RMC12.2K	Right	10	24.66	25	0.663	**0.72**	-0.08

Note1: This max SAR value zoom scan graph is Fig A.13

Table 14.1-14: SAR Values(LTE Band2—Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1900	19100	20M_QPSK_1@Mid	Cheek Left	0	24.44	25	0.379	0.43	0.00
1900	19100	20M_QPSK_1@Mid	Tilt Left	0	24.44	25	0.199	**0.23**	-0.14
1900	19100	20M_QPSK_1@Mid	Cheek Right	0	24.44	25	0.297	**0.34**	0.16
1900	19100	20M_QPSK_1@Mid	Tilt Right	0	24.44	25	0.136	**0.15**	0.11
1900	19100	20M_QPSK_50@Mid	Cheek Left	0	23.28	24	0.303	**0.36**	0.07
1900	19100	20M_QPSK_50@Mid	Tilt Left	0	23.28	24	0.148	**0.17**	0.18
1900	19100	20M_QPSK_50@Mid	Cheek Right	0	23.28	24	0.327	**0.39**	-0.06
1900	19100	20M_QPSK_50@Mid	Tilt Right	0	23.28	24	0.099	**0.12**	0.17

Note1: This max SAR value zoom scan graph is Fig A.14

Table 14.1-15: SAR Values(LTE Band2-Body-Worn)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1900	19100	20M_QPSK_1@Mid	Front	15	23.32	24	0.261	**0.31**	0.14
1900	19100	20M_QPSK_1@Mid	Rear	15	23.32	24	0.321	**0.38**	0.11
1900	19100	20M_QPSK_50@Mid	Front	15	23.18	24	0.244	**0.29**	0.01
1900	19100	20M_QPSK_50@Mid	Rear	15	23.18	24	0.349	0.42	0.01

Note1: This max SAR value zoom scan graph is Fig A.16

Table 14.1-16: SAR Values(LTE Band2-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1900	19100	20M_QPSK_1@Mid	Front	10	22.31	23	0.335	**0.39**	0.04
1900	19100	20M_QPSK_1@Mid	Rear	10	22.31	23	0.667	0.78	0.01
1900	19100	20M_QPSK_1@Mid	Left	10	22.31	23	0.138	**0.16**	-0.16
1900	19100	20M_QPSK_1@Mid	Right	10	22.31	23	0.224	**0.26**	-0.02
1900	19100	20M_QPSK_1@Mid	Bottom	10	22.31	23	0.446	**0.52**	0.06
1900	19100	20M_QPSK_50@Mid	Front	10	22.19	23	0.338	**0.41**	0.12
1900	19100	20M_QPSK_50@Mid	Rear	10	22.19	23	0.600	**0.72**	0.01

1900	19100	20M_QPSK_50@Mid	Left	10	22.19	23	0.147	**0.18**	-0.02
1900	19100	20M_QPSK_50@Mid	Right	10	22.19	23	0.222	**0.27**	0.06
1900	19100	20M_QPSK_50@Mid	Bottom	10	22.19	23	0.435	**0.52**	0.07

Note1: This max SAR value zoom scan graph is Fig A.15

Table 14.1-17: SAR Values(LTE Band5—Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
829	20450	10M_QPSK_1@Mid	Cheek Left	0	22.85	23	0.746	**0.77**	0.10
829	20450	10M_QPSK_1@Mid	Tilt Left	0	22.85	23	0.403	**0.42**	0.05
829	20450	10M_QPSK_1@Mid	Cheek Right	0	22.85	23	0.435	**0.45**	0.02
829	20450	10M_QPSK_1@Mid	Tilt Right	0	22.85	23	0.287	**0.30**	0.04
836.5	20525	10M_QPSK_25@High	Cheek Left	0	22.86	23	0.767	**0.79**	-0.03
836.5	20525	10M_QPSK_25@High	Tilt Left	0	22.86	23	0.554	**0.57**	0.01
836.5	20525	10M_QPSK_25@High	Cheek Right	0	22.86	23	0.427	**0.44**	0.01
836.5	20525	10M_QPSK_25@High	Tilt Right	0	22.86	23	0.305	**0.31**	0.09

Note1: This max SAR value zoom scan graph is Fig A.17

Table 14.1-18: SAR Values(LTE Band5-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
844	20600	10M_QPSK_1@Mid	Front	10	24.84	25	0.290	**0.30**	-0.03
844	20600	10M_QPSK_1@Mid	Rear	10	24.84	25	0.662	**0.69**	-0.10
844	20600	10M_QPSK_1@Mid	Left	10	24.84	25	0.556	**0.58**	0.00
844	20600	10M_QPSK_1@Mid	Right	10	24.84	25	0.754	**0.78**	0.01
844	20600	10M_QPSK_1@Mid	Top	10	24.84	25	0.454	**0.47**	0.00
829	20450	10M_QPSK_25@Low	Front	10	23.59	24	0.263	**0.29**	0.02
829	20450	10M_QPSK_25@Low	Rear	10	23.59	24	0.454	**0.50**	0.02
829	20450	10M_QPSK_25@Low	Left	10	23.59	24	0.393	**0.43**	-0.03
829	20450	10M_QPSK_25@Low	Right	10	23.59	24	0.558	**0.61**	0.00
829	20450	10M_QPSK_25@Low	Top	10	23.59	24	0.279	**0.31**	0.04

Note1: This max SAR value zoom scan graph is Fig A.18

Table 14.1-19: SAR Values(LTE Band12—Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
704	23060	10M_QPSK_1@Mid	Cheek Left	0	22.82	23	0.456	0.48	-0.03
704	23060	10M_QPSK_1@Mid	Tilt Left	0	22.82	23	0.313	**0.33**	0.01
704	23060	10M_QPSK_1@Mid	Cheek Right	0	22.82	23	0.337	**0.35**	-0.08
704	23060	10M_QPSK_1@Mid	Tilt Right	0	22.82	23	0.110	**0.11**	0.10
707.5	23095	10M_QPSK_25@High	Cheek Left	0	22.9	23	0.392	**0.40**	0.01
707.5	23095	10M_QPSK_25@High	Tilt Left	0	22.9	23	0.331	**0.34**	0.04
707.5	23095	10M_QPSK_25@High	Cheek Right	0	22.9	23	0.346	**0.35**	0.07
707.5	23095	10M_QPSK_25@High	Tilt Right	0	22.9	23	0.107	**0.11**	0.13

Note1: This max SAR value zoom scan graph is Fig A.19

Table 14.1-20: SAR Values(LTE Band12-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
704	23060	10M_QPSK_1@Mid	Front	10	24.64	25	0.208	**0.23**	-0.08
704	23060	10M_QPSK_1@Mid	Rear	10	24.64	25	0.505	0.55	0.00
704	23060	10M_QPSK_1@Mid	Left	10	24.64	25	0.275	**0.30**	-0.06
704	23060	10M_QPSK_1@Mid	Right	10	24.64	25	0.474	**0.51**	-0.01
704	23060	10M_QPSK_1@Mid	Top	10	24.64	25	0.144	**0.16**	-0.01
707.5	23095	10M_QPSK_25@High	Front	10	23.65	24	0.228	**0.25**	0.04
707.5	23095	10M_QPSK_25@High	Rear	10	23.65	24	0.397	**0.43**	0.01
707.5	23095	10M_QPSK_25@High	Left	10	23.65	24	0.227	**0.25**	0.03
707.5	23095	10M_QPSK_25@High	Right	10	23.65	24	0.388	**0.42**	-0.03
707.5	23095	10M_QPSK_25@High	Top	10	23.65	24	0.118	**0.13**	0.04

Note1: This max SAR value zoom scan graph is Fig A.20

Table 14.1-21: SAR Values(LTE Band 66—Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1720	132072	20M_QPSK_1@Mid	Cheek Left	0	24.60	25	0.297	**0.33**	0.04
1720	132072	20M_QPSK_1@Mid	Tilt Left	0	24.60	25	0.136	**0.15**	0.15
1720	132072	20M_QPSK_1@Mid	Cheek Right	0	24.60	25	0.302	**0.33**	0.18
1720	132072	20M_QPSK_1@Mid	Tilt Right	0	24.60	25	0.133	**0.15**	0.18
1720	132072	20M_QPSK_50@Low	Cheek Left	0	23.41	24	0.199	**0.23**	0.03
1720	132072	20M_QPSK_50@Low	Tilt Left	0	23.41	24	0.099	**0.11**	0.07
1720	132072	20M_QPSK_50@Low	Cheek Right	0	23.41	24	0.264	**0.30**	0.14
1720	132072	20M_QPSK_50@Low	Tilt Right	0	23.41	24	0.098	**0.11**	0.11

Note1: This max SAR value zoom scan graph is Fig A.26

Table 14.1-22: SAR Values(LTE Band 66-Body-Worn)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1720	132072	20M_QPSK_1@Mid	Front	15	22.34	23	0.260	**0.30**	0.03
1720	132072	20M_QPSK_1@Mid	Rear	15	22.34	23	0.290	**0.34**	0.13
1720	132072	20M_QPSK_50@Mid	Front	15	22.27	23	0.242	**0.29**	0.10
1720	132072	20M_QPSK_50@Mid	Rear	15	22.27	23	0.298	**0.35**	0.01

Note1: This max SAR value zoom scan graph is Fig A.28

Table 14.1-23: SAR Values(LTE Band 66-Body-Hotspot)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1720	132072	20M_QPSK_1@Mid	Front	10	21.34	22	0.299	**0.35**	0.03
1720	132072	20M_QPSK_1@Mid	Rear	10	21.34	22	0.472	**0.55**	-0.03
1720	132072	20M_QPSK_1@Mid	Left	10	21.34	22	0.059	**0.07**	-0.03
1720	132072	20M_QPSK_1@Mid	Right	10	21.34	22	0.140	**0.16**	0.12
1720	132072	20M_QPSK_1@Mid	Bottom	10	21.34	22	0.298	**0.35**	0.01
1720	132072	20M_QPSK_50@Mid	Front	10	21.28	22	0.290	**0.34**	0.11
1720	132072	20M_QPSK_50@Mid	Rear	10	21.28	22	0.456	**0.54**	-0.05
1720	132072	20M_QPSK_50@Mid	Left	10	21.28	22	0.059	**0.07**	0.02
1720	132072	20M_QPSK_50@Mid	Right	10	21.28	22	0.137	**0.16**	0.17
1720	132072	20M_QPSK_50@Mid	Bottom	10	21.28	22	0.289	**0.34**	0.09

Note1: This max SAR value zoom scan graph is Fig A.27

Table 14.1-24: SAR Values(WLAN—Head)-802.11b

Frequency		Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Duty Cycle	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
2437	6	Cheek Left	0	18.92	19.50	99.0%	0.115	**0.13**	0.01
2437	6	Tilt Left	0	18.92	19.50	99.0%	0.108	**0.12**	0.04
2437	6	Cheek Right	0	18.92	19.50	99.0%	0.261	**0.30**	0.09
2437	6	Tilt Right	0	18.92	19.50	99.0%	0.168	**0.19**	0.09

Note1: This max SAR value zoom scan graph is Fig A.32

Table 14.1-25: SAR Values(WLAN—Body)-802.11b

Frequency		Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Duty Cycle	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
2437	6	Front	10	18.92	19.50	99.0%	0.059	**0.07**	0.19
2437	6	Rear	10	18.92	19.50	99.0%	0.118	**0.14**	0.09
2437	6	Left	10	18.92	19.50	99.0%	0.069	**0.08**	-0.04
2437	6	Top	10	18.92	19.50	99.0%	0.060	**0.07**	0.02
2437	6	Front	15	18.92	19.50	99.0%	0.031	**0.04**	0.06
2437	6	Rear	15	18.92	19.50	99.0%	0.048	**0.06**	0.04

Note1: This max SAR value zoom scan graph is Fig A.33 when the distance is 10mm
Note2: This max SAR value zoom scan graph is Fig A.34 when the distance is 15mm

Table 14.1-26: SAR Values(BT-Head)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
2480	78	GFSK	Cheek Right	0	10.52	11	0.050	**0.06**	-0.10
2480	78	GFSK	Tilt Right	0	10.52	11	0.034	**0.04**	0.05
2480	78	GFSK	Cheek Left	0	10.52	11	0.029	**0.03**	0.05
2480	78	GFSK	Tilt Left	0	10.52	11	0.021	**0.02**	-0.14

Table 14.1-27: SAR Values(BT-Body)

Frequency		Mode (number of timeslots)	Test Position	Distance (mm)	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
2480	78	GFSK	Front	10	10.52	11	0.009	**0.01**	0.03
2480	78	GFSK	Rear	10	10.52	11	0.019	**0.02**	-0.06
2480	78	GFSK	Left	10	10.52	11	0.012	**0.01**	-0.08
2480	78	GFSK	Top	10	10.52	11	0.014	**0.02**	0.07
2480	78	GFSK	Front	15	10.52	11	0.007	**0.01**	0.11
2480	78	GFSK	Rear	15	10.52	11	0.010	**0.01**	0.03

14.2. 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.

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15. Measurement Uncertainty

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

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						9.55	9.43	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						19.1	18.9	

Measurement Uncertainty for Normal SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'}=\sqrt{\sum_{i=1}^{21}c_i^2u_i^2}$						10.7	10.6	257
Expanded uncertainty (confidence interval of 95 %)		$u_e=2u_c$						21.4	21.1	

Measurement Uncertainty for Fast SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom

Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞

Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						10.4	10.3	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						20.8	20.6	

Measurement Uncertainty for Fast SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										

18	Phantomuncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.5	13.4	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						27.0	26.8	

16. MAIN TEST INSTRUMENTS

Table 16-1: List of Main Instruments

No.	Name	Type	Serial Number	Software version	Hardware version	Calibration Date	Valid Period
01	Probe	EX3DV4	7401	--	--	2021-06-07	2022-06-06
02	DAE	DAE4	797	--	--	2022-05-17	2023-05-16
03	Power Meter	N1914A	MY50 001660	--	--	2021-06-12	2022-06-11
04	Radio Communication Analyzer	CMW500	164483	--	--	2022-05-12	2023-05-11
05	Signal Generator	N5181A	MY50 143363	--	--	2021-06-12	2022-06-11
06	Power Sensor	E8481H	MY51 020011	--	--	2021-06-25	2022-06-25
07	Power Amplifier	ZHL	QA120 2003			2022-05-12	2023-05-11
08	Network Analyzer	E5071C	MY46 212462	A.10.0x	8.0	2021-06-12	2022-06-11
09	D750V3	Dipole	1037	--	--	2021-04-17	2023-04-16
10	D835V2	Dipole	4d135	--	--	2020-10-16	2022-10-15
11	D1750V2	Dipole	1063	--	--	2020-10-15	2022-10-14
12	D1900V2	Dipole	5d153	--	--	2020-10-14	2022-10-13
13	D2450V2	Dipole	886	--	--	2020-10-13	2022-10-12

ANNEX A. GRAPH RESULTS

GSM 850 Cheek Left

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.908 S/m; εr = 41.99; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System:Generic GSM(850); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)

Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.210 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.367 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.209 W/kg; SAR(10 g) = 0.192 W/kg
Maximum value of SAR (measured) = 0.211 W/kg

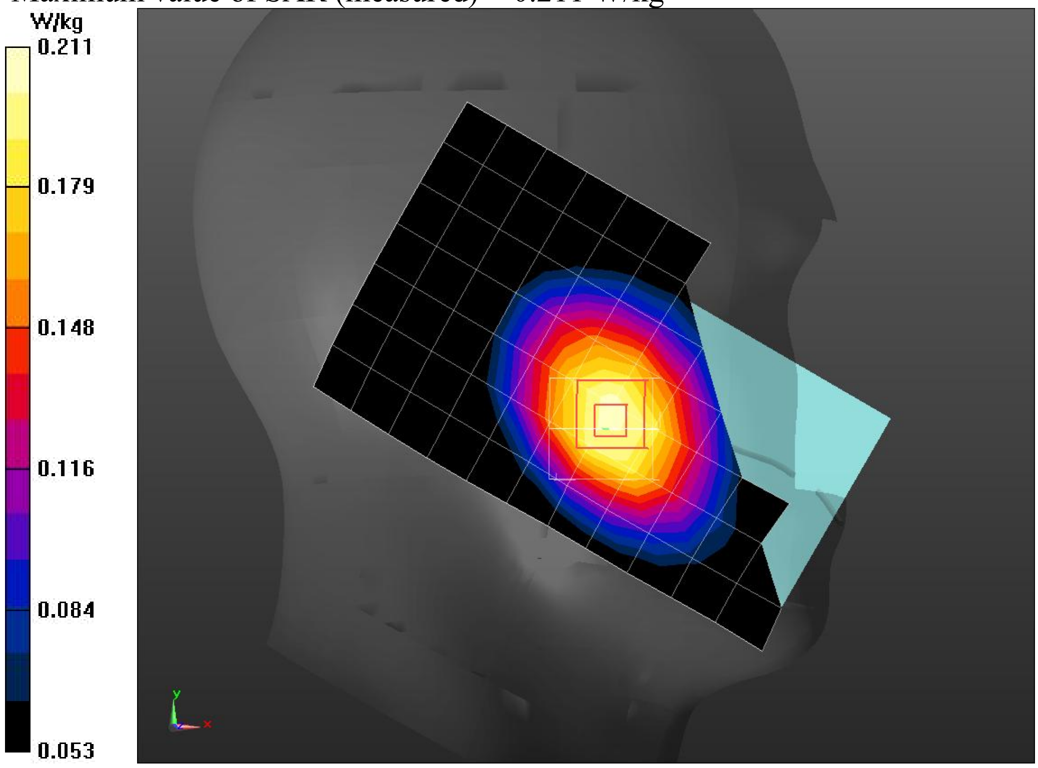

Fig A.1

GSM850 Body Rear 10mm_Hotspot

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Head 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.883 S/m; εr = 41.836; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System:Generic GSM (0); Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.555 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.40 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.645 W/kg; SAR(10 g) = 0.382 W/kg
Maximum value of SAR (measured) = 0.710 W/kg

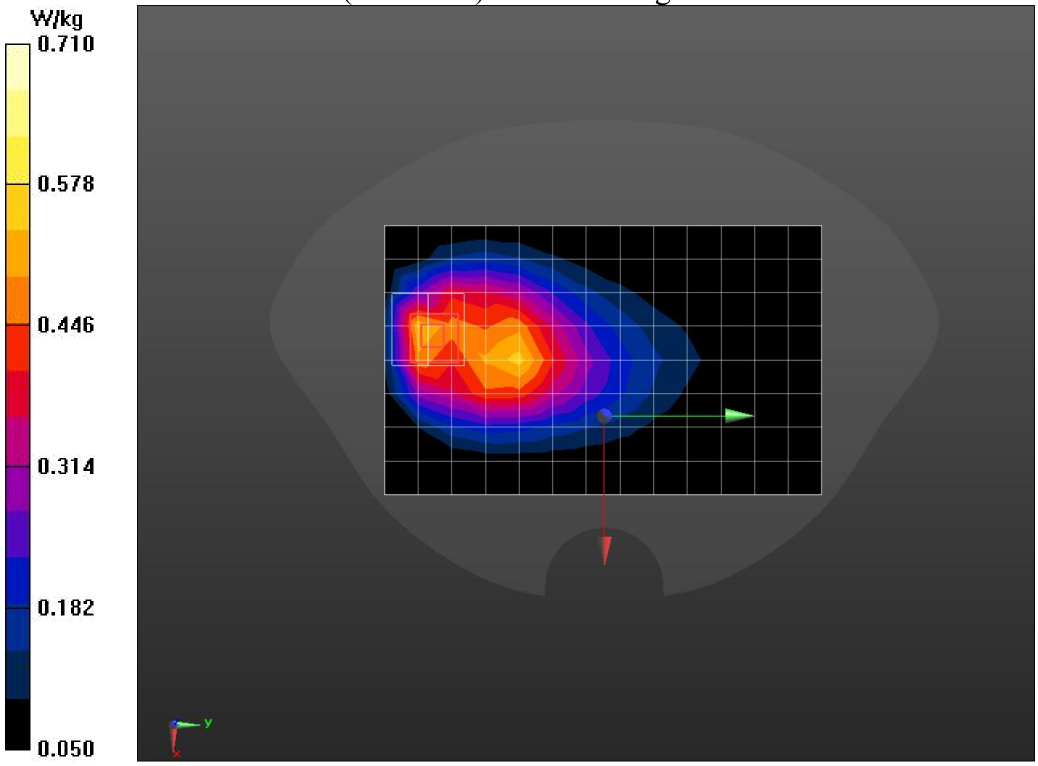

Fig A.2

GSM1900 Cheek Right

Date/Time: 2022/5/24
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.379 S/m; εr = 39.465; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: E/GPRS1900 (0); Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.123 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.555 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.192 W/kg
SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.074 W/kg
Maximum value of SAR (measured) = 0.125 W/kg

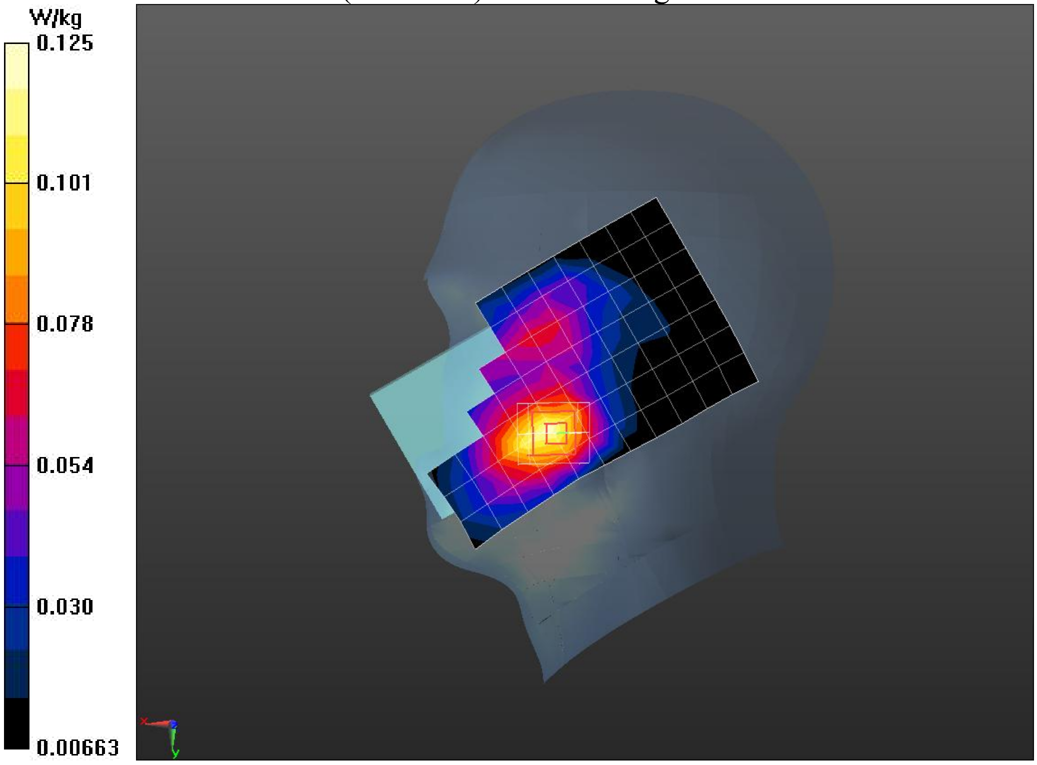

Fig A.3

GSM1900 Body Rear 10mm Hotspot

Date/Time: 2022/5/24
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.406 S/m; εr = 39.288; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: E/GPRS1900 (0); Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)

Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.363 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.101 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.734 W/kg
SAR(1 g) = 0.363 W/kg; SAR(10 g) = 0.199 W/kg
Maximum value of SAR (measured) = 0.408 W/kg

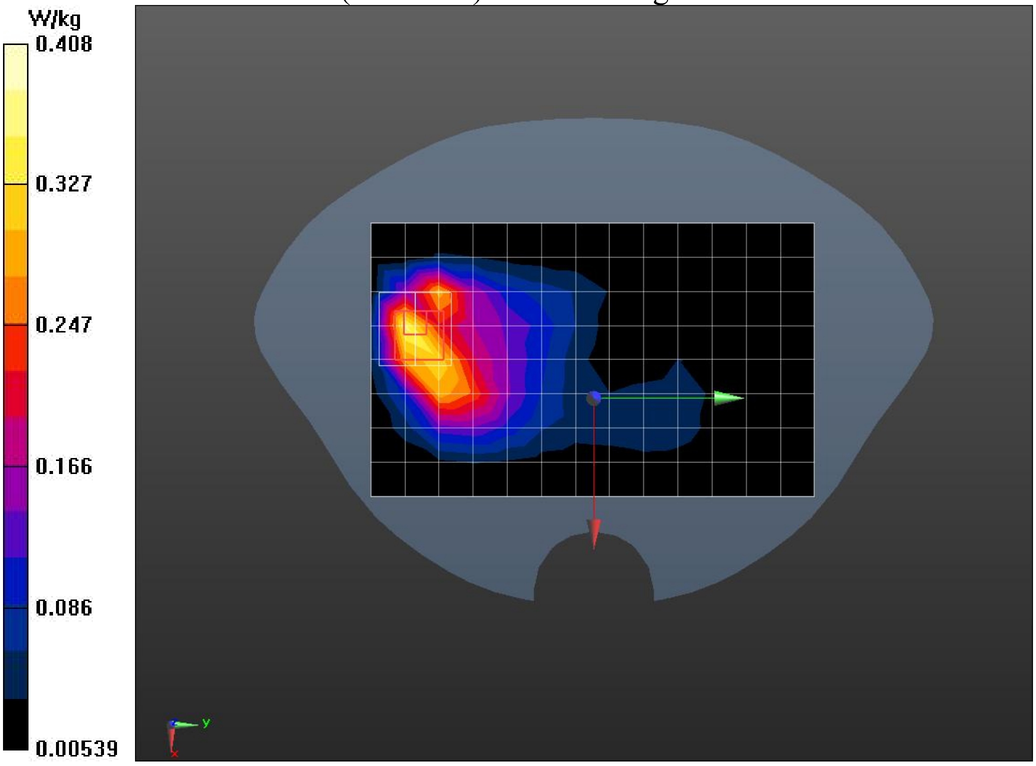

Fig A.4

GSM1900 Body Rear 15mm

Date/Time: 2022/5/24
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.379 S/m; εr = 39.465; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: E/GPRS1900 (0); Frequency: 1850.2 MHz; Duty Cycle: 1:2
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.217 W/kg
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.282 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.350 W/kg
SAR(1 g) = 0.204 W/kg; SAR(10 g) = 0.123 W/kg
Maximum value of SAR (measured) = 0.229 W/kg

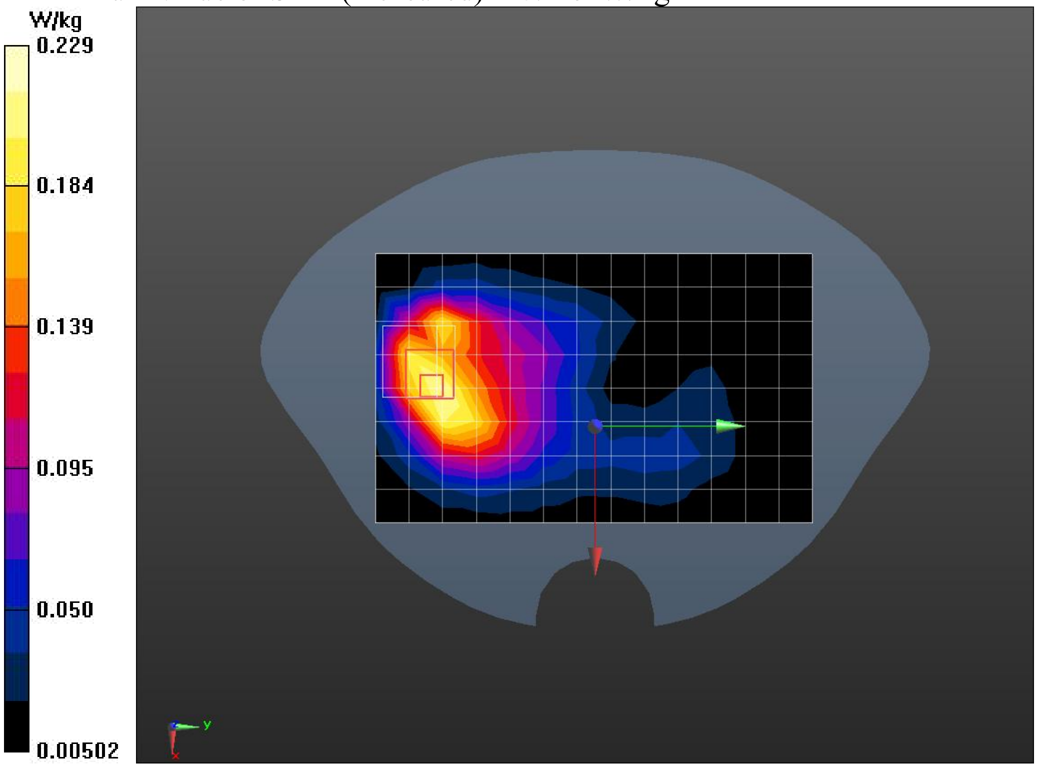

Fig A.5

WCDMA1900 Cheek Right

Date/Time: 2022/5/23
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.406 S/m; εr = 39.288; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.439 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.666 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.722 W/kg
SAR(1 g) = 0.423 W/kg; SAR(10 g) = 0.250 W/kg
Maximum value of SAR (measured) = 0.460 W/kg

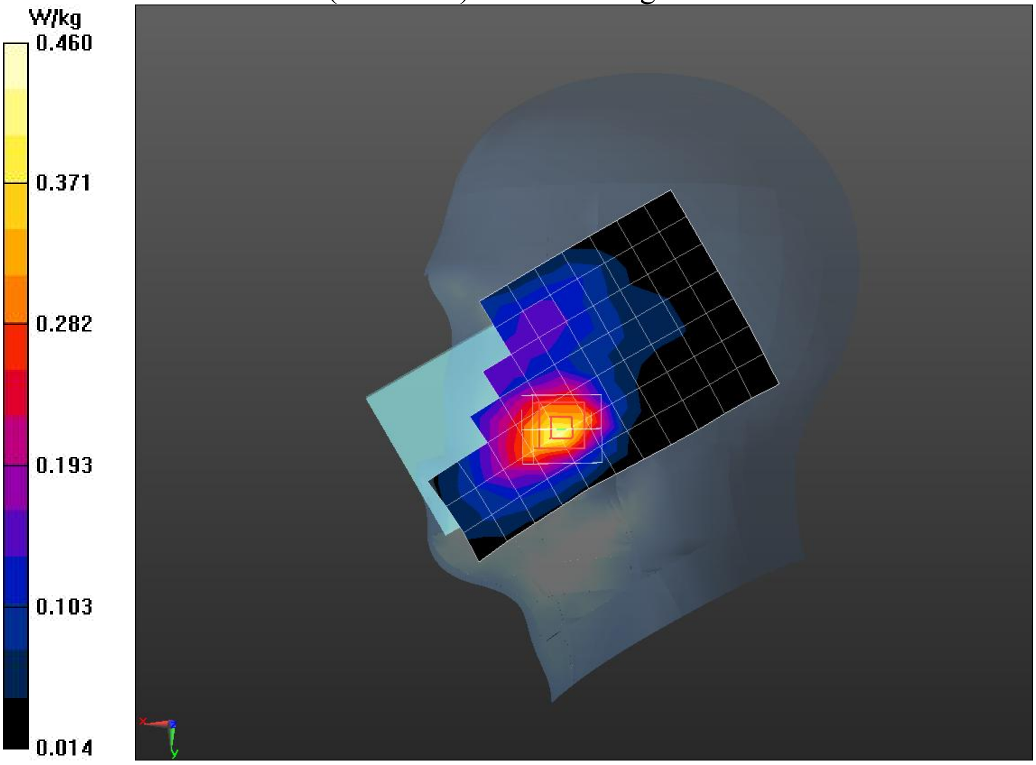

Fig A.6

WCDMA 1900 Body Rear 10mm Hotspot

Date/Time: 2022/5/23
Electronics: DAE4 Sn797
Medium: Head1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.406 S/m; εr = 39.288; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)

Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.445 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.52 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.802 W/kg
SAR(1 g) = 0.429 W/kg; SAR(10 g) = 0.241 W/kg
Maximum value of SAR (measured) = 0.470 W/kg

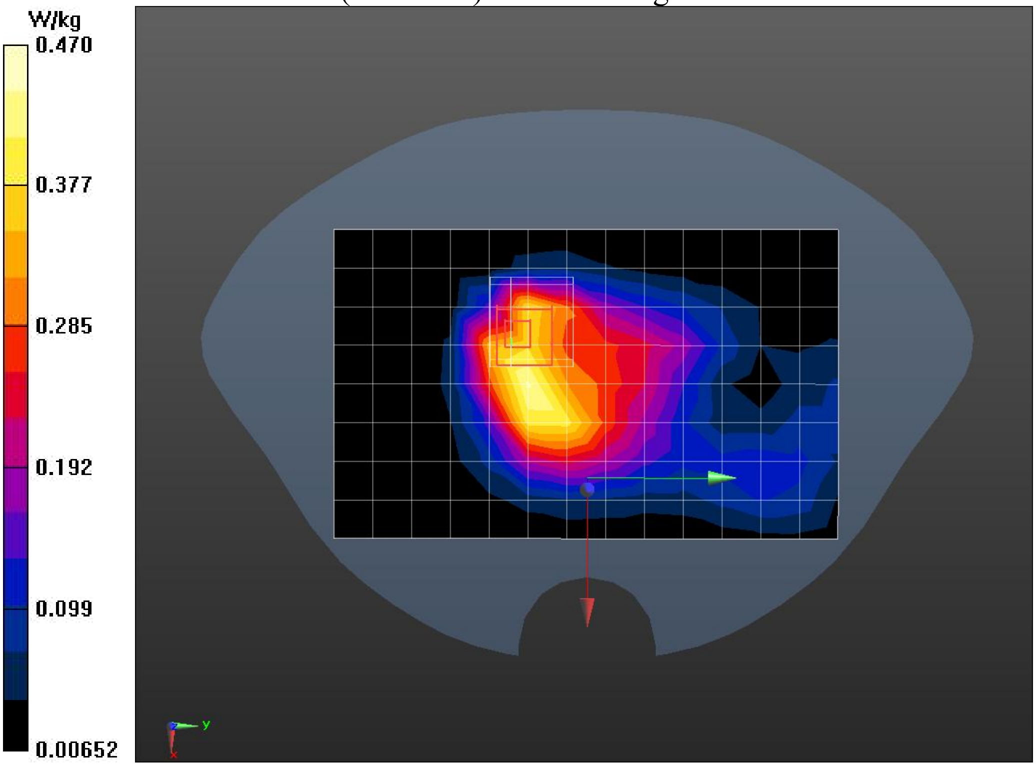

Fig A.7

WCDMA1900 Body Rear 15mm

Date/Time: 2022/5/24
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.406 S/m; εr = 39.288; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.367 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.848 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.221 W/kg
Maximum value of SAR (measured) = 0.382 W/kg

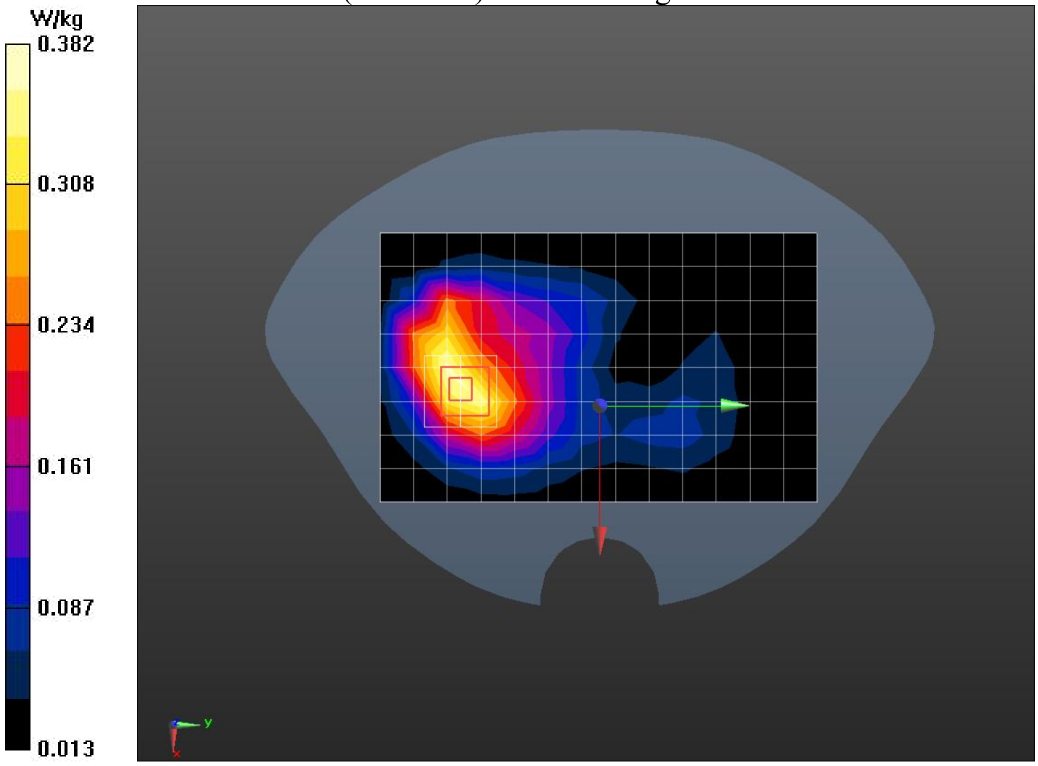

Fig A.8

WCDMA1700 Cheek Right

Date/Time: 2022/5/25
Electronics: DAE4 Sn797
Medium: Head 1750MHz
Medium parameters used: f = 1753 MHz; σ = 1.365 S/m; εr = 41.126; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 1752.6 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)

Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.327 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.623 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.521 W/kg
SAR(1 g) = 0.315 W/kg; SAR(10 g) = 0.197 W/kg
Maximum value of SAR (measured) = 0.341 W/kg

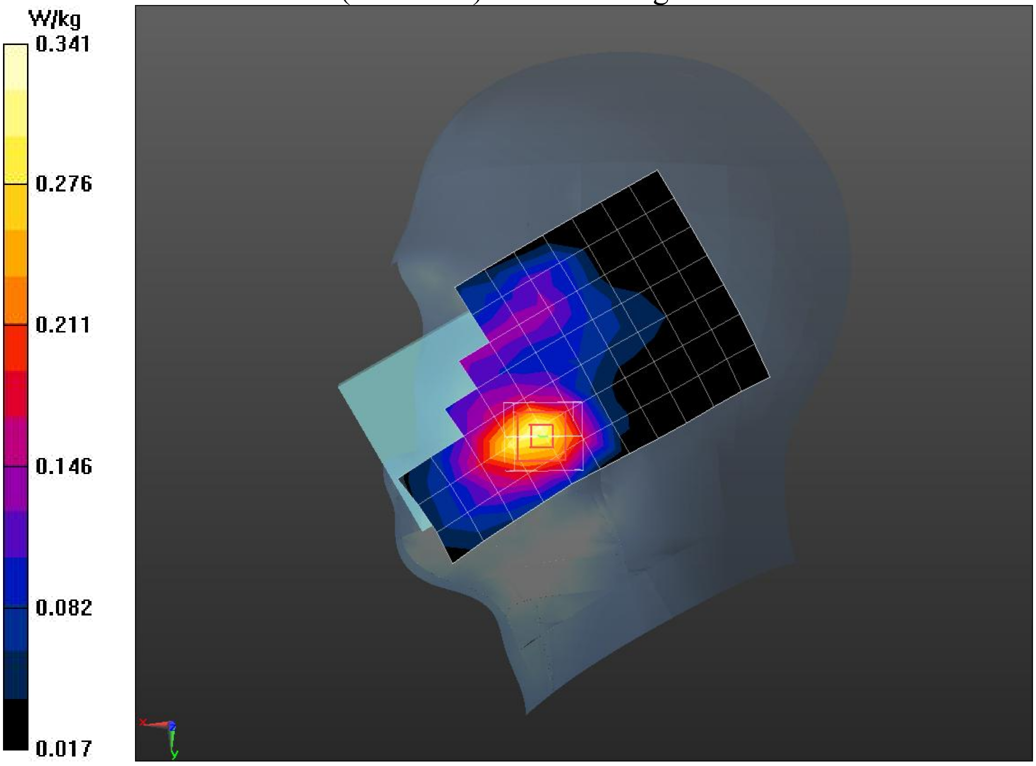

Fig A.9

WCDMA1700 Body Rear 10mm Hotspot

Date/Time: 2022/5/25
Electronics: DAE4 Sn797
Medium: Dipole 1750MHz
Medium parameters used: f = 1753 MHz; σ = 1.365 S/m; εr = 41.126; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 1752.6 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.589 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.45 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.867 W/kg
SAR(1 g) = 0.487 W/kg; SAR(10 g) = 0.280 W/kg
Maximum value of SAR (measured) = 0.535 W/kg

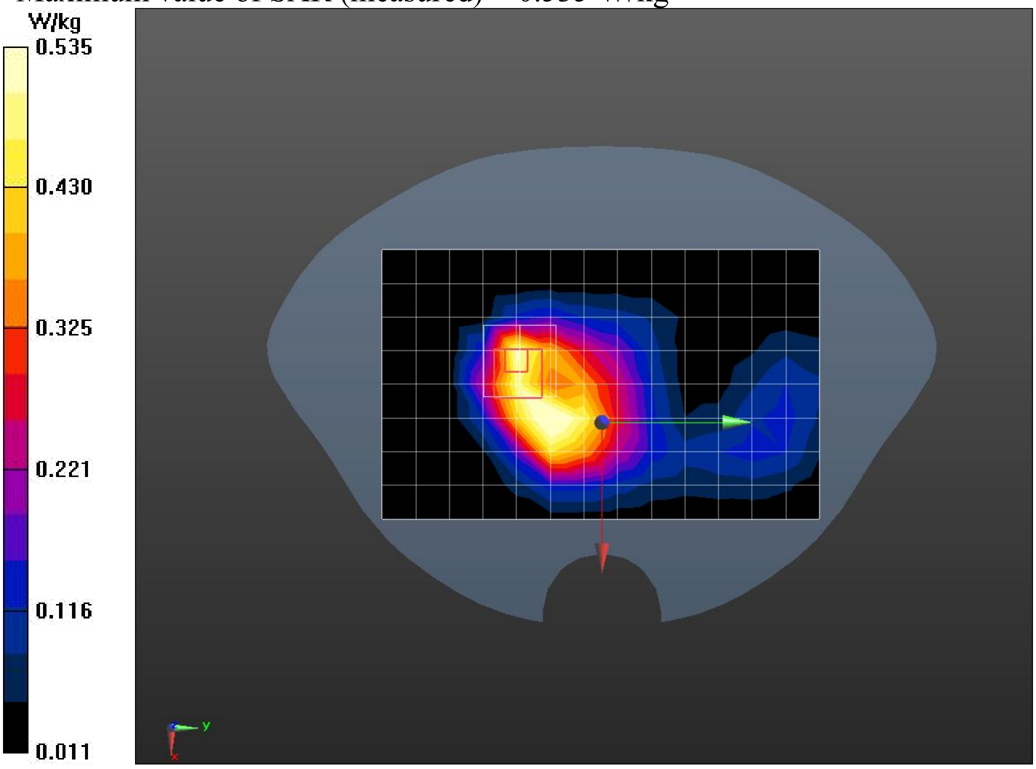

Fig A.10

WCDMA 1700 Body Rear 15mm

Date/Time: 2022/5/25
Electronics: DAE4 Sn797
Medium: Head 1750MHz
Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.331 S/m; εr = 41.099; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 1732.4 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.424 W/kg
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.33 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.592 W/kg
SAR(1 g) = 0.405 W/kg; SAR(10 g) = 0.264 W/kg
Maximum value of SAR (measured) = 0.435 W/kg

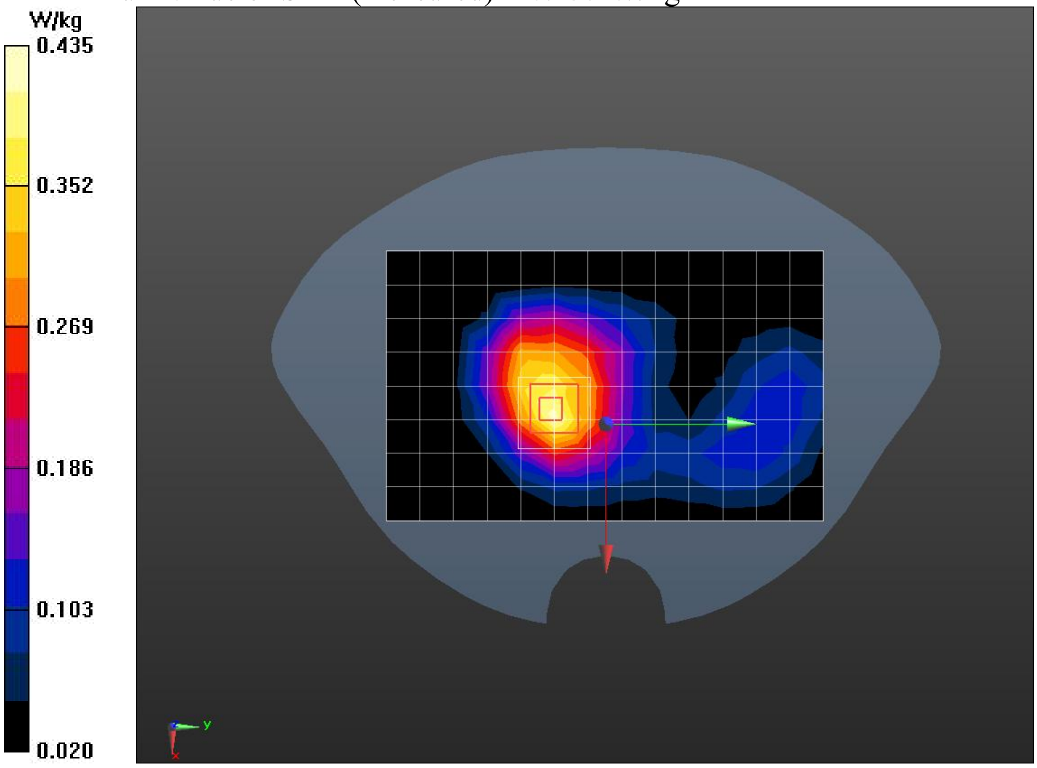

Fig A.11

WCDMA850 Cheek Left

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Head 835MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.887 S/m; εr = 41.861; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: WCDMA Band5; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)
Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.767 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.10 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.751 W/kg; SAR(10 g) = 0.518 W/kg
Maximum value of SAR (measured) = 0.825 W/kg

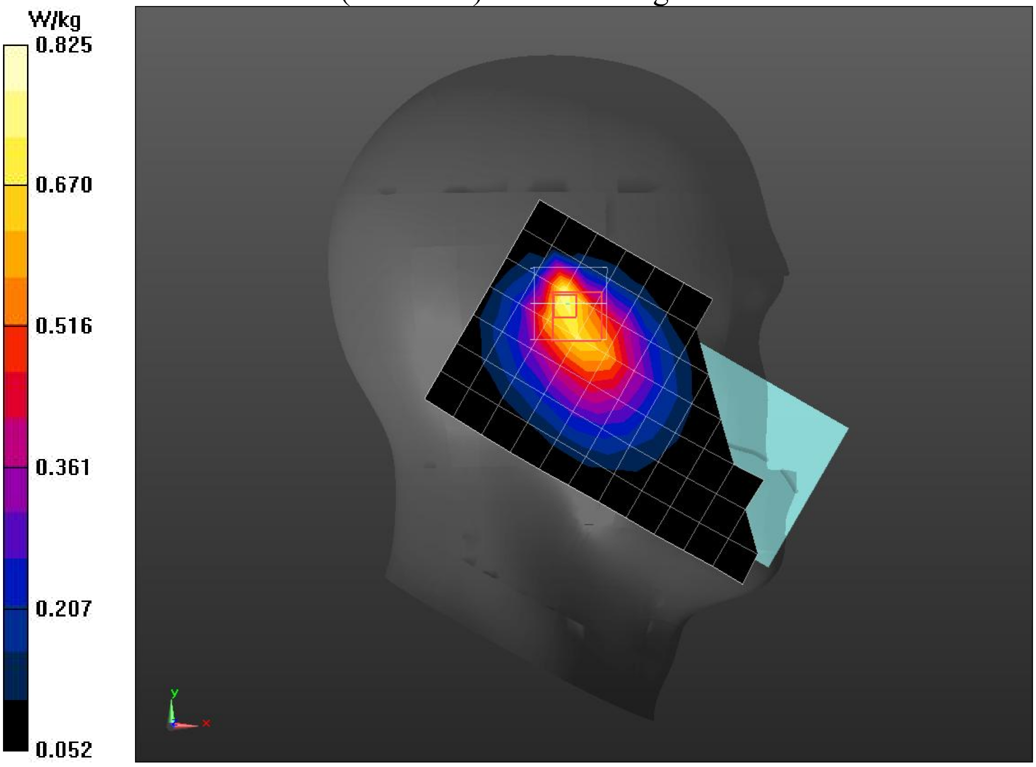

Fig A.12

WCDMA850 Body Right 10mm

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.908 S/m; εr = 41.99; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: WCDMA (0); Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)
Area Scan (4x13x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.708 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.69 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.882 W/kg
SAR(1 g) = 0.722 W/kg; SAR(10 g) = 0.572 W/kg
Maximum value of SAR (measured) = 0.753 W/kg

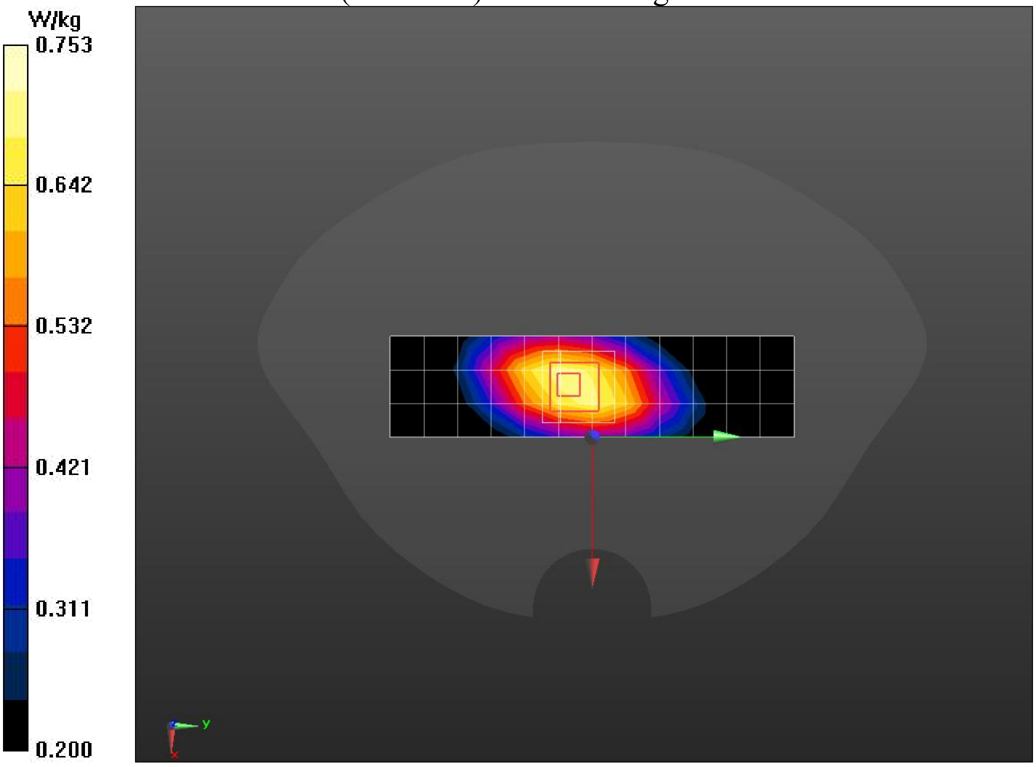

Fig A.13

LTE Band2 Cheek Left

Date/Time: 2022/5/23
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.426 S/m; εr = 39.218; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: LTE Band 2 (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)

Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.408 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.619 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.556 W/kg
SAR(1 g) = 0.379 W/kg; SAR(10 g) = 0.243 W/kg
Maximum value of SAR (measured) = 0.398 W/kg

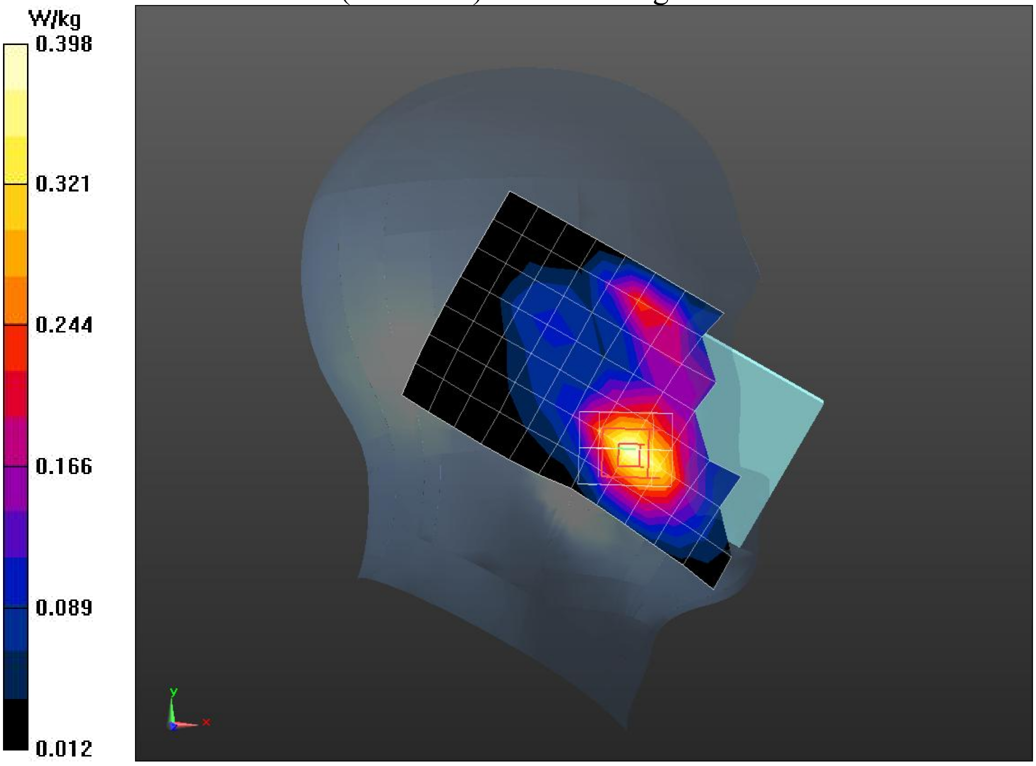

Fig A.14

LTE Band2 Body Rear 10mm Hotspot

Date/Time: 2022/5/23
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.426 S/m; εr = 39.218; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: LTE Band 2 (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.659 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.99 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.667 W/kg; SAR(10 g) = 0.378 W/kg
Maximum value of SAR (measured) = 0.737 W/kg

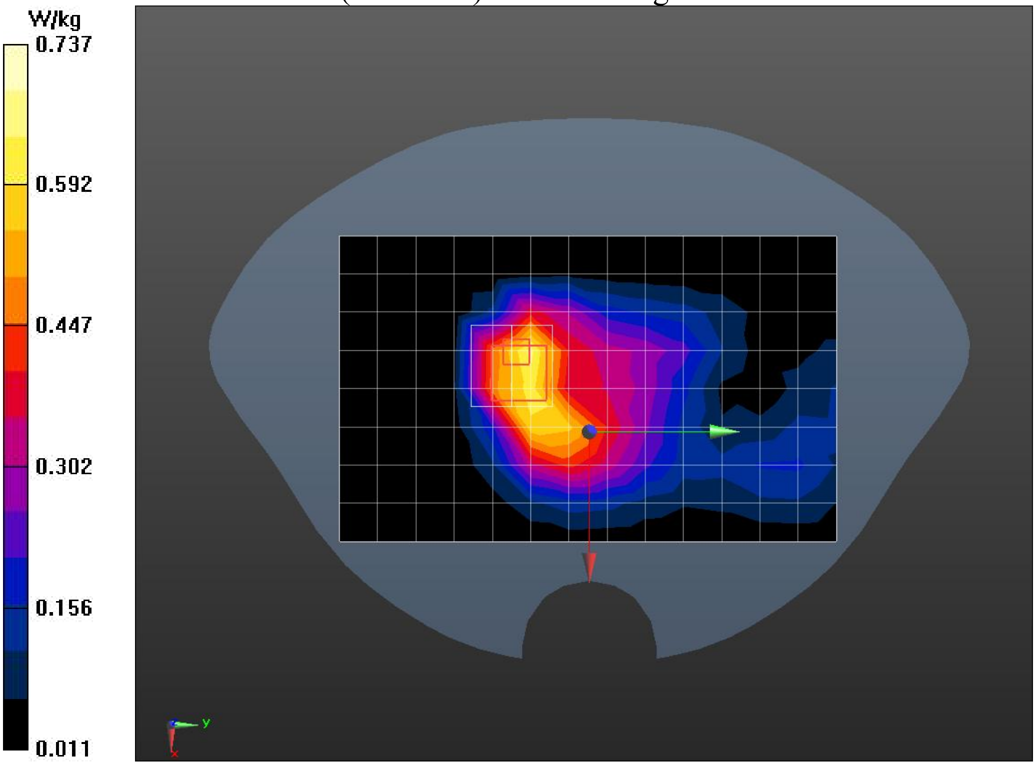

Fig A.15

LTE Band2 Body Rear 15mm

Date/Time: 2022/5/23
Electronics: DAE4 Sn797
Medium: Head 1900MHz
Medium parameters used (extrapolated): f = 1860 MHz; σ = 1.382 S/m; εr = 40.357; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: LTE Band 2 (0); Frequency: 1860 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.367 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.55 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.521 W/kg
SAR(1 g) = 0.349 W/kg; SAR(10 g) = 0.226 W/kg
Maximum value of SAR (measured) = 0.375 W/kg

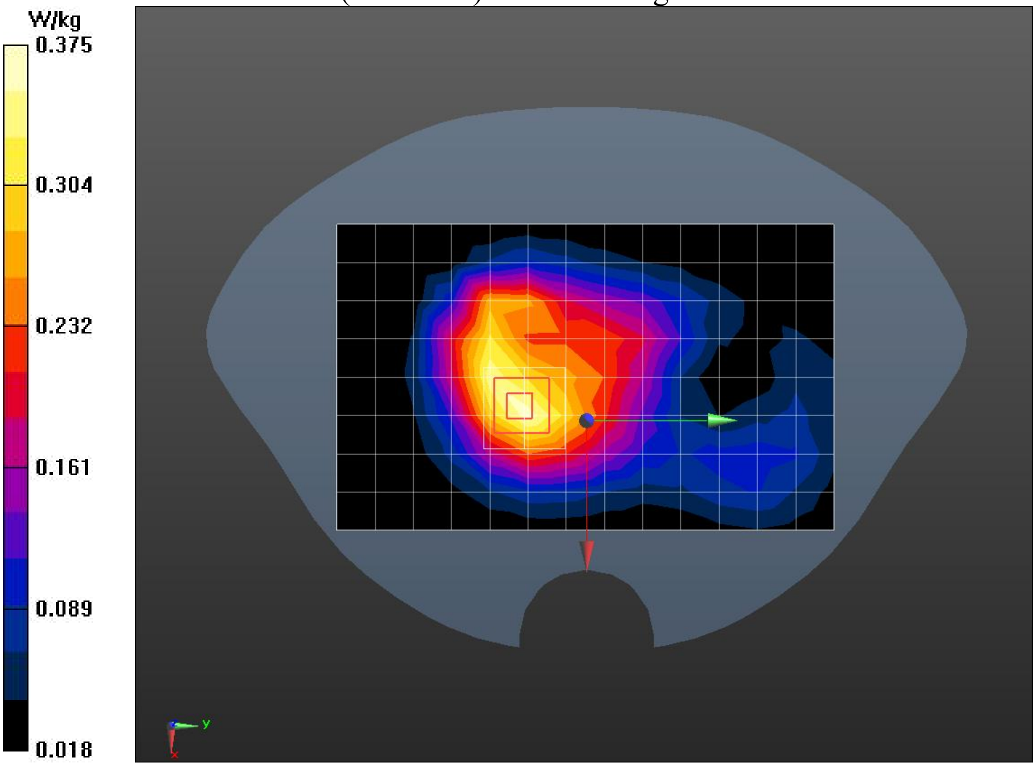

Fig A.16

LTE Band5 Cheek Left

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.907 S/m; εr = 41.982; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)
Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.850 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.27 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.767 W/kg; SAR(10 g) = 0.549 W/kg
Maximum value of SAR (measured) = 0.821 W/kg

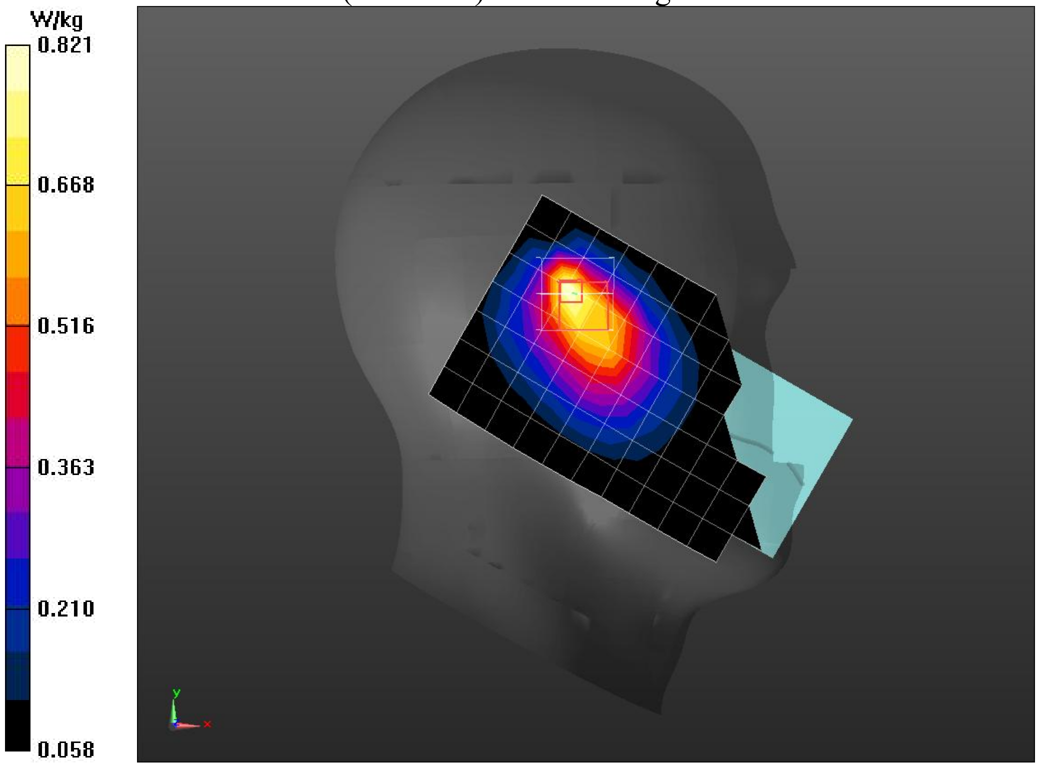

Fig A.17

LTE Band5 Body Right 10mm Hotspot

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Head 835MHz
Medium parameters used: f = 844 MHz; σ = 0.922 S/m; εr = 42.072; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: LTE Band 5 (0); Frequency: 844 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)

Area Scan (4x13x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.755 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.06 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.925 W/kg
SAR(1 g) = 0.754 W/kg; SAR(10 g) = 0.598 W/kg
Maximum value of SAR (measured) = 0.788 W/kg

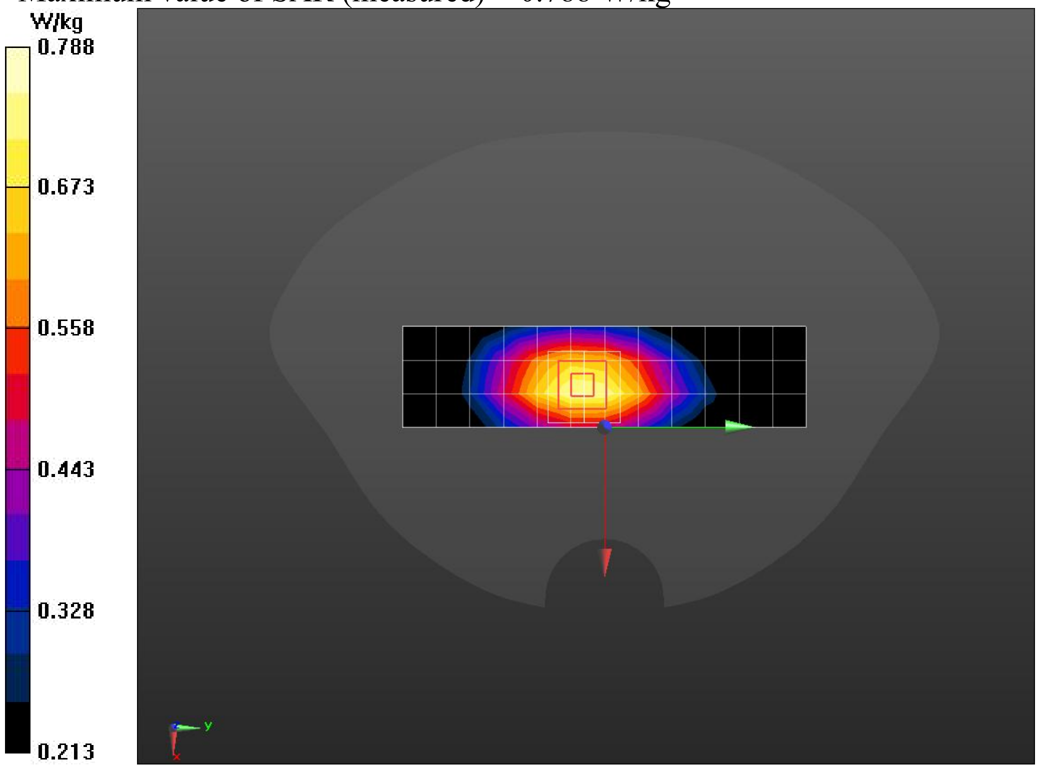

Fig A.18

LTE Band12 Cheek Left

Date/Time: 2022/5/30
Electronics: DAE4 Sn797
Medium: Head 750MHz
Medium parameters used: f = 704 MHz; σ = 0.876 S/m; εr = 43.221; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: LTE Band 12 (0); Frequency: 704 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.59, 10.59, 10.59)

Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.459 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.09 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.683 W/kg
SAR(1 g) = 0.456 W/kg; SAR(10 g) = 0.365 W/kg
Maximum value of SAR (measured) = 0.495 W/kg

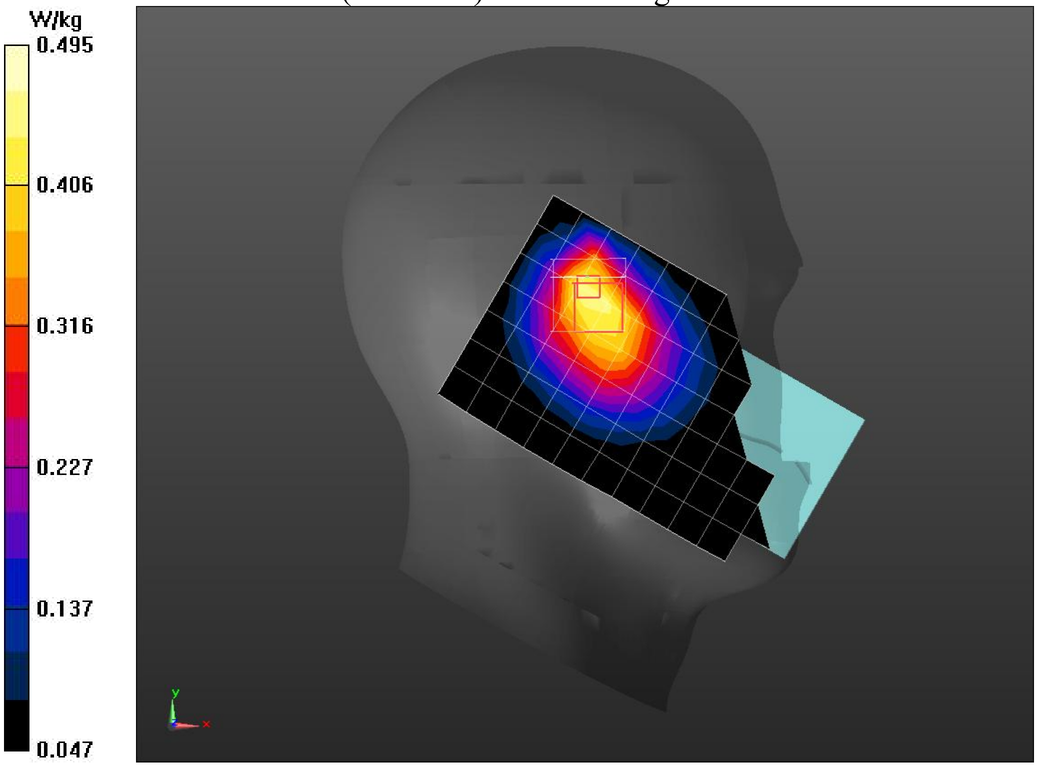

Fig A.19

LTE Band 12 Body Rear 10mm Hotspot

Date/Time: 2022/5/30
Electronics: DAE4 Sn797
Medium: Head 750MHz
Medium parameters used: f = 704 MHz; σ = 0.876 S/m; εr = 43.221; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: LTE Band 12 (0); Frequency: 704 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.59, 10.59, 10.59)

Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.512 W/kg

Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.88 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.561 W/kg
SAR(1 g) = 0.505 W/kg; SAR(10 g) = 0.434 W/kg
Maximum value of SAR (measured) = 0.519 W/kg

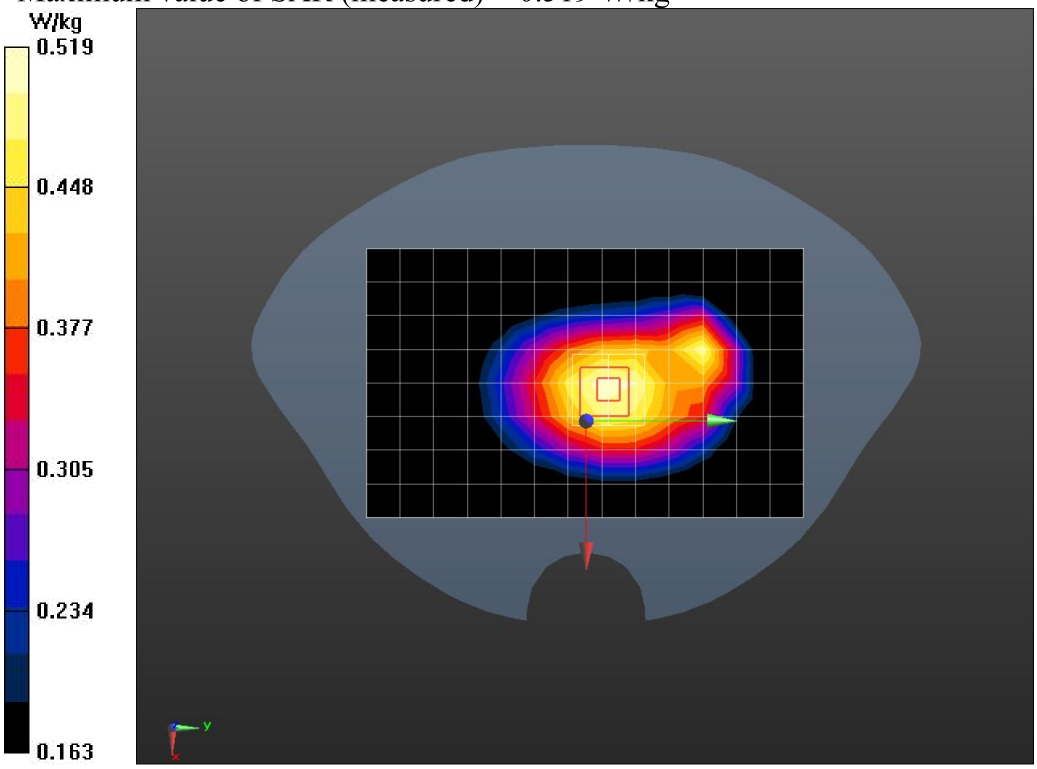

Fig A.20

LTE Band66 Cheek Right

Date/Time: 2022/5/26
Electronics: DAE4 Sn797
Medium: Head 1750MHz
Medium parameters used: f = 1720 MHz; σ = 1.325 S/m; εr = 41.269; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: LTE Band 66 (0); Frequency: 1720 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
Area Scan (8x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.309 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.572 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.509 W/kg
SAR(1 g) = 0.302 W/kg; SAR(10 g) = 0.191 W/kg
Maximum value of SAR (measured) = 0.324 W/kg

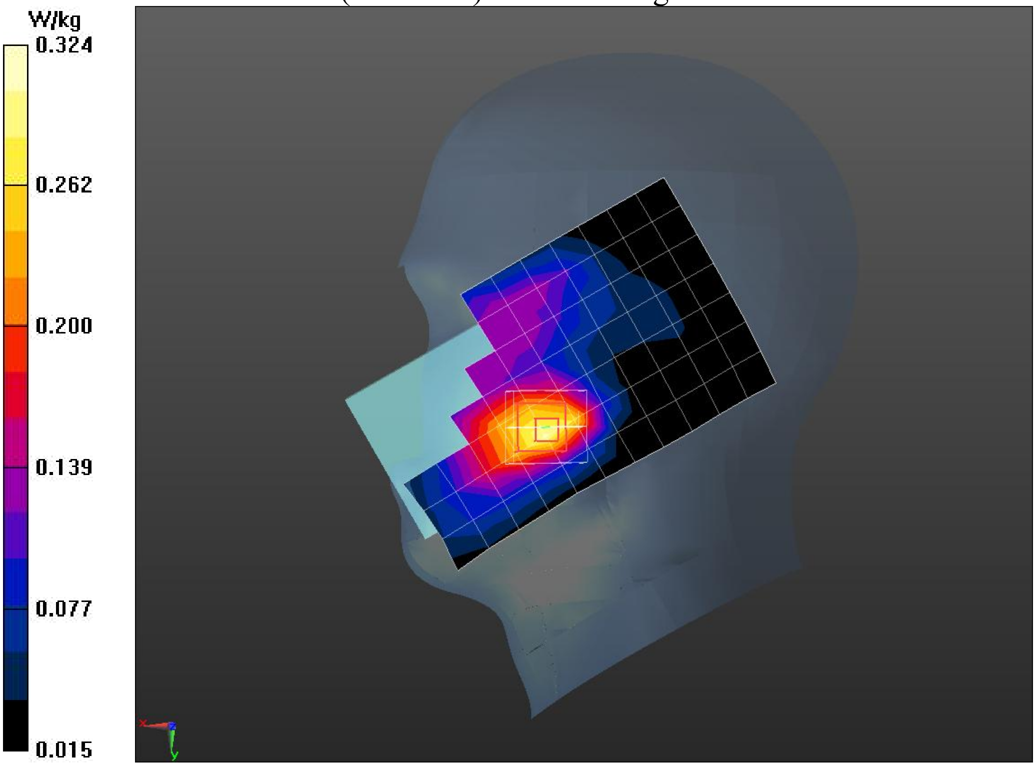

Fig A.26

LTE Band66 Body Rear 10mm Hotspot

Date/Time: 2022/5/26
Electronics: DAE4 Sn797
Medium: Head 1750MHz
Medium parameters used: f = 1720 MHz; σ = 1.325 S/m; εr = 41.269; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: LTE Band 66; Frequency: 1720 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.574 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.75 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.831 W/kg
SAR(1 g) = 0.472 W/kg; SAR(10 g) = 0.278 W/kg
Maximum value of SAR (measured) = 0.519 W/kg

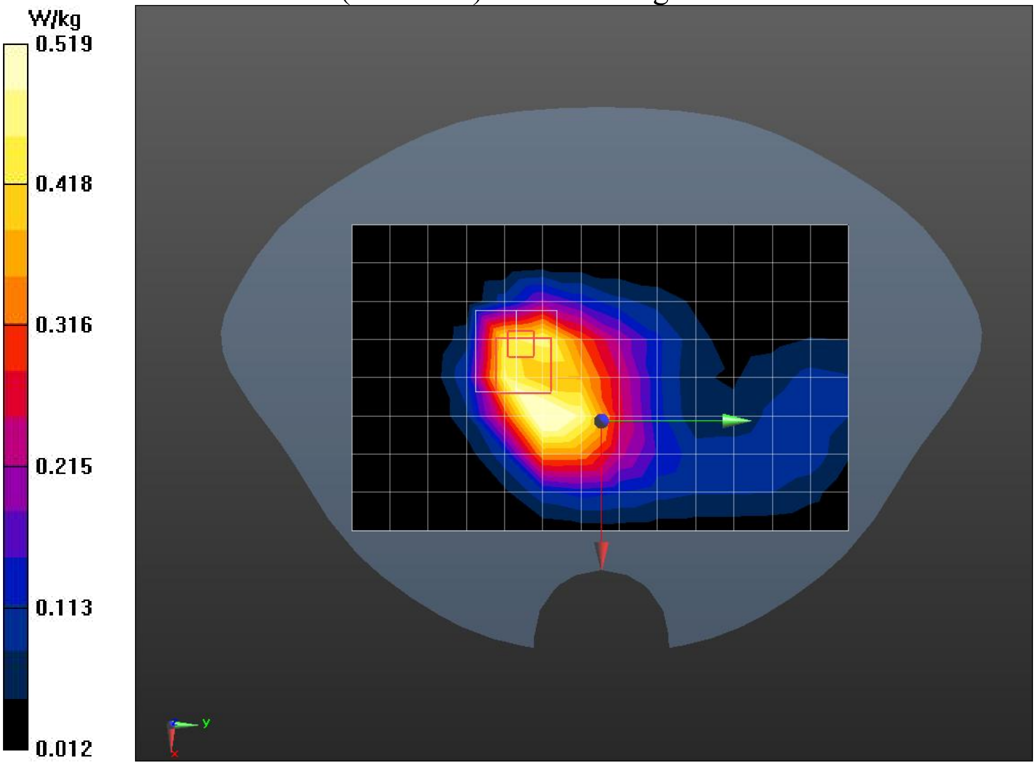

Fig A.27

LTE Band66 Body Rear 15mm

Date/Time: 2022/5/26
Electronics: DAE4 Sn797
Medium: Head 1750MHz
Medium parameters used: f = 1720 MHz; σ = 1.325 S/m; εr = 41.269; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: LTE Band 66 ; Frequency: 1720 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
Area Scan (9x14x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.287 W/kg
Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.60 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.427 W/kg
SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.197 W/kg
Maximum value of SAR (measured) = 0.321 W/kg

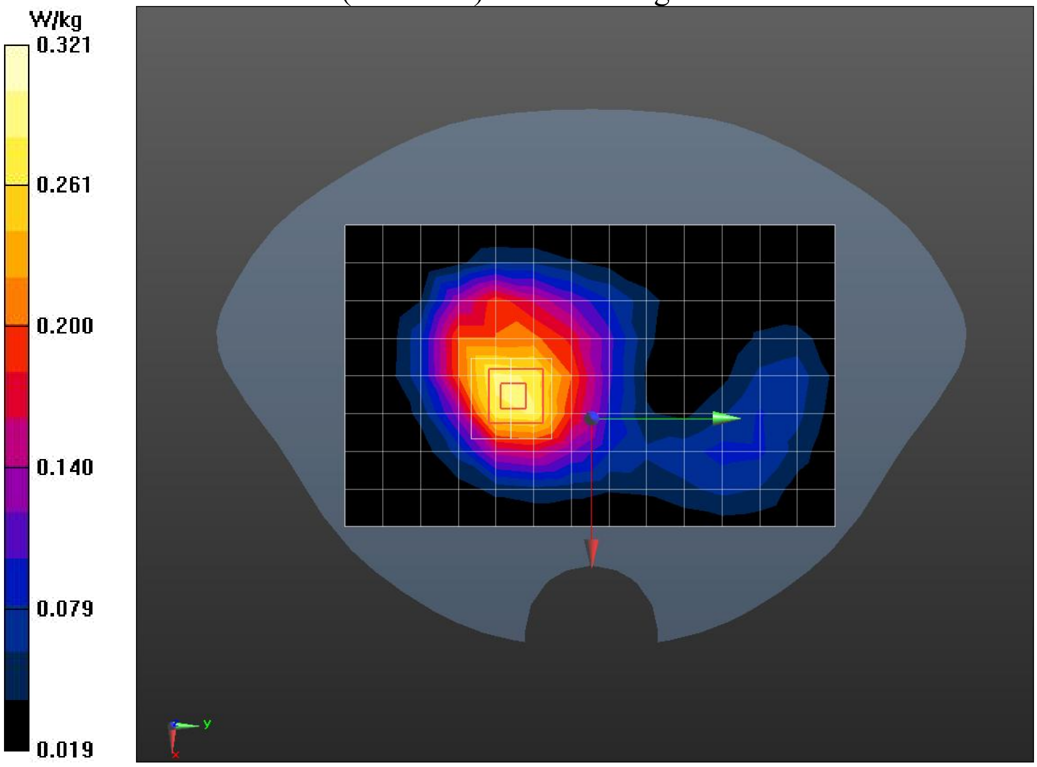

Fig A.28

Bluetooth2.4G Cheek Right

Date/Time: 2022/5/27
Electronics: DAE4 SN797
Medium: Head 2450MHz
Medium parameters used: f = 2480 MHz; σ = 1.894 S/m; εr = 38.776; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: Bluetooth 2.4G (0); Frequency: 2480 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(7.9, 7.9, 7.9)
Area Scan (8x14x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0456 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.662 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.147 W/kg
SAR(1 g) = 0.050 W/kg; SAR(10 g) = 0.022 W/kg
Maximum value of SAR (measured) = 0.0531 W/kg

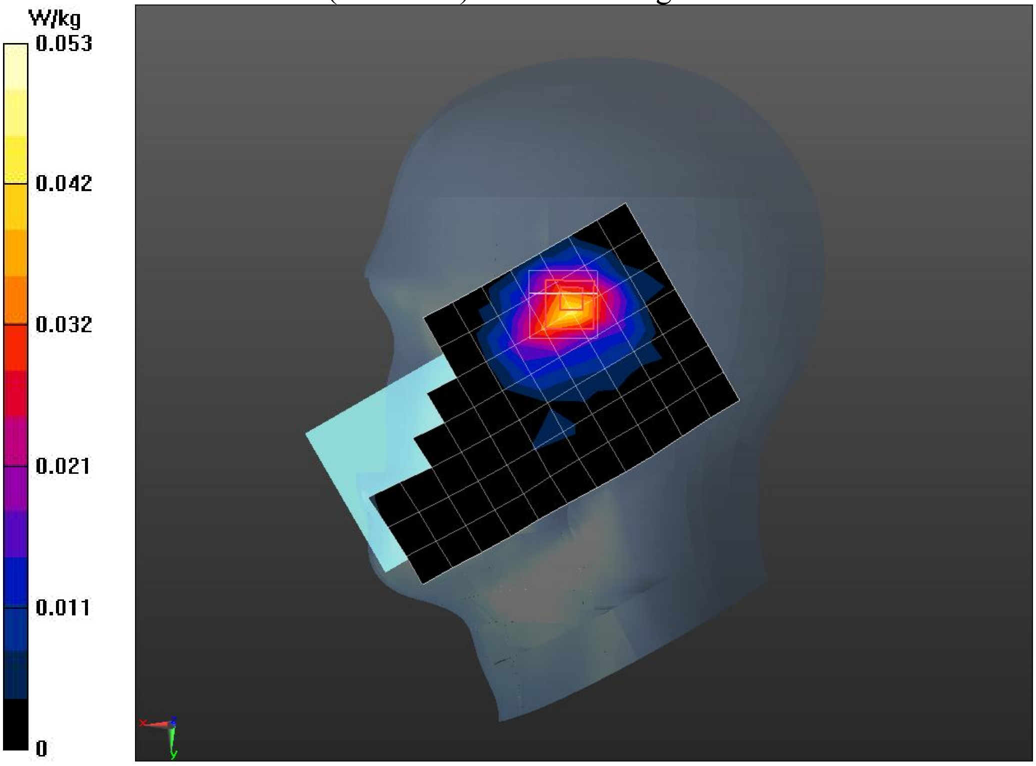

Fig A.29

Bluetooth2.4G Body Rear 10mm
Date/Time: 2022/5/27
Electronics: DAE4 SN797
Medium: Head 2450MHz
Medium parameters used: f = 2480 MHz; σ = 1.894 S/m; εr = 38.776; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: Bluetooth 2.4G (0); Frequency: 2480 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(7.9, 7.9, 7.9)
Area Scan (8x13x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0164 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.369 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.0600 W/kg
SAR(1 g) = 0.019 W/kg; SAR(10 g) = 0.0086 W/kg
Maximum value of SAR (measured) = 0.0199 W/kg

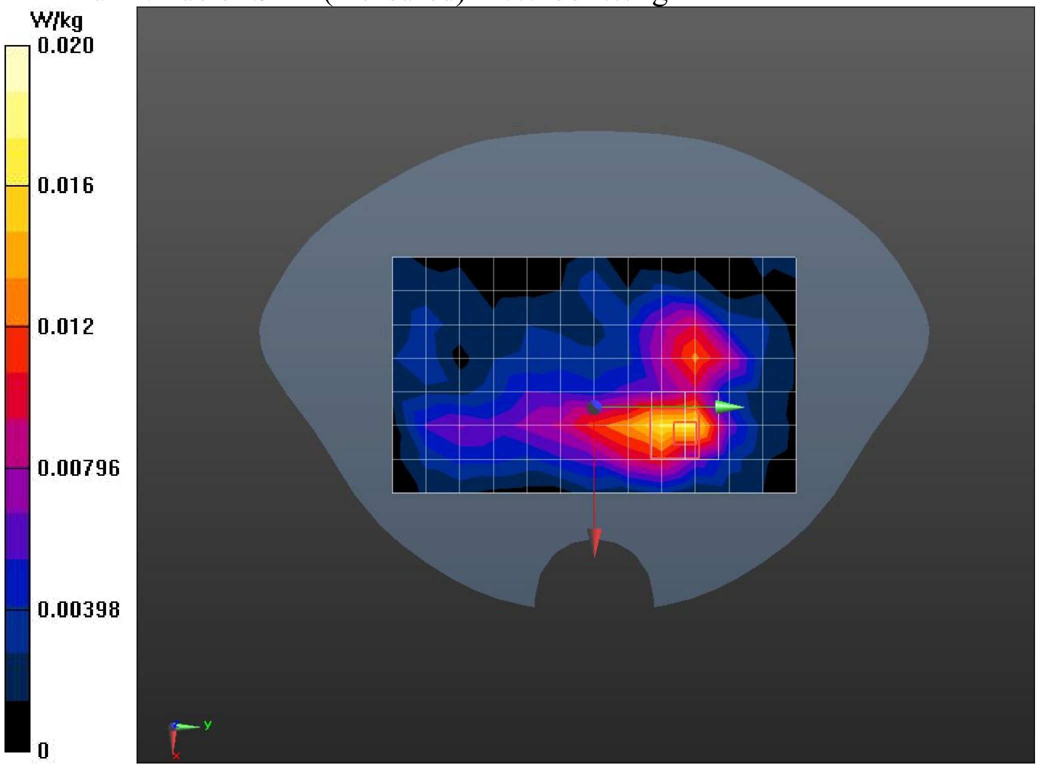

Fig A.30

Bluetooth2.4G Body Rear 15mm

Date/Time: 2022/5/27
Electronics: DAE4 SN797
Medium:Head 2450MHz
Medium parameters used: f = 2480 MHz; σ = 1.894 S/m; εr = 38.776; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: Bluetooth 2.4G (0); Frequency: 2480 MHz; Duty Cycle: 1:1
Probe: EX3DV4 -SN7401ConvF(7.9, 7.9, 7.9)
Area Scan (8x13x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.00993 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.9050 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0280 W/kg
SAR(1 g) = 0.010 W/kg; SAR(10 g) = 0.00514 W/kg
Maximum value of SAR (measured) = 0.0120 W/kg

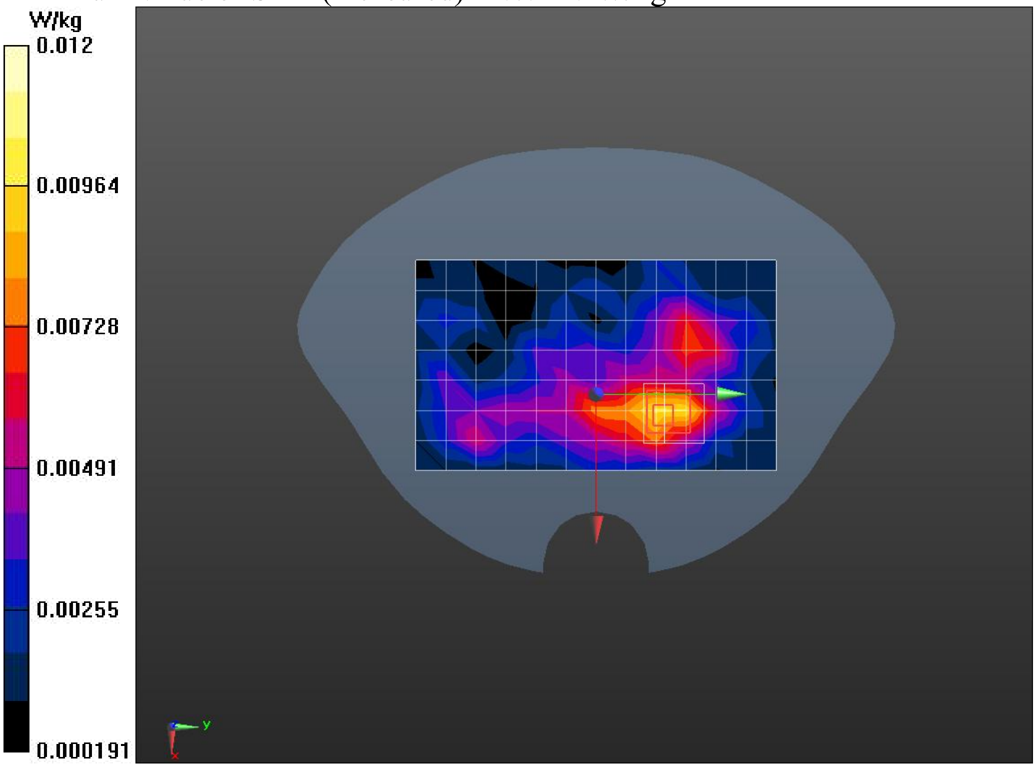

Fig A.31

WiFi 2.4G Cheek Right

Date/Time: 2022/5/27
Electronics: DAE4 SN797
Medium: Head 2450MHz
Medium parameters used: f = 2437 MHz; σ = 1.847 S/m; εr = 38.943; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: Wi-Fi 2.4G (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(7.9, 7.9, 7.9)
Area Scan (8x14x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.225 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.277 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.665 W/kg
SAR(1 g) = 0.261 W/kg; SAR(10 g) = 0.116 W/kg
Maximum value of SAR (measured) = 0.282 W/kg

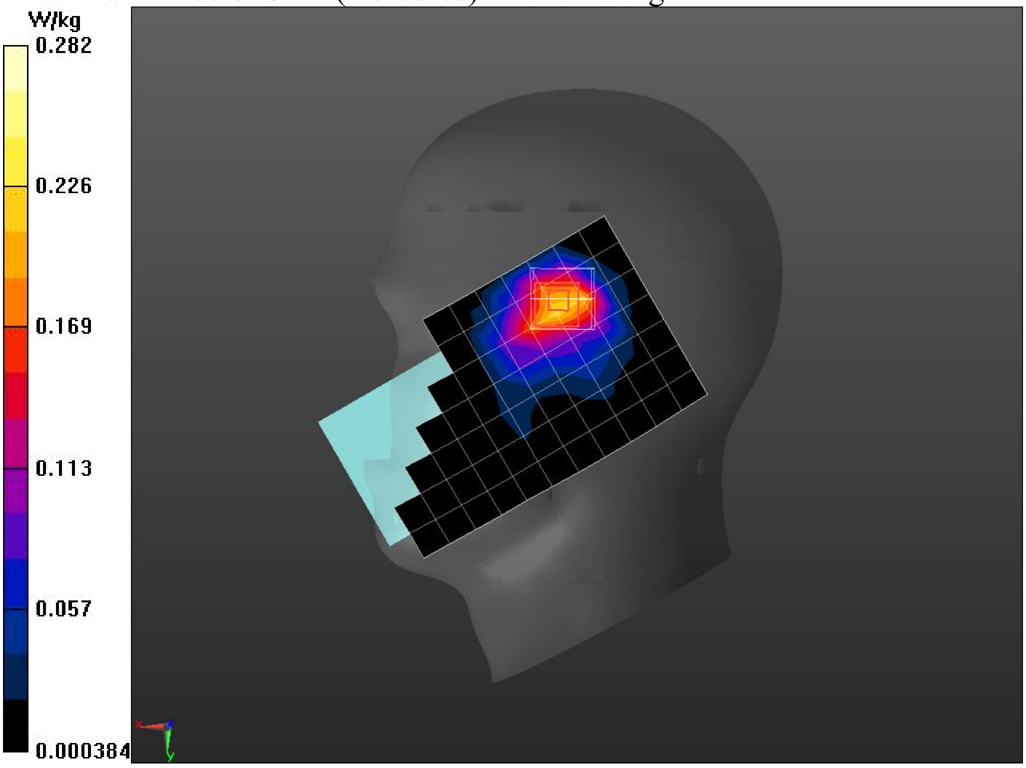

Fig A.32

WiFi 2.4G Body Rear 10mm

Date/Time: 2022/5/27
Electronics: DAE4 SN797
Medium: Head 2450MHz
Medium parameters used: f = 2437 MHz; σ = 1.847 S/m; εr = 38.943; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: Wi-Fi 2.4G (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(7.9, 7.9, 7.9)
Area Scan (9x14x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.104 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.021 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.053 W/kg
Maximum value of SAR (measured) = 0.128 W/kg

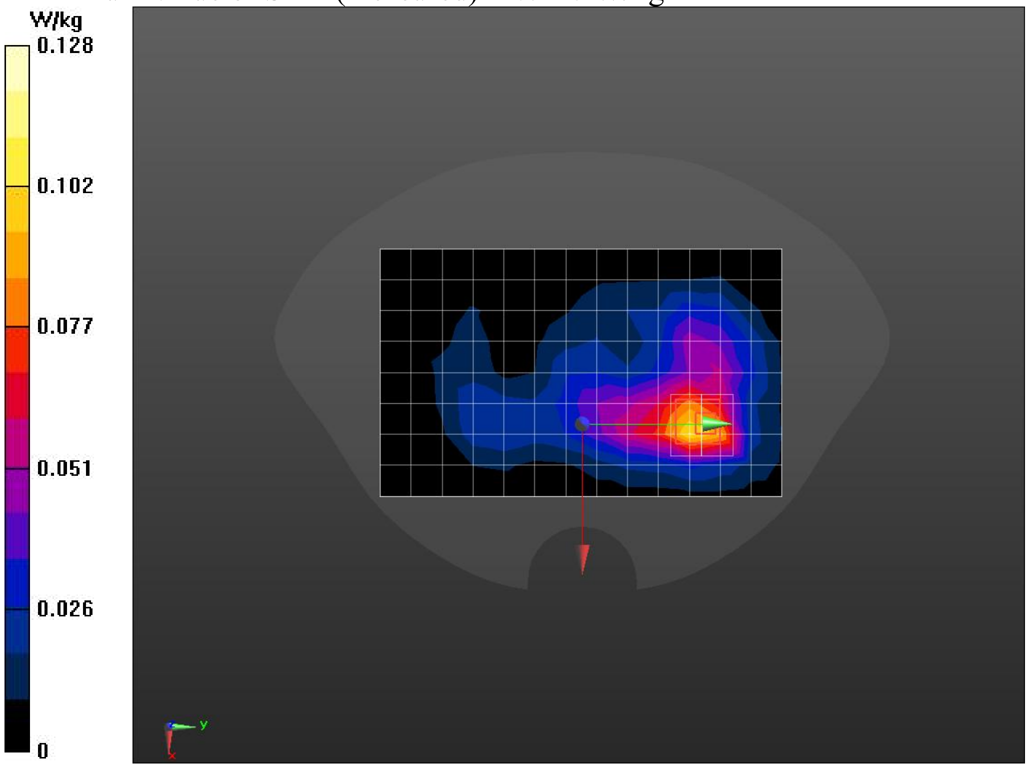

Fig A.33

WiFi 2.4G Body Rear 15mm

Date/Time: 2022/5/27
Electronics: DAE4 SN797
Medium: Head 2450MHz
Medium parameters used: f = 2437 MHz; σ = 1.847 S/m; εr = 38.943; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: Wi-Fi 2.4G (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(7.9, 7.9, 7.9)
Area Scan (8x13x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0450 W/kg
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.527 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.116 W/kg
SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.023 W/kg
Maximum value of SAR (measured) = 0.0506 W/kg

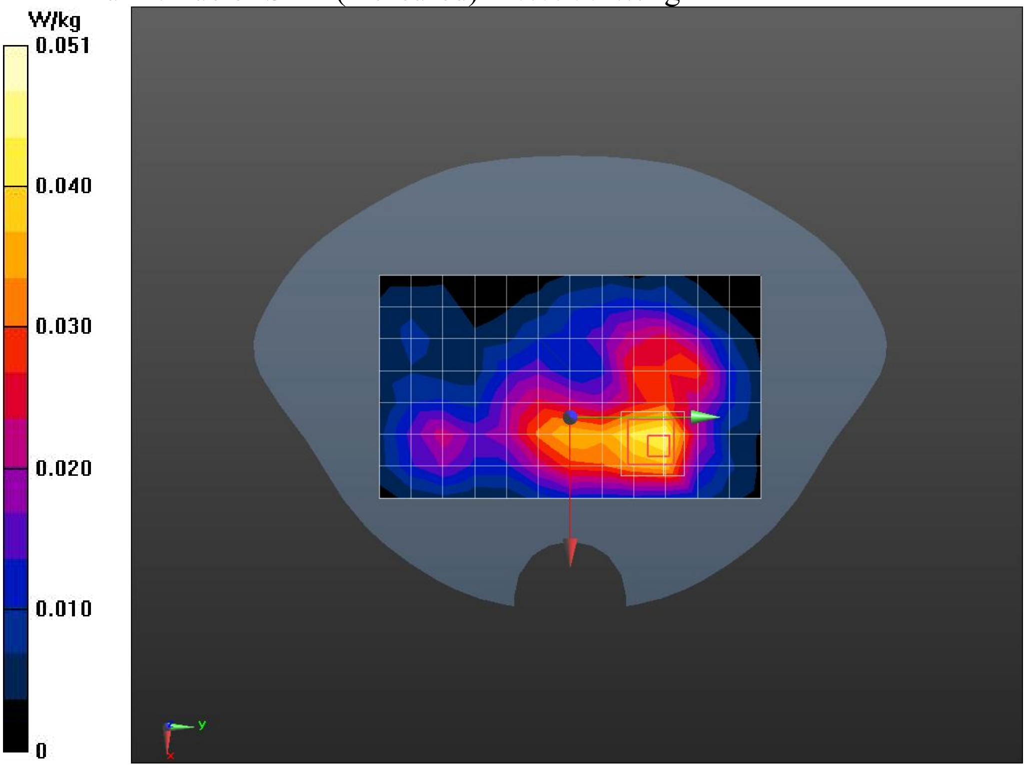

Fig A.34

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ANNEX B. SYSTEM VALIDATION RESULTS

System Verification 750MHz

Date/Time: 2022/5/30
Electronics: DAE4 Sn797
Medium: Dipole 750MHz
Medium parameters used: f = 750 MHz; σ = 0.894 S/m; εr = 42.101; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 750 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.59 10.59, 10.59)
System Verification /Area Scan (7x21x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 2.06 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 48.55 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 2.80 W/kg
SAR(1 g) = 1.92 W/kg; SAR(10 g) = 1.29 W/kg
Maximum value of SAR (measured) = 2.07 W/kg

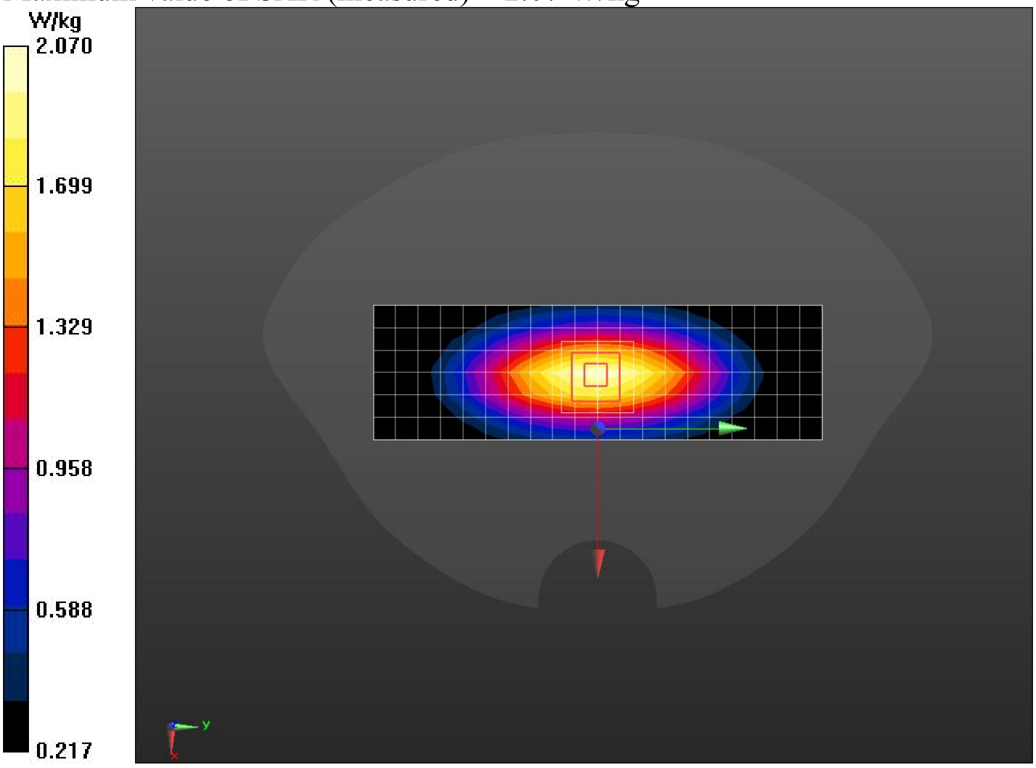

Fig A.35

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System Verification 835MHz

Date/Time: 2022/5/31
Electronics: DAE4 Sn797
Medium: Dipole 835MHz
Medium parameters used: f = 835 MHz; σ = 0.915 S/m; εr = 43.156; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 835 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)
System Verification MHz/Area Scan (5x18x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 2.52 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.77 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.46 W/kg
SAR(1 g) = 2.32 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 2.50 W/kg

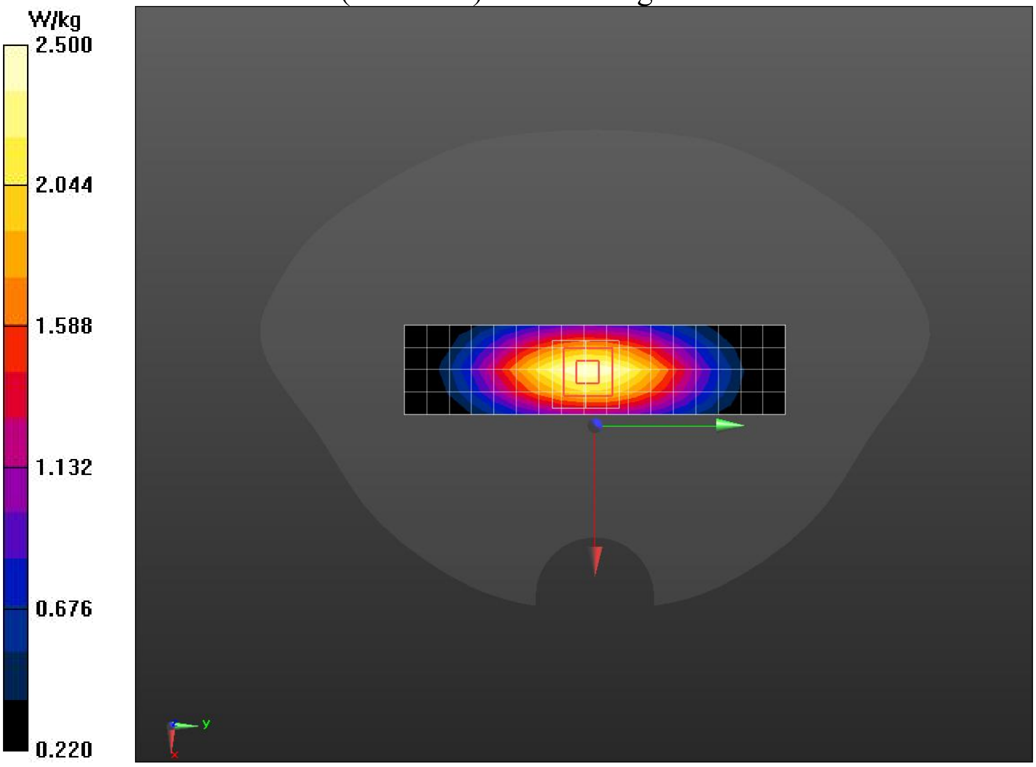

Fig A.36

System Verification 835MHz

Date/Time: 2022/6/1
Electronics: DAE4 Sn797
Medium: Dipole 835MHz
Medium parameters used: f = 835 MHz; σ = 0.902 S/m; εr = 40.993; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 835 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(10.17, 10.17, 10.17)
System Verification /Area Scan (5x18x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 2.49 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.43 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 2.58 W/kg

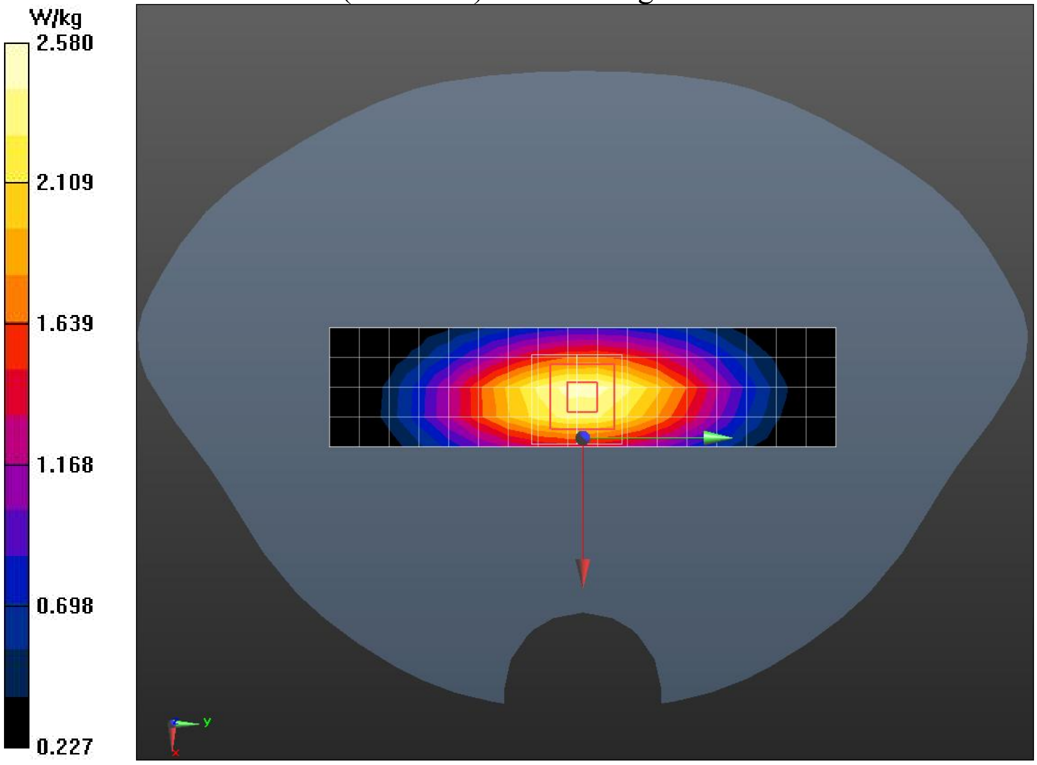

Fig A.37

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System Verification 1750MHz

Date/Time: 2022/5/25
Electronics: DAE4 Sn797
Medium:Dipole 1750MHz
Medium parameters used: f = 1750 MHz; σ = 1.361 S/m; εr = 41.103; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 1750 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
System Verification MHz/Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 9.51 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.33 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 15.0 W/kg
SAR(1 g) = 8.63 W/kg; SAR(10 g) = 4.73 W/kg
Maximum value of SAR (measured) = 9.68 W/kg

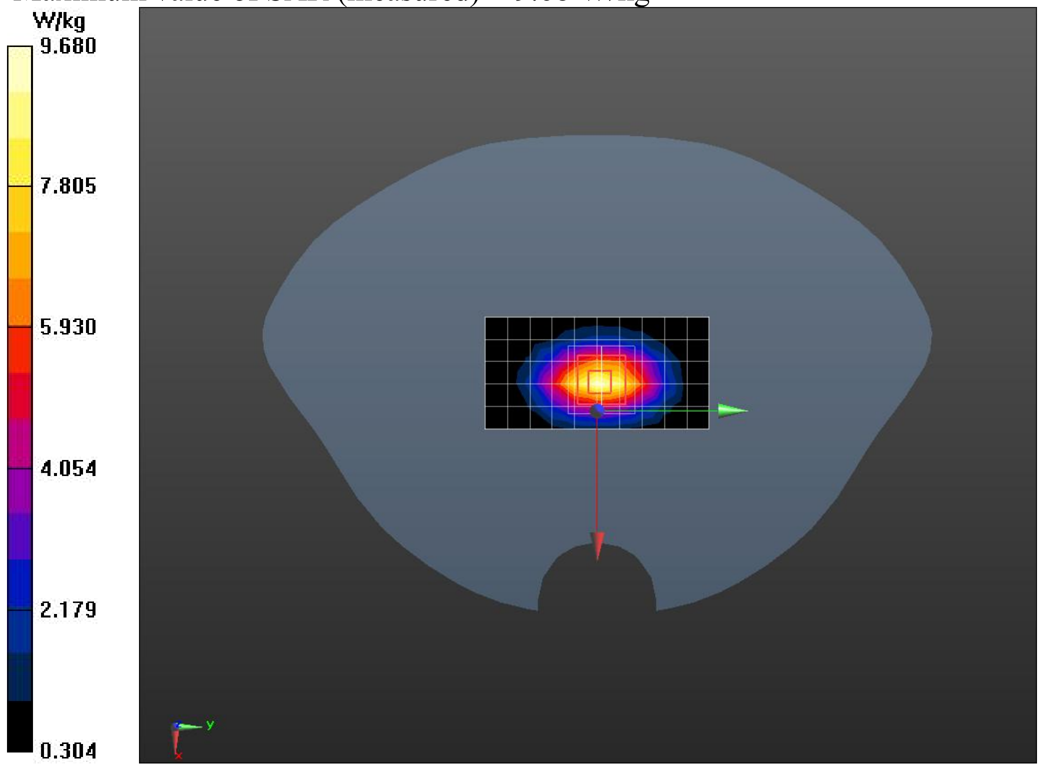

Fig A.38

System Verification 1750MHz

Date/Time: 2022/5/26
Electronics: DAE4 Sn797
Medium:Dipole 1750MHz
Medium parameters used: f = 1750 MHz; σ = 1.361 S/m; εr = 41.103; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 1750 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.62, 8.62, 8.62)
System Verification /Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 10.1 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.28 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.13 W/kg; SAR(10 g) = 4.96 W/kg
Maximum value of SAR (measured) = 10.3 W/kg

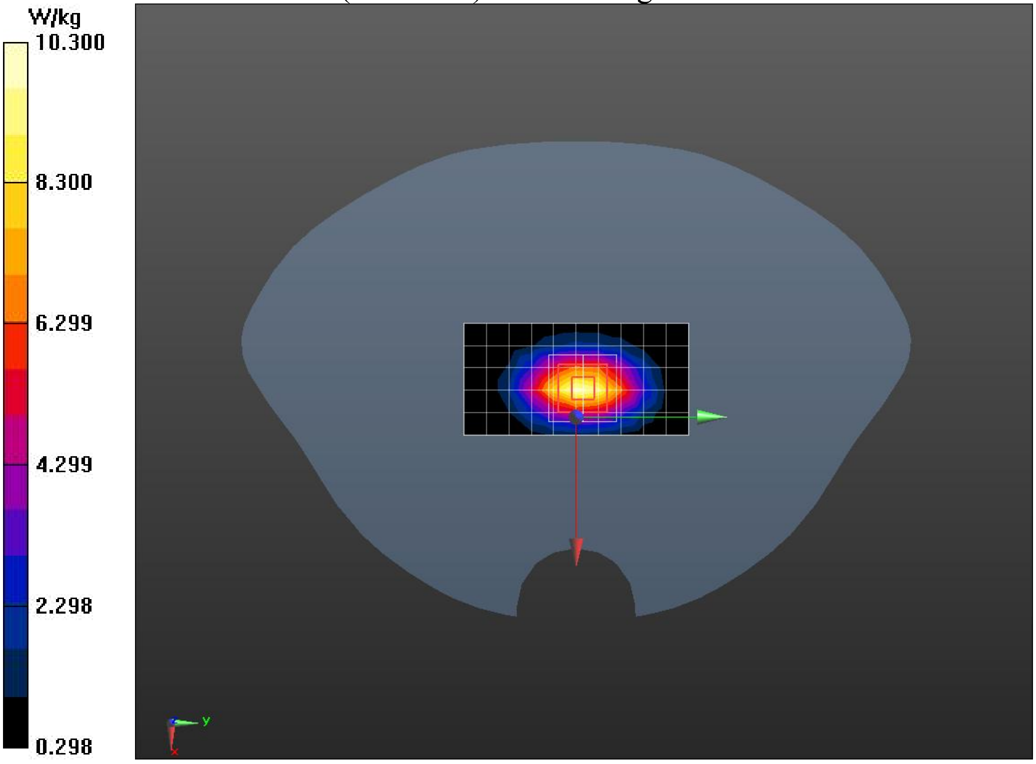

Fig A.39

System Verification 1900MHz

Date/Time: 2022/5/23
Electronics: DAE4 Sn797
Medium: Dipole 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.426 S/m; εr = 39.218; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)
System Verification /Area Scan (5x9x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 9.44 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.22 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 9.31 W/kg; SAR(10 g) = 4.94 W/kg
Maximum value of SAR (measured) = 10.3 W/kg

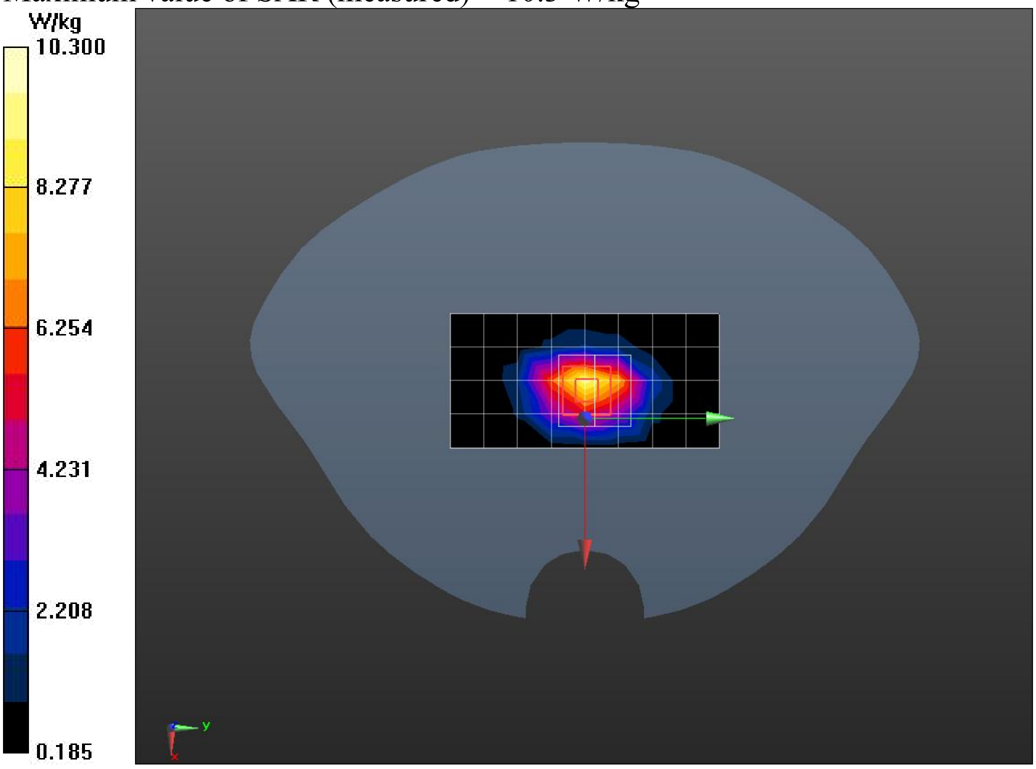

Fig A.40

System Verification 1900MHz

Date/Time: 2022/5/24
Electronics: DAE4 Sn797
Medium: Dipole 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.426 S/m; εr = 39.218; ρ = 1000 kg/m3
Ambient Temperature:22.5°C   Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(8.35, 8.35, 8.35)

System Verification /Area Scan (5x9x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 10.1 W/kg

System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.59 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 9.57 W/kg; SAR(10 g) = 5.02 W/kg
Maximum value of SAR (measured) = 10.6 W/kg

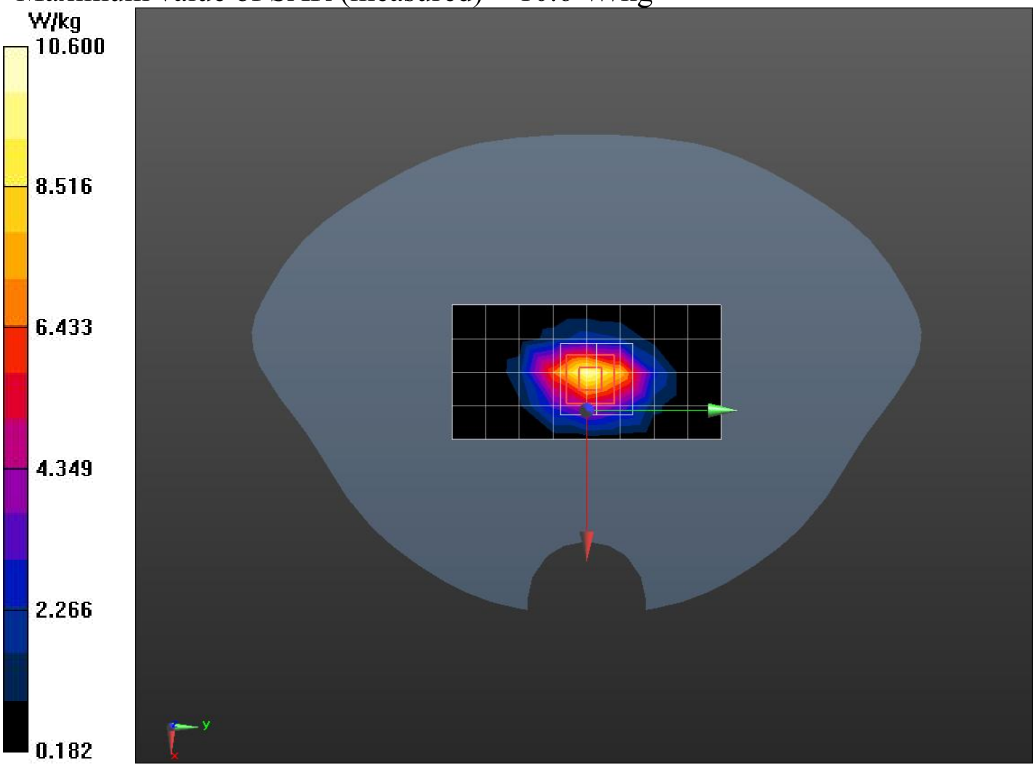

Fig A.41

System Verification 2450MHz

Date/Time: 2022/6/2
Electronics: DAE4 Sn797
Medium: Dipole 2450MHZ
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; εr = 38.897; ρ = 1000 kg/m3
Ambient Temperature:22.5°C Liquid Temperature:22.0°C
Communication System: CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(7.9, 7.9, 7.9)
System Verification /Area Scan (6x9x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 13.2 W/kg
System Verification /Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.70 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 29.3 W/kg
SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.17 W/kg
Maximum value of SAR (measured) = 15.5 W/kg

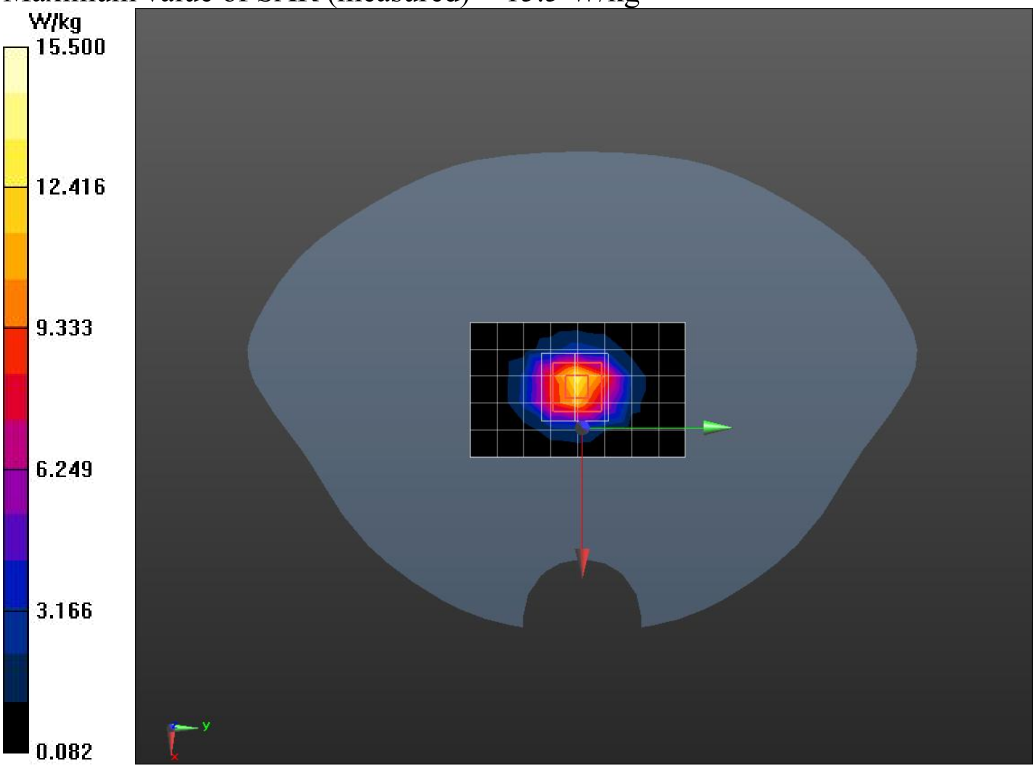

Fig A.42

ANNEX C. CALIBRATION REPORT

In Collaboration with
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CALIBRATION LABORATORY

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中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client : CATR(Chongqing) Certificate No: Z22-60163

CALIBRATION CERTIFICATE

Object	DAE4 - SN: 797
Calibration Procedure(s)	FF-Z11-002-01 Calibration Procedure for the Data Acquisition Electronics (DAEx)
Calibration date:	May 17, 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
Process Calibrator 753	1971018	15-Jun-21 (CTTL, No.J21X04465)	Jun-22

	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: May 23, 2022

Certificate No: Z22-60163 Page 1 of 3

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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	403.835 ± 0.15% (k=2)	404.092 ± 0.15% (k=2)	403.825 ± 0.15% (k=2)
Low Range	3.95845 ± 0.7% (k=2)	3.96789 ± 0.7% (k=2)	3.97952 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	43° ± 1 °

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CALIBRATION
CNAS L0570

Client: 3in

Certificate No: Z21-60208

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN : 7401

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

Calibration date: June 07, 2021

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	16-Jun-20(CTTL, No.J20X04344)	Jun-21
Power sensor NRP-Z91	101547	16-Jun-20(CTTL, No.J20X04344)	Jun-21
Power sensor NRP-Z91	101548	16-Jun-20(CTTL, No.J20X04344)	Jun-21
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 1556	15-Jan-21(SPEAG, No.DAE4-1556_Jan21)	Jan-22

Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	23-Jun-20(CTTL, No.J20X04343)	Jun-21
Network Analyzer E5071C	MY46110673	21-Jan-21(CTTL, No.J20X00515)	Jan-22

	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: June 09, 2021

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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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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7401

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)^2)[A]	0.38	0.45	0.34	±10.0%
DCP(mV)[B]	102.9	101.7	103.3	

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	152.9	±2.3%
		Y	0.0	0.0	1.0		169.2	
		Z	0.0	0.0	1.0		141.7	

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 4).
[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.