Certificate #3682.01

TEST REPORT

No. I19D00082-SAR01

For

Client:	Shanghai Sunmi Technology Co.,Ltd.
Production:	Handheld Wireless Terminal
Model Name:	T8A01
Brand Name:	SUNMI
FCC ID:	2AH25T8A01
Hardware Version:	V1.01
Software Version:	L2K_V1.8_20190426
Issued date:	2019-08-13

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications.
3. KDB has not been approved by A2LA.
4. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

Test Laboratory:
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Revision Version

Report Number	Revision	Date	Memo
I19D00082-SAR01	00	2019-08-13	Initial creation of test report

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name	East China Institute of Telecommunications
Address	7-8/F., Area G, No.666, Beijing East Road, Shanghai, China
Postal Code	200001
Telephone	+86 21 63843300
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1.2. Testing Environment

Normal Temperature	18℃-25℃
Relative Humidity	25%-75%

1.3. Project Data

Project Leader	Yu Anlu
Testing Start Date	2019-06-15
Testing End Date	2019-07-19

1.4. Signature

Yan Hang
(Prepared this test report)

Fu Erliang
(Reviewed this test report)

Zheng Zhongbin
(Approved this test report)

2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **T8A01** are as fol lows

Table 2.1: Max. Reported SAR (1g)

Band	SAR 1g(W/Kg)		
	Head	Body worn(10mm)	Hotspot(10mm)
GSM 850	0.070	0.396	0.396
GSM 1900	0.152	0.390	0.390
WCDMA Band2	0.221	0.516	0.516
WCDMA Band4	0.172	0.376	0.379
WCDMA Band5	0.164	0.522	0.522
LTE Band4	0.140	0.375	0.375
LTE Band7	0.062	0.727	0.727
LTE Band12	0.081	0.178	0.178
LTE Band25	0.297	0.604	0.604
LTE Band26	0.162	0.257	0.257
LTE Band41	0.059	0.790	0.790
CDMA BC0	0.141	0.355	0.355
CDMA BC1	0.209	0.974	0.974
WiFi2.4G	**0.376**	0.075	0.123
WiFi5G	0.060	0.046	0.128

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 C95.1-1999.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

Table 2.2: Simultaneous SAR

Highest Simultaneous Transmission SAR	Highest SAR 1g Head(W/Kg)	Highest SAR 1g Body worn(10mm) (W/Kg)	Highest SAR 1g Body Hotspot(10mm)
	0.583	1.447	1.447

3. Client Information

3.1. Applicant Information

Company Name	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 605, Block 7, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Telephone	86-18721763396
Postcode	N/A

3.2. Manufacturer Information

Company Name	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 605, Block 7, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Telephone	86-18721763396
Postcode	N/A

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

4.1. About EUT

Description:	Handheld Wireless Terminal
Model name:	T8A01
Operation Model(s):	GSM850/GSM900/GSM1800/GSM1900; WCDMA Band I/Band II/Band IV/Band V/BandVIII; LTE 1/2/3/4/5/7/12/17/18/19/25/26/28/41; CDMA BC0/BC1; BT4.0,BLE;WiFi 11a/b/g/n; GPS
Tx Frequency:	824.2-848.8MHz(GSM850) 1850.2-1909.8MHz（GSM1900） 1852.4-1907.6 MHz (WCDMA Band II) 1712.4-1752.6 MHz (WCDMA Band IV) 826.4-846.6MHz (WCDMA Band V) 1850.7 -1909.3 MHz (LTE Band 2) 1710.7 -1754.3 MHz (LTE Band 4) 824.7 -848.3 MHz (LTE Band 5) 2502.5 – 2567.5 MHz (LTE Band 7) 699.7 -715.3 MHz (LTE Band 12) 706.5 -713.5 MHz (LTE Band 17) 1850.7 -1914.3 MHz (LTE Band 25) 814.7 -848.3 MHz (LTE Band 26) 2498.5 - 2687.5MHz (LTE Band 41) 824.7-848.31MHz(CDMA BC0) 1851.25-1908.75MHz(CDMA BC1) 2412- 2462 MHz (WiFi) 5180-5240 MHz(U-NII-1) 5260-5320 MHz(U-NII-2A) 5500-5700 MHz(U-NII-2C) 5745-5825 MHz(U-NII-3) 2402 – 2480 MHz (BT)
Test device Production information: GPRS/EGPRS Class Mode: GPRS/ EGPRS Multislot Class:	Production unit B 12
Device type:	Portable device
Antenna type:	Inner antenna
Accessories/Body-worn configurations:	Battery

Dimensions:	160x73x29mm
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
N04	863036040001422	V1.01	L2K_V1.8_20190426	2019-06-11

*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	Type	Manufacturer
BA01	Battery	N/A	N/A

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

5. Reference Documents

5.1. Documents supplied by applicant

All technical documents are supplied by the client or manufacturer, which is the basis of testing.

5.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
ANSI C95.1	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.	**1999**
IEEE 1528	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.	**2013**
KDB648474	Handset SAR	**D04 v01r03**
KDB248227	802 11 WiFi SAR	**D01 v02r02**
KDB447498	General RF Exposure Guidance	**D01 v06**
KDB865664	SAR Measurement 100 MHz to 6 GHz	**D01 v01r04**
KDB865664	RF Exposure Reporting	**D02 v01r02**
KDB941225	3G SAR Procedures	**D01 v03r01**
KDB 941225	SAR for LTE Devices	**D05 v02r04**
KDB941225	hotspot SAR	**D06 v02r01**

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 bye xperimental techniques or numerical modeling. The standard recommends limits for two tiers of gr oups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposu re 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

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

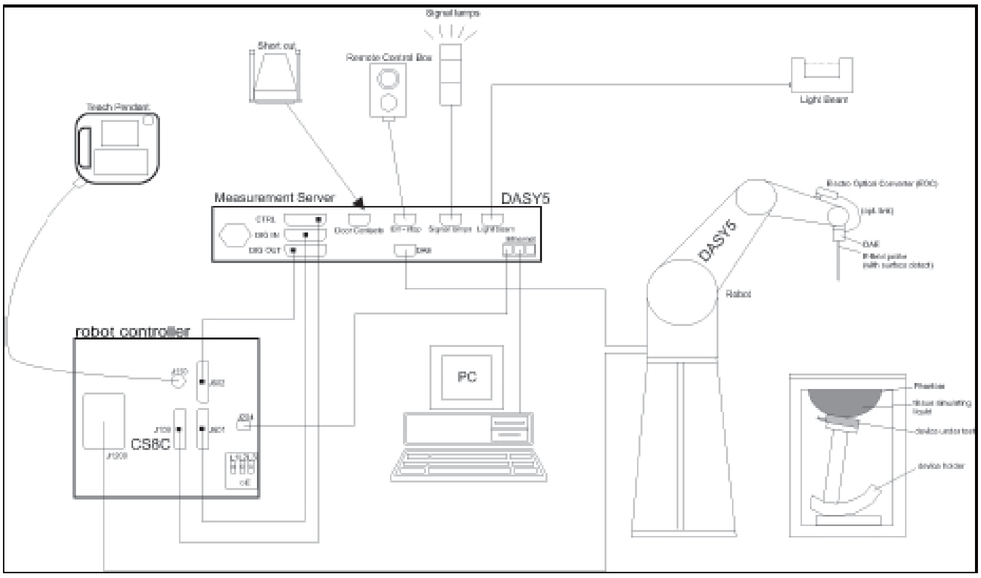
Where: σ is the conductivity of the tissue, ρ is the mass density of tissue and E is the RMS electrical field strength.

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 the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

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 2nd ord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

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

Picture7-2 Near-field Probe

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 the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed 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: 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)

Picture7-5: 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 7-6: 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.

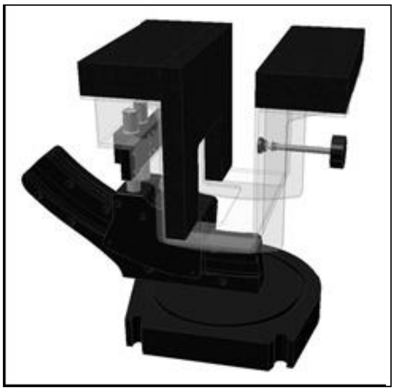
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference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

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

<Laptop Extension Kit>

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

Picture7-7: Device Holder



Picture 7-8: Laptop Extension Kit

7.4.5. Phantom

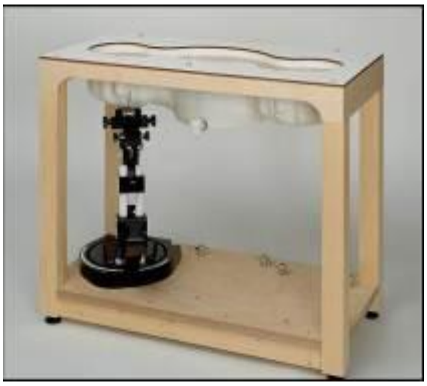
The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset 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

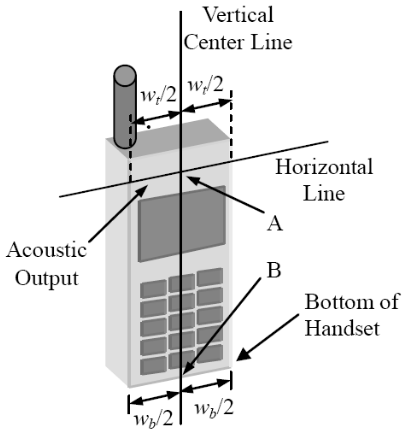


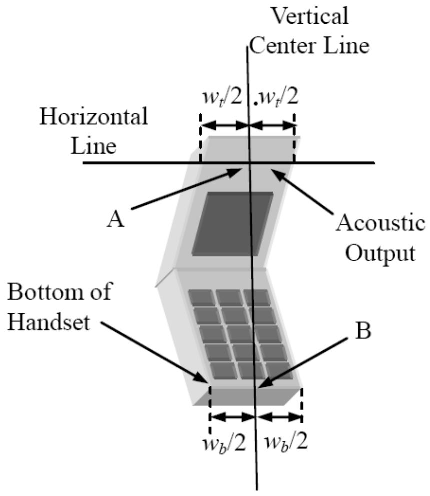
Picture 7-9: SAM Twin Phantom

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

8.1. General considerations

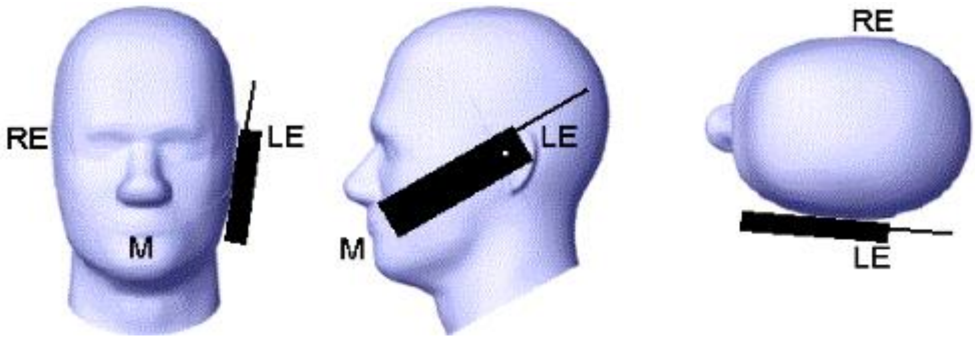
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.



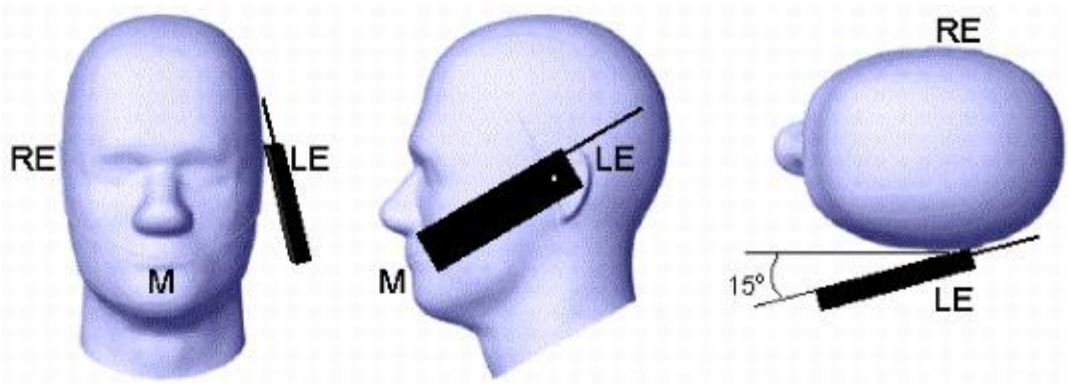


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Picture 8-1 Typical “fixed” case handset **Picture 8-2 Typical “clam-shell” case handset**



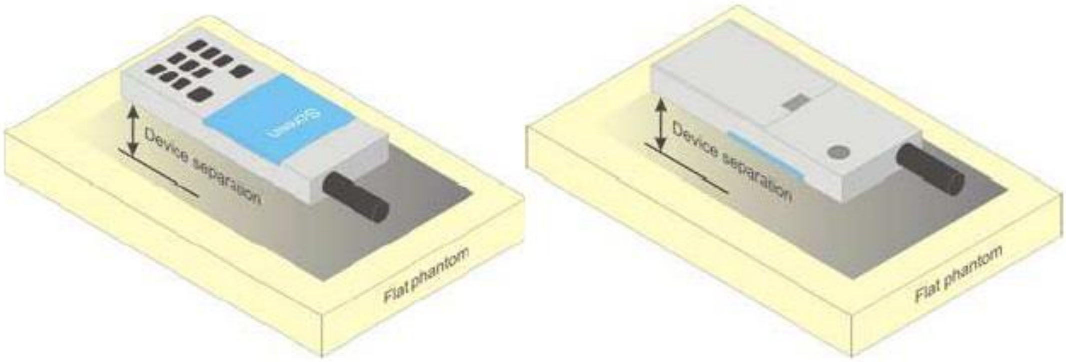
Picture 8-3 Cheek position of the wireless device on the left side of SAM



Picture 8-4 Tilt position of the wireless device on the left side of SAM

8.2. Body-worn device

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

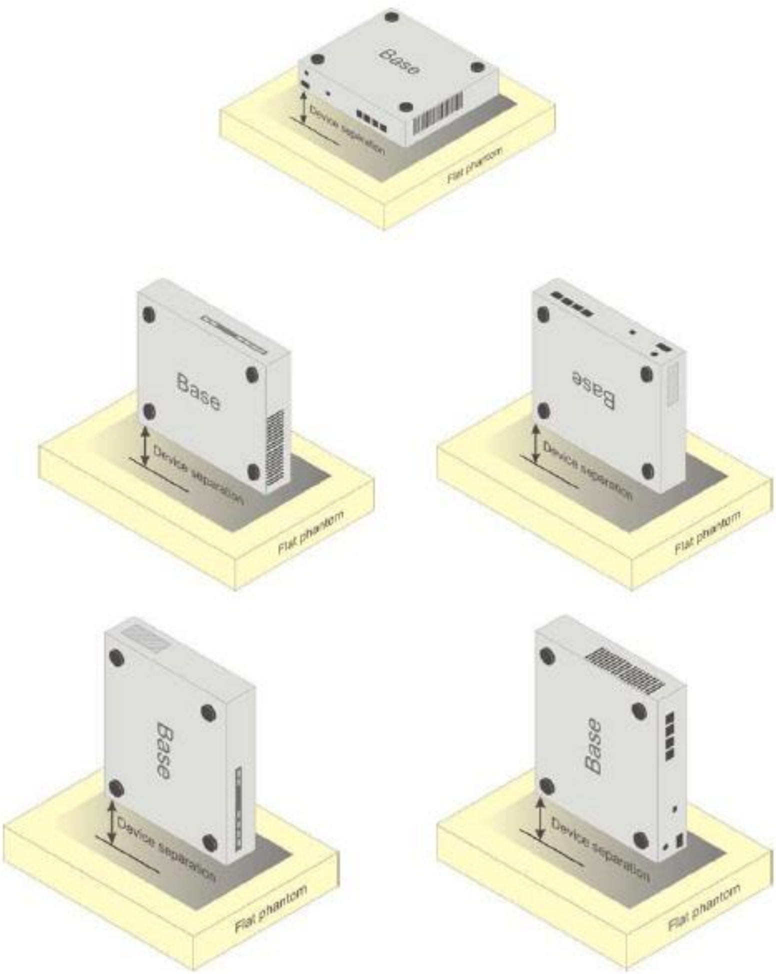


Picture 8-5 Test positions for body-worn devices

8.3. Desktop device

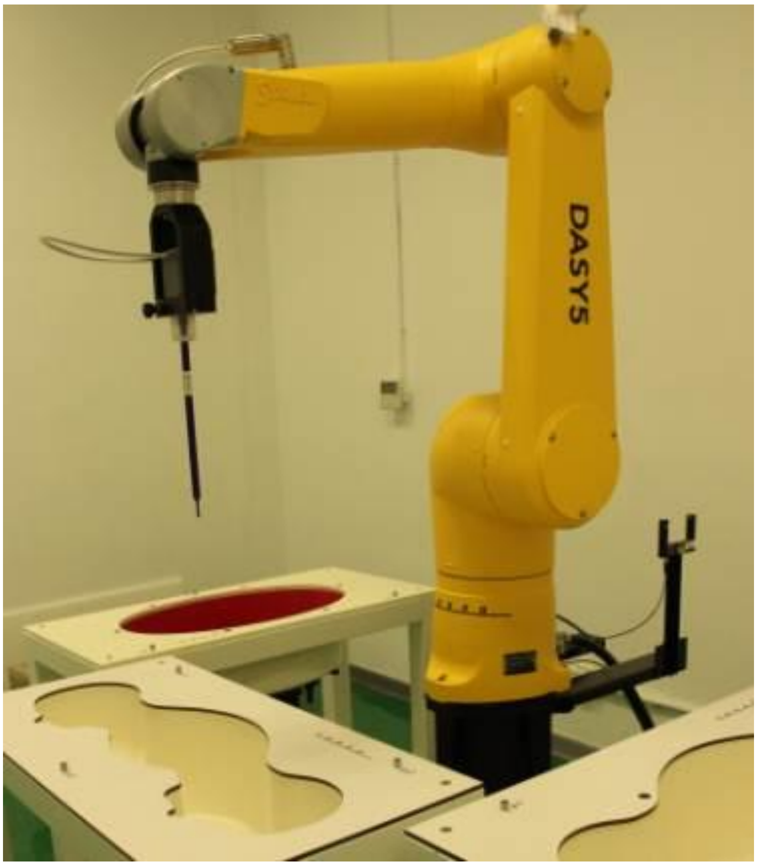
A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom thatcorrespond s to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positi ons specified. Picture 8-6 shows positions for desktop device SAR tests. If the intended use is n ot specified, the device shall be tested directly against the flat phantom.



Picture 8-6 Test positions for desktop devices

8.4. DUT Setup Photos



Picture 8-7: 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, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 9.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

Table 9.1. Composition of the Head Tissue Equivalent Matter

Frequency (MHz)	835	900	1800	1950	2300	2450	2600	5800
Ingredients (% by weight)								
Water	41.45	40.92	55.242	54.89	56.34	58.79	58.79	65.5
Sugar	56.0	56.5	/	/	/	/	/	/
Salt	1.45	1.48	0.306	0.18	0.14	0.06	0.06	/
Preventol	0.1	0.1	/	/	/	/	/	/
Cellulose	1.0	1.0	/	/	/	/	/	/
TritonX-100	/	/	/	/	/	/	/	17.2
Diethyleneglycolmono-hexylether	/	/	/	/	/	/	/	17.3
DGBE	/	/	44.452	44.93	43.52	41.15	41.15	/
Dielectric Parameters Target Value	f=850MHz ε=41.5 σ=0.90	f=900MHz ε=41.5 σ=0.97	f=1800MHz ε=40.0 σ=1.40	f=1950 MHz ε=40.0 σ=1.40	f=2300MHz ε=39.5 σ=1.67	f=2450 MHz ε=39.2 σ=1.80	f=2600 MHz ε=39.0 σ=1.96	f=5800 MHz ε=35.3 σ=5.27

Table 9.1: Targets for tissue simulating liquid

Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
2450	Head	1.80	1.71～1.89	39.2	37.2～41.2
2600	Head	1.96	1.86~2.06	39.0	37.1~40.9
5200	Head	4.66	4.43~4.89	36.0	34.2~37.8
5800	Head	5.27	5.01~5.53	35.3	33.5~37.1

9.2. Dielectric Performance

Table 9.3: Dielectric Performance of Head Tissue Simulating Liquid

Measurement Value						
Liquid Temperature: 22.5 ℃						
Type	**Frequency**	**Permittivity ε**	**Drift (%)**	**Conductivity σ**	**Drift (%)**	Test Date
Head	750 MHz	41.565	-0.80%	0.878	-1.35%	2019-06-20
Head	835 MHz-1	42.632	2.73%	0.931	3.44%	2019-06-16
Head	835 MHz-2	42.971	3.54%	0.939	4.33%	2019-07-18
Head	1800 MHz	39.829	-0.43%	1.365	-2.50%	2019-06-22
Head	1900 MHz-1	41.831	4.58%	1.352	-3.43%	2019-06-15
Head	1900 MHz-2	41.157	2.89%	1.348	-3.71%	2019-07-18
Head	2450 MHz	39.513	0.80%	1.771	-1.61%	2019-07-03
Head	2600 MHz	38.951	-0.13%	1.942	-0.92%	2019-07-19
Head	5200 MHz	37.215	3.38%	4.566	-2.02%	2019-07-04
Head	5800 MHz	36.092	2.24%	5.227	-0.82%	2019-07-04

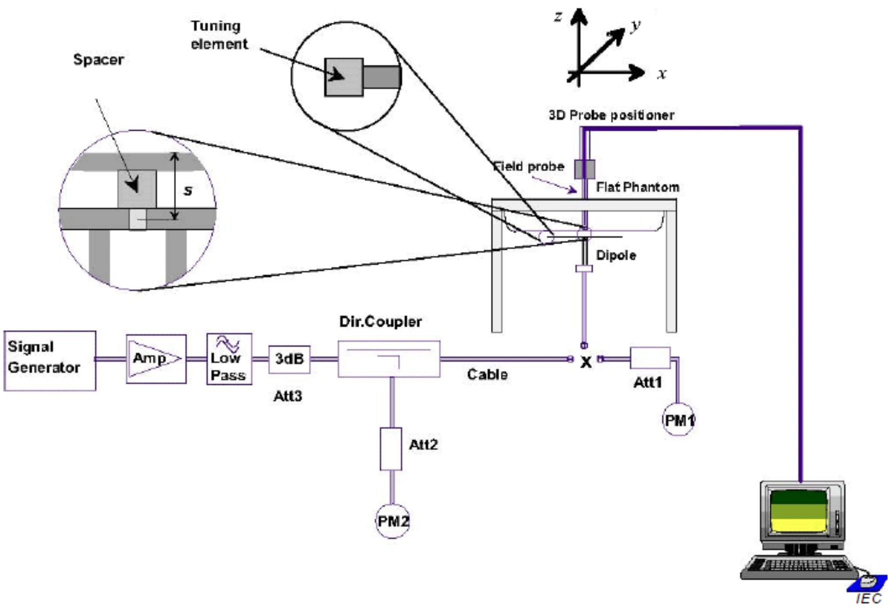
10. System Validation

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 performance 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

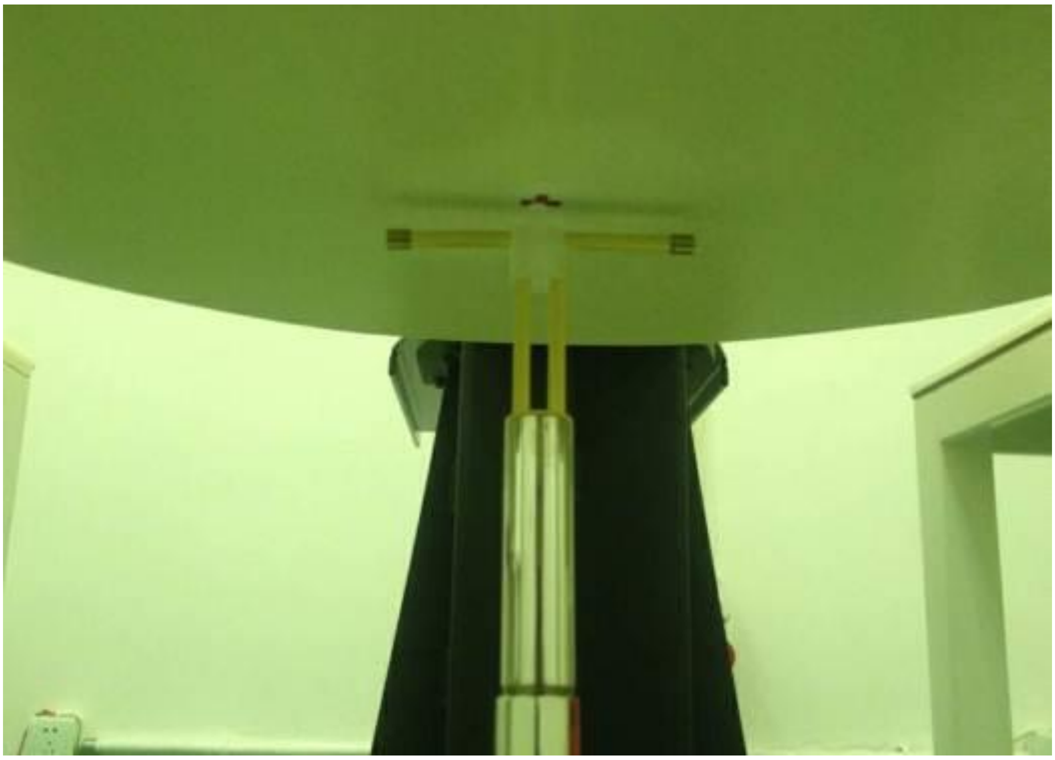
In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. 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 Photo of Dipole Setup

Table 10.1: System Verification of Head

Verification Results							
Input power level: 1W							
Frequency	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**		**Test date**
	10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**	
750 MHz	5.59	8.5	5.52	8.2	-1.25%	-3.53%	2019-06-20
835 MHz-1	6.25	9.63	6.4	9.68	2.40%	0.52%	2019-06-16
835 MHz-2	6.25	9.63	6.44	9.56	3.04%	-0.73%	2019-07-18
1750MHz	19.4	36.5	18.44	34.28	-4.95%	-6.08%	2019-06-22
1900 MHz-1	21.1	40.5	20.8	40.8	-1.42%	0.74%	2019-06-15
1900 MHz-2	21.1	40.5	20.96	41.2	-0.66%	1.73%	2019-07-18
2450 MHz	24.4	52.4	25.04	54.8	2.62%	4.58%	2019-07-03
2600 MHz	25.4	57.2	25.56	56.8	0.63%	-0.70%	2019-07-19
5200 MHz	21.4	74.9	20.7	72.6	-3.27%	-3.07%	2019-07-04
5800 MHz	20.7	73.7	19.9	71.4	-3.86%	-3.12%	2019-07-04

11. Measurement Procedures

11.1. Tests to be performed

According to the SAR test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement

(b) Area scan

(c) Zoom scan

(d) Power drift measurement

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transm it maximum output power

(b) Measure conducted output power through RF cable

(c) Place the EUT in the specific position of phantom as Appendix D demonstrates.

(d) Measure SAR results for Middle channel or the highest power channel on each testing position.

(e) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

(f) Record the SAR value

11.2. General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2013. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

<table>
<tr><td colspan="3"></td><td>$\leq$ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>$\leq$ 2 GHz: $\leq$ 15 mm
2 – 3 GHz: $\leq$ 12 mm</td><td>3 – 4 GHz: $\leq$ 12 mm
4 – 6 GHz: $\leq$ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>$\leq$ 2 GHz: $\leq$ 8 mm
2 – 3 GHz: $\leq$ 5 mm*</td><td>3 – 4 GHz: $\leq$ 5 mm*
4 – 6 GHz: $\leq$ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>$\leq$ 5 mm</td><td>3 – 4 GHz: $\leq$ 4 mm
4 – 5 GHz: $\leq$ 3 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>$\leq$ 4 mm</td><td>3 – 4 GHz: $\leq$ 3 mm
4 – 5 GHz: $\leq$ 2.5 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>$\geq$ 30 mm</td><td>3 – 4 GHz: $\geq$ 28 mm
4 – 5 GHz: $\geq$ 25 mm
5 – 6 GHz: $\geq$ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

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 &$DPDCH_n$), 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	MPR (dB)
1	2/15	15/15	64	2/15	4/15	1.5	0.5
2	12/15	15/15	64	12/15	24/25	2.0	1
3	15/15	8/15	64	15/8	30/15	2.0	1
4	15/15	4/15	64	15/4	30/15	2.0	1

For Release 6 HSUPA 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	2.0	1.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	12/15	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	3.0	2.0	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	2.0	1.0	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	2.0	1.0	21	81

11.4. Bluetooth & WiFi 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.

11.5. 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 14 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

12. Conducted Output Power

12.1. Manufacturing tolerance

Table 12.1: GSM Speech

GSM 850			
Channel	Channel 128	Channel 190	Channel 251
Maximum Target Value (dBm)	32	32	32
GSM1900			
Channel	Channel 512	Channel 661	Channel 810
Maximum Target Value (dBm)	30	30	30

Table 12.2: GPRS (GMSK Modulation)

GSM 850				
Channel		**128**	**190**	**251**
1 Txslots	Maximum Target Value (dBm)	32	32	32
2 Txslots	Maximum Target Value (dBm)	31	31	31
3 Txslots	Maximum Target Value (dBm)	29	29	29
4 Txslots	Maximum Target Value (dBm)	27	27	27
GSM 1900				
Channel		**512**	**661**	**810**
1 Txslots	Maximum Target Value (dBm)	30	30	30
2 Txslots	Maximum Target Value (dBm)	27.5	27.5	27.5
3 Txslots	Maximum Target Value (dBm)	25.5	25.5	25.5
4 Txslots	Maximum Target Value (dBm)	24	24	24

Table 12.3: EGPRS (8-PSK Modulation)

GSM 850				
Channel		**128**	**190**	**251**
1 Txslots	Maximum Target Value (dBm)	24	24	24
2 Txslots	Maximum Target Value (dBm)	24	24	24
3 Txslots	Maximum Target Value (dBm)	22.5	22.5	22.5
4 Txslots	Maximum Target Value (dBm)	21	21	21
GSM 1900				
Channel		**512**	**661**	**810**
1 Txslots	Maximum Target Value (dBm)	25	25	25
2 Txslots	Maximum Target Value (dBm)	24	24	24
3 Txslots	Maximum Target Value (dBm)	22	22	22
4 Txslots	Maximum Target Value (dBm)	20.5	20.5	20.5

Table 12.4: WCDMA

WCDMA Band II			
Channel	Channel 9262	Channel 9400	Channel 9538
Maximum Target Value (dBm)	24	24	24

WCDMA Band II **HSDPA**				
Channel		9262	9400	9538
1	Maximum Target Value (dBm)	23.5	23.5	23.5
2	Maximum Target Value (dBm)	23	23	23
3	Maximum Target Value (dBm)	22.5	22.5	22.5
4	Maximum Target Value (dBm)	22.5	22.5	22.5
WCDMA Band II **HSUPA**				
Channel		9262	9400	9538
1	Maximum Target Value (dBm)	22.5	22.5	22.5

2	Maximum Target Value (dBm)	22.5	22.5	22.5
3	Maximum Target Value (dBm)	22.5	22.5	22.5
4	Maximum Target Value (dBm)	22.5	22.5	22.5
5	Maximum Target Value (dBm)	22.5	22.5	22.5

Table 12.5: WCDMA

WCDMA Band IV			
Channel	Channel 1312	Channel 1413	Channel 1513
Maximum Target Value (dBm)	24	24	24

WCDMA Band IV **HSDPA**				
Channel		1312	1413	1513
1	Maximum Target Value (dBm)	23.5	23.5	23.5
2	Maximum Target Value (dBm)	23	23	23
3	Maximum Target Value (dBm)	22.5	22.5	22.5
4	Maximum Target Value (dBm)	22.5	22.5	22.5
WCDMA Band IV **HSUPA**				
Channel		1312	1413	1513
1	Maximum Target Value (dBm)	22.5	22.5	22.5
2	Maximum Target Value (dBm)	22.5	22.5	22.5
3	Maximum Target Value (dBm)	22.5	22.5	22.5
4	Maximum Target Value (dBm)	22.5	22.5	22.5
5	Maximum Target Value (dBm)	22.5	22.5	22.5

Table 12.6: WCDMA

WCDMA Band V			
Channel	4132	4183	4233
Maximum Target Value (dBm)	24	24	24

WCDMA Band V **HSDPA**				
Channel		4132	4183	4233
1	Maximum Target Value (dBm)	23.5	23.5	23.5
2	Maximum Target Value (dBm)	23	23	23
3	Maximum Target Value (dBm)	22.5	22.5	22.5
4	Maximum Target Value (dBm)	22.5	22.5	22.5
WCDMA Band V **HSUPA**				
Channel		4132	4183	4233
1	Maximum Target Value (dBm)	22.5	22.5	22.5
2	Maximum Target Value (dBm)	22.5	22.5	22.5
3	Maximum Target Value (dBm)	22.5	22.5	22.5
4	Maximum Target Value (dBm)	22.5	22.5	22.5
5	Maximum Target Value (dBm)	22.5	22.5	22.5

Table 12.7: LTE

LTE Band4			
RB Size	1	50%	100%
Maximum Target Value (dBm)	23.5	23.5	22.5
LTE Band7			
RB Size	1	50%	100%
Maximum Target Value (dBm)	24	22.5	22.5
LTE Band12			
RB Size	1	50%	100%
Maximum Target Value (dBm)	24	24	24
LTE Band25			
RB Size	1	50%	100%
Maximum Target Value (dBm)	23.5	23	23
LTE Band26			
RB Size	1	50%	100%
Maximum Target Value (dBm)	23.5	23.5	22.5
LTE Band41			
RB Size	1	50%	100%
Maximum Target Value (dBm)	24.0	23.0	23.0

Table 12.8: WiFi

WiFi 802.11b 2.4G				
Channel	Channel 1	Channel 6	Channel 11	
Maximum Target Value (dBm)	20	20	20	
WiFi 802.11g 2.4G				
Channel	Channel 1	Channel 6	Channel 11	
Maximum Target Value (dBm)	16	17	17	
WiFi 802.11n 20M 2.4G				
Channel	Channel 1	Channel 6	Channel 11	
Maximum Target Value (dBm)	14.5	14.5	15	
WiFi 802.11n 40M 2.4G				
Channel	Channel 3	Channel 6	Channel 9	
Maximum Target Value (dBm)	15.5	15	15.5	
WiFi 802.11a				
Band	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
Maximum Target Value (dBm)	13	11	12	13
WiFi 802.11n HT20				
Band	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
Maximum Target Value (dBm)	12	11	10.5	12.5
WiFi 802.11n HT40				
Band	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
Maximum Target Value (dBm)	11.5	9.5	9.5	11

Table 12.9: Bluetooth

Bluetooth			
Channel	Channel 0	Channel 39	Channel 78
Maximum Target Value (dBm)	9.5	9.5	9.5

Table 12.10: BLE

BLE			
Channel	Channel 0	Channel 19	Channel 39
Maximum Target Value (dBm)	1	1	1

12.2. GSM Measurement result

Table 12.11: The conducted power measurement results for GSM

GSM 850MHZ	**Conducted Power (dBm)**		
	Channel 128(824.2MHz)	**Channel 190(836.6MHz)**	**Channel 251(848.8MHz)**
	31.05	31.18	31.33
GSM 1900MHZ	**Conducted Power(dBm)**		
	Channel 512(1850.2MHz)	**Channel 661(1880 MHz)**	**Channel 810(1909.8MHz)**
	28.61	28.93	28.96

Table 12.12: The conducted power measurement results for GPRS/EGPRS

GSM 850 GMSK	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	128	**190**	**251**		**128**	**190**	**251**
1 Txslot	31.11	30.86	30.99	-9.03dB	22.08	21.83	21.96
2 Txslots	29.77	29.93	30.02	-6.02dB	23.75	23.91	24
3 Txslots	28.29	28.31	28.35	-4.26dB	24.03	24.05	24.09
4 Txslots	26.03	26.12	26.28	-3.01dB	23.02	23.11	23.27
GSM 1900 GMSK	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	512	**661**	**810**		**512**	**661**	**810**
1 Txslot	28.67	28.63	28.64	-9.03dB	19.64	19.6	19.61
2 Txslots	26.31	26.56	26.62	-6.02dB	20.29	20.54	**20.6**
3Txslots	24.85	24.83	24.81	-4.26dB	20.59	20.57	20.55
4 Txslots	23.17	23.2	23.33	-3.01dB	20.16	20.19	20.32

Table 12.13: The conducted power measurement results for E-GPRS

GSM 850 8-PSK	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	128	**190**	**251**		**128**	**190**	**251**
1 Txslot	23.41	23.44	23.48	-9.03dB	14.38	14.41	14.45
2 Txslots	23.35	23.34	23.77	-6.02dB	17.33	17.32	17.75
3 Txslots	21.72	21.77	21.72	-4.26dB	17.46	17.51	17.46
4 Txslots	20.17	20.26	20.15	-3.01dB	17.16	17.25	17.14
GSM 1900 8-PSK	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	512	**661**	**810**		**512**	**661**	**810**
1 Txslot	24.15	24.17	24.16	-9.03dB	15.12	15.14	15.13
2 Txslots	23.34	23.32	23.26	-6.02dB	17.32	17.3	17.24
3 Txslots	21.12	21.14	21.03	-4.26dB	16.86	16.88	16.77
4 Txslots	19.57	19.61	19.42	-3.01dB	16.56	16.6	16.41

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 3Txslots for 850MHz ; 2Txslots for1900MHz;

12.3. WCDMA Measurement result

Table 12.14: The conducted Power for WCDMA

Item	band	WCDMA BAND II result(dBm)		
	ARFCN	9262 (1852.4MHz)	9400 (1880.0MHz)	9538 (1907.6MHz)
WCDMA	\	23.48	23.57	23.51
HSDPA	1	22.76	22.84	22.77
	2	22.54	22.64	22.59
	3	22.21	22.34	22.3
	4	22.13	22.24	22.17
HSUPA	1	22.11	22.24	22.16
	2	22.16	22.18	22.2
	3	22.15	22.32	22.13
	4	21.96	22.02	22.04
	5	21.76	21.92	21.93
Item	band	WCDMA BAND IV result(dBm)		
	ARFCN	Channel 1312 (1712.4MHz)	Channel 1413 (1732.6MHz)	Channel 1513 (1752.6MHz)
WCDMA	\	23.58	23.37	23.38
HSDPA	1	22.8	22.68	22.62
	2	22.58	22.48	22.44
	3	22.25	22.18	22.15
	4	22.17	22.08	22.02
HSUPA	1	22.15	22.08	22.01
	2	22.2	22.02	22.05
	3	22.19	22.16	21.98
	4	22	21.86	21.89
	5	21.8	21.76	21.78
Item	band	WCDMA BAND V result(dBm)		
	ARFCN	Channel 4132 (826.4MHz)	Channel 4183 (836.6MHz)	Channel 4233 (846.6MHz)
WCDMA	\	23.32	23.23	23.15
HSDPA	1	22.64	22.48	22.4
	2	22.42	22.28	22.22
	3	22.09	21.98	21.93
	4	22.01	21.88	21.8
HSUPA	1	21.99	21.88	21.79
	2	22.04	21.82	21.83
	3	22.03	21.96	21.76
	4	21.84	21.66	21.67
	5	21.64	21.56	21.56

12.4. LTE Measurement result

Table 12.15: The conducted Power for LTE Band 2/4/5/7/12/17/18/19/25/26/38/41

LTE-FDD Band 2			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			19193	18900	18607	19185	18900	18615
1RB	High	QPSK	22.46	22.02	22.02	22.37	22.33	22.25
		16QAM	20.85	20.65	20.78	20.89	20.92	20.53
	Middle	QPSK	22.44	22.03	22.12	22.42	22.38	22.34
		16QAM	21.08	20.97	20.94	21.20	21.01	20.86
	Low	QPSK	22.26	22.06	22.03	22.45	22.35	22.20
		16QAM	20.89	20.85	20.70	20.94	20.83	20.59
50%RB	High	QPSK	22.41	22.35	22.15	21.42	21.32	21.20
		16QAM	21.27	21.06	20.92	20.70	20.50	20.35
	Middle	QPSK	22.40	22.30	22.15	21.46	21.35	21.22
		16QAM	21.26	21.17	21.00	20.73	20.46	20.37
	Low	QPSK	22.41	22.29	22.09	21.58	21.37	21.17
		16QAM	21.37	21.15	20.92	20.74	20.46	20.31
100%RB	/	QPSK	21.30	21.22	21.05	21.56	21.35	21.20
		16QAM	20.29	20.04	20.13	20.25	20.32	20.17
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			19175	18900	18625	19150	18900	18650
1RB	High	QPSK	22.36	22.06	22.26	22.54	22.52	22.01
		16QAM	21.13	20.63	20.81	21.17	21.04	20.83
	Middle	QPSK	22.52	22.13	22.10	22.59	-37.82	22.21
		16QAM	21.20	20.99	20.93	21.39	20.69	21.34
	Low	QPSK	22.30	22.31	22.10	22.53	22.23	22.18
		16QAM	20.98	20.97	20.50	21.05	20.98	20.71
50%RB	High	QPSK	21.58	21.30	21.28	21.60	21.17	21.09
		16QAM	20.46	20.18	20.13	20.42	20.37	20.14
	Middle	QPSK	21.64	21.45	21.29	21.50	21.05	21.23
		16QAM	20.40	20.31	20.14	20.45	20.49	20.30

	Low	QPSK	21.50	21.42	21.24	21.43	21.09	21.15
		16QAM	20.50	20.26	20.08	20.34	20.47	20.25
100%RB	/	QPSK	21.48	21.44	21.27	21.44	21.11	21.16
		16QAM	20.57	20.39	20.08	20.41	20.35	20.30
LTE-FDD Band 2			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			19125	18900	18675	19100	18900	18700
1RB	High	QPSK	22.43	22.50	22.10	22.29	22.31	22.26
		16QAM	21.68	20.98	20.72	21.11	20.90	20.85
	Middle	QPSK	22.36	22.34	22.27	22.54	22.50	22.40
		16QAM	20.84	20.89	20.89	20.98	21.49	20.83
	Low	QPSK	22.38	22.38	22.07	22.27	22.47	22.25
		16QAM	20.99	20.70	20.97	21.11	20.60	20.81
50%RB	High	QPSK	21.40	21.33	21.39	21.50	21.48	21.42
		16QAM	20.48	20.25	20.32	20.49	20.47	20.48
	Middle	QPSK	21.41	21.38	21.36	21.45	21.44	21.37
		16QAM	20.39	20.24	20.38	20.49	20.52	20.33
	Low	QPSK	21.35	21.43	21.32	21.46	21.40	21.36
		16QAM	20.32	20.37	20.29	20.59	20.39	20.42
100%RB	/	QPSK	21.31	21.42	21.26	21.42	21.34	21.32
		16QAM	20.40	20.55	20.20	20.61	20.40	20.37

LTEFDD Band 4			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			20393	20175	19957	20385	20175	19965
1RB	High	QPSK	22.45	22.72	22.66	22.72	22.74	22.85
		16QAM	21.33	21.43	21.42	21.27	21.12	21.13
	Middle	QPSK	22.67	22.82	22.76	22.65	22.89	23.03
		16QAM	21.45	21.75	21.50	21.32	21.51	21.54
	Low	QPSK	22.58	22.71	22.74	22.67	22.74	22.91
		16QAM	21.33	21.40	21.41	21.36	21.32	21.26
50%RB	High	QPSK	22.72	22.81	22.93	21.73	21.74	21.89
		16QAM	21.58	21.62	21.97	20.75	20.81	20.88
	Middle	QPSK	22.76	23.02	22.80	21.54	21.79	21.83
		16QAM	21.70	22.05	21.95	20.90	20.85	20.80
	Low	QPSK	22.83	22.97	22.87	21.65	21.87	21.75
		16QAM	21.58	21.68	21.59	20.81	20.81	20.80
100%RB	/	QPSK	21.68	21.78	21.79	21.70	21.76	21.79
		16QAM	20.48	20.53	20.56	20.57	20.77	20.76
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			20375	20175	19975	20350	20175	20000
1RB	High	QPSK	22.64	22.81	22.61	22.74	22.78	22.94
		16QAM	21.28	21.25	21.43	22.14	21.52	21.38
	Middle	QPSK	22.68	22.84	22.76	22.66	-38.83	22.84
		16QAM	21.52	21.43	21.67	21.75	21.63	21.79
	Low	QPSK	22.55	22.74	22.74	22.68	22.77	22.90
		16QAM	21.20	21.45	21.08	21.37	21.70	21.41
50%RB	High	QPSK	21.82	21.77	21.85	21.68	21.69	21.87
		16QAM	20.55	20.45	20.61	20.79	20.86	20.80
	Middle	QPSK	21.74	21.81	21.79	21.68	21.65	21.82
		16QAM	20.52	20.81	20.74	20.78	20.71	20.81
	Low	QPSK	21.78	21.81	21.73	21.70	21.77	21.84
		16QAM	20.68	20.58	20.63	20.62	20.76	20.64
100%RB	/	QPSK	21.72	21.81	21.75	21.63	21.74	21.77
		16QAM	20.69	20.78	20.70	20.73	20.67	20.87

LTE-FDD Band 4			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			20325	20175	20025	20300	20175	20050
1RB	High	QPSK	22.67	22.78	22.70	22.69	22.74	22.71
		16QAM	21.60	21.27	21.59	21.50	21.31	21.56
	Middle	QPSK	22.57	22.92	22.82	22.79	22.87	22.88
		16QAM	21.26	21.32	21.71	21.44	21.53	21.66
	Low	QPSK	22.88	23.04	22.86	23.14	23.17	22.68
		16QAM	21.61	21.22	21.71	21.73	21.74	21.61
50%RB	High	QPSK	21.76	21.89	21.93	21.82	21.84	21.89
		16QAM	20.83	20.80	20.77	20.67	20.77	20.82
	Middle	QPSK	21.82	21.92	22.02	21.92	21.99	21.86
		16QAM	20.70	20.82	20.90	20.85	20.94	21.01
	Low	QPSK	21.79	21.92	21.99	21.89	21.94	21.95
		16QAM	20.67	20.81	20.85	20.98	20.75	21.01
100%RB	/	QPSK	21.71	21.87	21.89	21.86	21.97	21.92
		16QAM	20.77	20.86	20.82	20.84	20.77	20.84

LTE-FDD Band 5			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			20643	20525	20407	20635	20525	20415
1RB	High	QPSK	22.67	22.69	22.80	22.72	22.76	22.69
		16QAM	21.43	21.31	21.43	21.27	21.54	21.31
	Middle	QPSK	22.48	22.62	22.81	22.76	22.90	22.96
		16QAM	21.58	21.71	21.65	21.54	21.44	21.48
	Low	QPSK	22.71	22.75	22.74	22.81	22.77	22.62
		16QAM	21.34	21.39	21.26	21.50	21.22	21.37
50%RB	High	QPSK	22.92	22.89	22.93	21.91	21.83	21.92
		16QAM	21.65	21.60	21.67	20.97	20.93	20.98
	Middle	QPSK	22.86	22.83	22.74	21.84	21.80	21.89
		16QAM	21.81	22.07	21.75	20.89	20.84	20.92
	Low	QPSK	22.95	22.96	22.72	21.80	21.78	21.87
		16QAM	21.99	21.61	21.66	20.95	20.78	20.90
100%RB	/	QPSK	21.81	21.92	21.87	21.74	21.78	21.88
		16QAM	20.69	20.46	20.94	20.67	20.72	20.87
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			20625	20525	20425	20600	20525	20450
1RB	High	QPSK	22.70	22.59	22.73	22.65	22.58	22.74
		16QAM	21.27	21.19	21.22	21.54	21.41	21.60
	Middle	QPSK	22.68	22.78	22.65	22.78	22.77	22.92
		16QAM	21.55	21.40	21.41	21.68	21.59	21.49
	Low	QPSK	22.69	22.77	22.59	22.59	22.76	22.52
		16QAM	21.29	21.26	21.14	21.32	21.54	21.34
50%RB	High	QPSK	21.70	21.67	21.87	21.65	21.71	21.82
		16QAM	20.71	20.63	20.55	20.85	20.63	20.62
	Middle	QPSK	21.71	21.71	21.76	21.72	21.82	21.87
		16QAM	20.59	20.54	20.73	20.73	20.87	20.92
	Low	QPSK	21.71	21.71	21.79	21.76	21.82	21.85
		16QAM	20.62	20.68	20.83	20.74	20.88	21.10
100%RB	/	QPSK	21.62	21.74	21.75	21.67	21.80	21.75
		16QAM	20.80	20.71	20.74	20.59	20.84	20.92

LTE-FDD Band 7			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			21425	21100	20775	21400	21100	20800
1RB	High	QPSK	22.70	22.53	22.29	23.44	23.23	22.73
		16QAM	21.34	20.96	21.27	21.64	21.35	21.19
	Middle	QPSK	22.82	22.81	22.58	22.82	22.32	22.46
		16QAM	21.36	21.50	21.42	21.84	21.41	21.25
	Low	QPSK	22.33	22.42	22.40	22.95	22.36	22.70
		16QAM	20.81	21.25	21.06	21.32	21.59	21.27
50%RB	High	QPSK	21.68	21.64	21.66	21.78	21.63	21.60
		16QAM	20.64	20.68	20.71	21.01	20.76	20.71
	Middle	QPSK	21.54	21.78	21.68	21.80	21.61	21.68
		16QAM	20.68	20.58	20.50	20.73	20.70	20.68
	Low	QPSK	21.59	21.65	21.67	21.72	21.62	21.69
		16QAM	20.57	20.57	20.57	20.74	20.75	20.82
100%RB	/	QPSK	21.57	21.65	21.56	21.74	21.65	21.72
		16QAM	20.68	20.80	20.86	20.69	20.77	20.58
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			21375	21100	20825	21350	21100	20850
1RB	High	QPSK	23.08	22.52	22.40	23.63	22.66	22.72
		16QAM	20.90	21.65	21.35	20.90	21.92	21.45
	Middle	QPSK	22.47	22.29	22.33	22.72	22.54	22.88
		16QAM	21.34	21.14	21.27	21.52	21.35	21.61
	Low	QPSK	22.68	22.76	22.51	22.72	22.60	22.75
		16QAM	21.51	21.74	21.35	21.39	22.05	21.28
50%RB	High	QPSK	21.70	21.68	21.62	21.89	21.69	21.81
		16QAM	20.85	20.59	20.74	20.74	20.71	20.84
	Middle	QPSK	21.76	21.62	21.58	21.88	21.82	21.73
		16QAM	20.61	20.62	20.82	20.65	20.62	20.87
	Low	QPSK	21.68	21.64	21.70	21.82	21.75	21.78
		16QAM	20.80	20.69	20.66	20.86	20.89	20.84
100%RB	/	QPSK	21.68	21.66	21.68	21.82	21.82	21.79
		16QAM	20.78	20.69	20.98	20.72	20.70	20.84

LTE-FDD Band 12			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			23173	23095	23017	23165	23095	23025
1RB	High	QPSK	22.96	23.08	22.90	23.16	23.06	22.92
		16QAM	21.83	21.70	21.37	22.33	21.53	21.89
	Middle	QPSK	23.01	23.10	22.91	23.18	23.28	23.05
		16QAM	21.94	21.79	21.81	21.70	21.67	21.99
	Low	QPSK	23.09	22.98	22.95	23.06	23.15	22.67
		16QAM	21.74	21.55	21.72	21.61	21.71	21.85
50%RB	High	QPSK	23.25	23.20	23.14	22.26	22.16	22.20
		16QAM	22.42	21.80	22.52	21.38	21.32	21.28
	Middle	QPSK	23.25	23.32	23.09	22.20	22.05	22.14
		16QAM	22.40	22.03	22.35	21.26	21.26	21.23
	Low	QPSK	23.25	23.14	23.12	22.21	22.07	22.27
		16QAM	22.14	21.69	22.16	21.18	21.27	21.13
100%RB	/	QPSK	22.18	22.09	22.17	22.20	22.03	22.21
		16QAM	20.98	20.78	20.99	21.04	20.81	21.13
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			23155	23095	23035	23130	23095	23060
1RB	High	QPSK	23.01	22.89	22.98	22.96	23.03	23.26
		16QAM	21.82	21.52	21.90	21.43	21.87	21.66
	Middle	QPSK	23.16	23.06	23.35	23.13	23.16	23.19
		16QAM	21.81	21.73	21.75	21.46	21.80	21.80
	Low	QPSK	22.99	23.07	22.98	23.08	22.80	22.81
		16QAM	21.53	21.70	21.81	21.60	21.73	21.78
50%RB	High	QPSK	22.14	22.05	22.20	22.09	22.13	22.19
		16QAM	21.01	20.98	21.02	21.22	21.09	21.24
	Middle	QPSK	22.16	22.15	22.08	22.16	22.10	22.14
		16QAM	20.99	21.14	20.85	21.09	21.08	21.14
	Low	QPSK	22.06	22.06	22.08	22.10	22.12	21.98
		16QAM	21.09	21.02	21.06	21.01	21.17	20.87
100%RB	/	QPSK	22.10	22.02	22.13	22.10	22.03	22.17
		16QAM	21.12	21.01	21.19	21.14	21.02	21.05

LTE-FDD Band 17			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			23825	23790	23755	23800	23790	23780
1RB	High	QPSK	23.04	23.05	23.02	23.05	23.28	23.34
		16QAM	21.87	21.85	21.48	21.96	21.93	21.90
	Middle	QPSK	23.17	23.18	23.05	23.19	23.16	23.30
		16QAM	21.86	21.82	21.83	22.01	21.93	21.62
	Low	QPSK	23.01	22.92	23.11	23.14	23.28	23.32
		16QAM	21.75	21.53	21.56	21.82	21.89	21.79
50%RB	High	QPSK	22.28	22.14	22.13	22.26	22.16	22.15
		16QAM	21.08	21.01	20.99	21.05	21.10	21.17
	Middle	QPSK	22.23	22.24	22.13	22.27	22.21	22.26
		16QAM	21.02	21.17	21.12	21.20	21.13	21.20
	Low	QPSK	22.25	22.12	22.13	22.24	22.26	22.20
		16QAM	20.96	21.10	20.91	21.07	21.07	21.13
100%RB	/	QPSK	22.27	22.10	22.13	22.16	22.18	22.23
		16QAM	21.10	21.10	21.01	21.13	20.98	21.09

LTE-FDD Band 18			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			23975	23925	23875	23950	23925	23900
1RB	High	QPSK	22.74	22.88	23.06	23.15	23.02	23.15
		16QAM	21.38	21.22	21.50	21.76	21.75	21.82
	Middle	QPSK	22.97	23.14	23.35	23.04	23.09	23.16
		16QAM	21.74	21.78	21.63	21.86	21.97	21.95
	Low	QPSK	22.84	22.97	22.86	23.13	23.03	23.07
		16QAM	21.46	21.24	21.27	21.61	21.80	21.84
50%RB	High	QPSK	22.03	22.06	22.19	22.10	22.09	22.14
		16QAM	20.80	21.01	20.99	21.11	20.99	21.14
	Middle	QPSK	22.03	22.10	22.17	22.03	22.13	22.12
		16QAM	21.16	20.93	20.97	21.07	21.08	21.20
	Low	QPSK	22.03	22.07	22.00	22.09	22.18	22.21
		16QAM	21.00	20.99	20.78	21.11	21.12	21.09
100%RB	/	QPSK	22.13	22.09	22.22	22.07	22.06	22.15
		16QAM	20.87	21.02	21.10	21.04	21.10	21.12
RB allocation	RB offset (Start RB)	Modula-tion	15MHz					
			23925	23925	23925			
1RB	High	QPSK	22.79	23.15	23.12			
		16QAM	21.66	21.73	21.69			
	Middle	QPSK	22.87	22.95	23.12			
		16QAM	21.78	21.93	21.80			
	Low	QPSK	23.03	22.97	23.04			
		16QAM	21.76	21.69	21.68			
50%RB	High	QPSK	22.12	22.22	22.20			
		16QAM	20.99	20.99	21.00			
	Middle	QPSK	22.22	22.18	22.17			
		16QAM	21.10	21.11	21.10			
	Low	QPSK	22.08	22.24	22.04			
		16QAM	21.13	21.15	21.05			
100%RB	/	QPSK	22.14	22.15	22.23			
		16QAM	21.01	21.11	21.10			

LTE-FDD Band 19			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			24125	24075	24025	24100	24075	24050
1RB	High	QPSK	22.86	23.13	23.00	23.02	23.15	23.04
		16QAM	21.57	21.58	21.57	21.94	21.64	21.78
	Middle	QPSK	23.14	23.27	23.47	23.20	23.23	23.23
		16QAM	21.87	21.74	21.87	21.95	21.89	22.00
	Low	QPSK	22.95	23.02	22.91	23.21	23.16	23.23
		16QAM	21.44	21.52	21.53	21.57	21.85	21.71
50%RB	High	QPSK	22.04	22.10	22.14	22.11	22.19	22.27
		16QAM	20.94	20.98	21.08	21.05	20.98	21.07
	Middle	QPSK	22.12	22.12	22.17	22.26	22.18	22.18
		16QAM	20.95	21.09	21.21	21.04	21.15	21.14
	Low	QPSK	22.05	22.12	22.17	22.20	22.19	22.23
		16QAM	21.00	20.98	20.80	21.10	21.15	21.43
100%RB	/	QPSK	22.06	22.12	22.27	22.16	22.17	22.21
		16QAM	21.06	21.18	20.99	21.11	21.04	21.08
RB allocation	RB offset (Start RB)	Modula-tion	15MHz					
			24075	24075	24075			
1RB	High	QPSK	22.98	23.18	23.28			
		16QAM	21.95	21.62	21.68			
	Middle	QPSK	23.12	23.15	23.21			
		16QAM	21.68	21.62	21.61			
	Low	QPSK	23.23	23.27	23.18			
		16QAM	21.82	21.77	21.84			
50%RB	High	QPSK	22.25	22.21	22.20			
		16QAM	21.11	21.13	21.12			
	Middle	QPSK	22.20	22.25	22.17			
		16QAM	21.20	21.04	21.04			
	Low	QPSK	22.23	22.25	22.19			
		16QAM	21.07	21.07	21.08			
100%RB	/	QPSK	22.22	22.19	22.29			
		16QAM	21.15	21.16	21.15			

LTEFDD Band 25			Actual output Power (dBm)		
			High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	3MHz		
			26675	26365	26055
1RB	High	QPSK	22.74	22.49	22.42
		16QAM	21.54	21.16	21.16
	Middle	QPSK	22.56	22.53	22.43
		16QAM	21.21	21.25	21.27
	Low	QPSK	22.36	22.28	22.64
		16QAM	21.57	21.34	21.17
50%RB	High	QPSK	21.64	21.66	21.71
		16QAM	21.04	20.83	20.83
	Middle	QPSK	21.72	21.65	21.72
		16QAM	21.09	20.79	20.74
	Low	QPSK	21.75	21.69	21.66
		16QAM	20.94	20.84	20.79
100%RB	/	QPSK	21.68	21.63	21.69
		16QAM	20.95	20.67	20.64

LTEFDD Band 25			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			26665	26365	26065	26640	26365	26090
1RB	High	QPSK	22.77	22.62	22.43	22.76	22.51	22.69
		16QAM	21.44	21.02	21.02	21.74	21.41	21.88
	Middle	QPSK	22.78	22.56	22.47	22.81	22.60	22.80
		16QAM	21.68	21.26	21.29	21.74	21.45	21.51
	Low	QPSK	22.76	22.43	22.65	22.70	22.62	22.69
		16QAM	21.36	21.20	20.95	21.60	21.42	21.56
50%RB	High	QPSK	21.95	21.60	21.75	21.92	21.59	21.71
		16QAM	20.90	20.42	20.44	21.17	20.58	20.66
	Middle	QPSK	21.94	21.67	21.70	21.93	21.73	21.72
		16QAM	20.77	20.58	20.58	21.00	20.81	20.79
	Low	QPSK	21.75	21.67	21.71	21.91	21.75	21.75
		16QAM	20.72	20.67	20.56	21.06	20.71	20.70
100%RB	/	QPSK	21.93	21.65	21.74	21.94	21.58	21.77
		16QAM	20.96	20.73	20.69	20.79	20.77	20.74
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			26615	26365	26115	26590	26365	26140
1RB	High	QPSK	23.03	22.47	22.79	22.85	22.58	22.62
		16QAM	21.76	20.92	21.40	22.30	21.25	20.85
	Middle	QPSK	22.79	22.58	22.45	22.90	22.82	22.74
		16QAM	21.52	21.29	21.39	22.07	21.59	20.94
	Low	QPSK	22.63	22.62	22.59	22.65	22.88	22.50
		16QAM	21.30	21.56	21.49	21.97	22.16	21.42
50%RB	High	QPSK	21.88	21.71	21.75	21.92	21.71	21.75
		16QAM	20.94	20.57	20.88	21.01	20.46	20.82
	Middle	QPSK	21.99	21.71	21.71	21.95	21.67	21.69
		16QAM	21.04	20.67	20.73	20.95	20.78	20.76
	Low	QPSK	21.78	21.83	21.68	21.71	21.81	21.76
		16QAM	20.83	20.80	20.72	20.80	20.81	20.66
100%RB	/	QPSK	21.91	21.66	21.78	21.88	21.72	21.80
		16QAM	21.09	20.57	20.83	21.26	20.72	20.77

LTE-FDD Band 26			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	1.4MHz			3MHz		
			27033	26865	26697	27025	26865	26075
1RB	High	QPSK	22.43	22.72	22.69	22.61	22.70	22.68
		16QAM	21.41	21.25	21.42	21.25	20.99	20.98
	Middle	QPSK	22.71	22.63	22.82	22.72	22.75	22.98
		16QAM	21.73	21.44	21.52	21.42	21.36	21.31
	Low	QPSK	22.70	22.72	22.82	22.58	22.74	22.71
		16QAM	21.20	21.22	21.17	21.16	21.06	20.92
50%RB	High	QPSK	22.88	22.82	22.94	21.68	21.70	21.80
		16QAM	21.55	21.58	21.53	20.76	20.74	20.91
	Middle	QPSK	23.15	22.88	22.82	21.76	21.70	21.71
		16QAM	21.73	21.57	21.57	20.76	20.82	20.83
	Low	QPSK	23.03	22.91	22.97	21.72	21.71	21.68
		16QAM	21.68	21.54	21.62	20.79	20.72	20.78
100%RB	/	QPSK	21.77	21.59	21.63	21.66	21.67	21.69
		16QAM	20.52	20.64	20.75	20.63	20.67	20.74
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			27015	26865	26715	26690	26865	26750
1RB	High	QPSK	22.56	22.63	22.30	22.55	22.52	22.65
		16QAM	21.04	20.72	20.99	21.38	21.25	21.14
	Middle	QPSK	22.81	22.88	22.83	22.71	22.58	22.66
		16QAM	21.31	20.96	21.29	21.39	21.35	21.04
	Low	QPSK	22.65	22.54	22.48	22.58	22.70	22.77
		16QAM	21.37	20.99	21.16	21.34	21.23	21.32
50%RB	High	QPSK	21.70	21.32	21.39	21.48	21.63	21.52
		16QAM	20.47	20.44	20.33	20.62	20.52	20.52
	Middle	QPSK	21.75	21.34	21.51	21.65	21.58	21.53
		16QAM	20.46	20.44	20.60	20.71	20.59	20.54
	Low	QPSK	21.74	21.36	21.46	21.45	21.63	21.38
		16QAM	20.52	20.33	20.53	20.48	20.75	20.60
100%RB	/	QPSK	21.59	21.29	21.58	21.52	21.63	21.57
		16QAM	20.54	20.47	20.65	20.50	20.56	20.58

LTE-FDD Band 26			Actual output Power (dBm)		
			High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	15MHz		
			26965	26865	26775
1RB	High	QPSK	22.36	22.57	22.35
		16QAM	21.11	21.30	21.15
	Middle	QPSK	22.55	22.68	22.51
		16QAM	21.31	21.14	20.94
	Low	QPSK	22.34	22.51	22.51
		16QAM	20.76	20.90	21.29
50%RB	High	QPSK	21.53	21.52	21.44
		16QAM	20.51	20.56	20.61
	Middle	QPSK	21.52	21.59	21.44
		16QAM	20.59	20.54	20.65
	Low	QPSK	21.41	21.55	21.29
		16QAM	20.42	20.67	20.55
100%RB	/	QPSK	21.44	21.66	21.40
		16QAM	20.56	20.55	20.62

LTE-TDD Band 41			Actual output Power (dBm)					
			High	Middle	Low	High	Middle	Low
RB allocation	RB offset (Start RB)	Modula-tion	5MHz			10MHz		
			41215	40740	40265	41190	40740	40290
1RB	High	QPSK	23.02	22.45	22.85	23.04	22.49	22.88
		16QAM	21.54	21.99	21.90	21.57	22.01	21.93
	Middle	QPSK	23.04	22.79	23.09	23.07	22.84	23.13
		16QAM	21.95	22.21	22.04	21.98	22.25	22.07
	Low	QPSK	22.80	22.57	23.13	22.82	22.58	23.16
		16QAM	21.31	22.08	22.18	21.33	22.11	22.20
50%RB	High	QPSK	21.98	21.85	21.82	22.00	21.89	21.87
		16QAM	20.87	20.93	20.74	20.88	21.00	20.86
	Middle	QPSK	21.93	21.78	21.89	21.96	21.83	21.93
		16QAM	20.86	20.82	20.88	20.88	20.86	20.91
	Low	QPSK	21.86	21.83	21.93	21.89	21.88	21.97
		16QAM	20.85	20.95	20.82	20.90	20.98	20.78
100%RB	/	QPSK	21.84	21.85	21.84	21.92	21.87	21.88
		16QAM	20.85	20.89	20.80	20.88	20.94	20.84
RB allocation	RB offset (Start RB)	Modula-tion	15MHz			20MHz		
			41165	40740	40315	41140	40740	40340
1RB	High	QPSK	23.01	22.44	22.84	22.99	22.43	22.81
		16QAM	21.54	21.97	21.90	21.52	21.94	21.88
	Middle	QPSK	23.05	22.83	23.10	23.04	23.10	23.08
		16QAM	21.96	22.22	22.05	21.92	22.20	22.01
	Low	QPSK	22.81	22.54	23.14	22.78	22.50	23.01
		16QAM	21.28	22.09	22.18	21.26	22.05	22.13
50%RB	High	QPSK	21.97	21.86	21.83	21.84	21.81	21.79
		16QAM	20.88	20.94	20.75	20.85	20.89	20.71
	Middle	QPSK	21.93	21.78	21.89	21.91	21.94	21.86
		16QAM	20.85	20.81	20.87	20.82	20.79	20.84
	Low	QPSK	21.87	21.84	21.94	21.84	21.79	21.90
		16QAM	20.85	20.98	20.83	20.82	20.94	20.80
100%RB	/	QPSK	21.90	21.83	21.83	21.87	21.78	21.79
		16QAM	20.85	20.89	20.80	20.83	20.85	20.77

12.5. CDMA Measurement result

General Note:

1. Per KDB 941225 D01v03r01, the data device SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps). If 1xRTT power is less than 1/4dB higher than Re v0, SAR tests with those settings are not necessary.
2. Per KDB 941225 D01 v03r01, Head SAR for RC1+SO55 is not required because the maximum average output power of RC1 is less than 1/4 dB higher than RC3+SO55.
3. Per KDB 941225 D01 v03r01 , in Hotspot mode EUT is tested as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps). If 1xRTT power is less than 1/4dB higher than Rev 0, SAR tests with those settings are not necessary.

Table 12.16: The conducted power for CDMA

Band	CDMA2000 BC0			CDMA2000 BC1		
Channel	1013	384	777	25	600	1175
Frequency (MHz)	824.7	836.52	848.31	1851.25	1880.00	1908.75
1xRTT RC1 SO55	23.98	24.06	24.1	23.33	23.37	23.41
1xRTT RC3 SO55	24.01	24.1	24.11	23.35	23.42	23.5
1xRTT RC3 SO32(+ F-SCH)	23.88	23.92	23.98	23.36	23.39	23.37
1xRTT RC3 SO32(+SCH)	23.97	23.99	24.03	23.23	23.29	23.39
1xEVDO RTAP 153.6Kbps	23.94	23.95	23.98	23.21	23.26	23.27
1xEVDO RTAP 4096Kbps	23.08	23.11	23.14	22.35	22.37	22.39

12.6. WiFi and BT Measurement result

Table 12.17: The conducted power for Bluetooth

GFSK			
Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	8.91	9.44	9.45
π/4 DQPSK			
Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	7.17	7.74	7.74
8DPSK			
Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	7.17	7.16	7.67

Table 12.18: The conducted power for BLE

GFSK			
Channel	Ch0 (2402 MHz)	Ch19 (2440MHz)	CH39 (2480MHz)
Conducted Output Power (dBm)	-0.711	-0.261	-0.207

NOTE: According to KDB447498 D01 BT standalone SAR are not required, because maximum average output power is less than 10mW.

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

SAR head value of BT is 0.374 W/Kg for 1g. SAR body value of BT is 0.187 W/Kg for 1g.

The default power measurement procedures are:

a) Power must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band.

b) Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.

1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.

2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

c) For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured.

During WLAN SAR testing EUT is configured with the WLAN continuous TX tool, and the transmission duty factor was monitored on the spectrum analyzer with zero-span setting, the duty cycle is 100%.

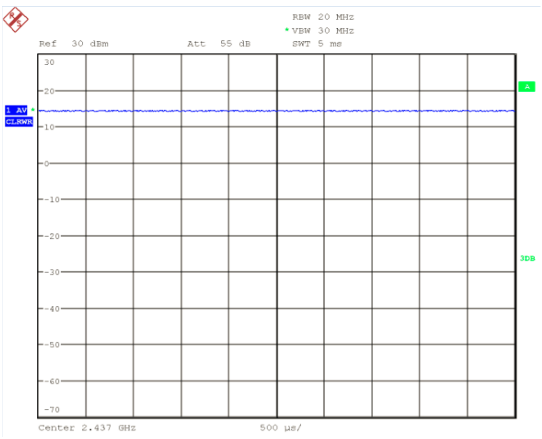
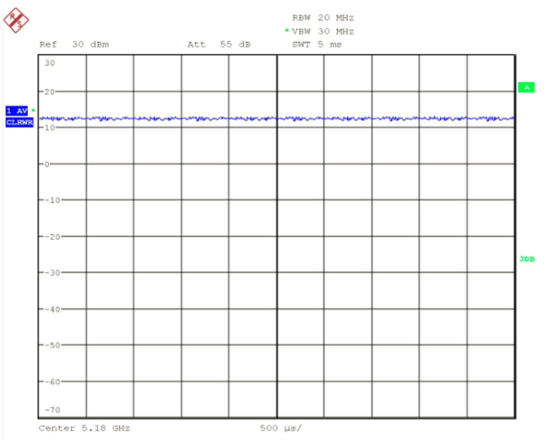
802.11b	802.11a
	

Table 12.19: The average conducted power for WiFi

Mode	Channel	Frequency	Average power(dBm)
802.11 b	1	2412 MHZ	19.03
	6	2437 MHZ	19.06
	11	2462 MHZ	19.63
802.11 g	1	2412 MHZ	15.60
	6	2437 MHZ	16.39
	11	2462 MHZ	16.72
802.11 n 20M	1	2412 MHZ	13.93
	6	2437 MHZ	14.19
	11	2462 MHZ	14.60
802.11 n 40M	3	2422 MHZ	14.97
	6	2437 MHZ	14.59
	9	2452 MHZ	15.15

Mode	Channel	Frequence MHz	Average Power (dBm)
802.11a	36	5180	12.54
	40	5200	11.67
	44	5220	11.06
	48	5240	9.69
	52	5260	9.08
	56	5280	10.37
	60	5300	9.86
	64	5320	10.49
	100	5500	11.37
	104	5520	10.87
	108	5540	10.38
	112	5560	9.8
	116	5580	9.45
	132	5660	9.09
	136	5680	8.84
	140	5700	9.12
	149	5745	12.54
	153	5765	11.67
	157	5785	11.06
	161	5805	9.69
	165	5825	9.08
802.11n 20M	36	5180	11.46
	40	5200	10.56
	44	5220	9.99
	48	5240	8.42
	52	5260	9.64
	56	5280	9.16
	60	5300	8.58
	64	5320	10.49
	100	5500	9.75
	104	5520	9.19
	108	5540	8.67
	112	5560	8.1
	116	5580	7.75
	132	5660	7.09
	136	5680	6.91
	140	5700	7.41
	149	5745	9.8

	153	5765	10.03
	157	5785	9.97
	161	5805	11.9
	165	5825	11.84
802.11n 40M	38	5190	10.94
	46	5230	8.3
	54	5270	8.77
	62	5310	8.28
	102	5510	8.7
	110	5550	7.49
	134	5670	6.56
	151	5755	10.02
	159	5795	10.17

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.

a) When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.

b) When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

5GHz 802.11a/n OFDM SAR Test Exclusion Requirements

For devices that operate in both U-NII-1 and U-NII-2A bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.

2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.

The highest reported SAR for Main Antenna is adjusted by the ratio of U-NII-1 to U-NII-2A specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg . So WiFi Antenna U-NII-2A mode is not required.

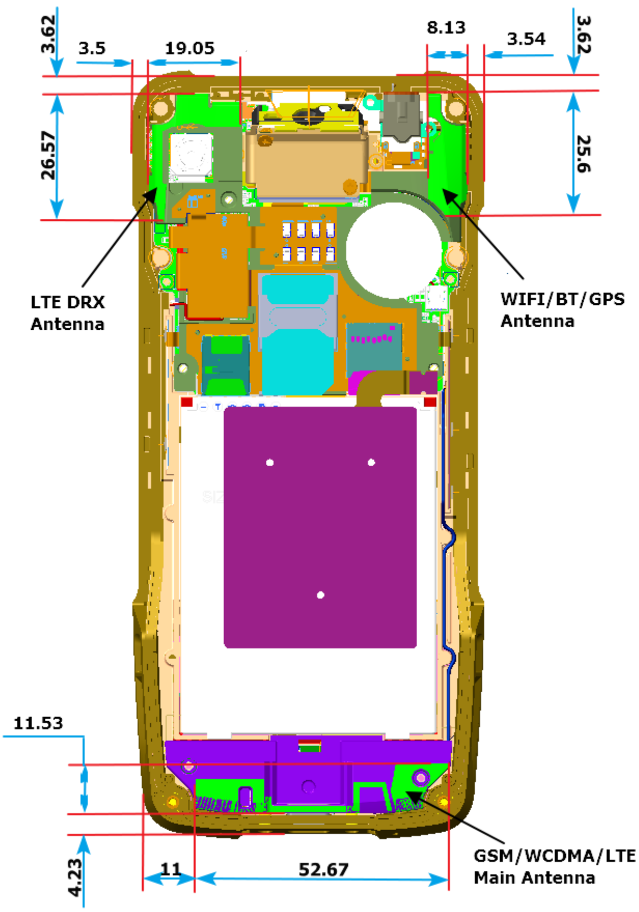
13. Simultaneous TX SAR Considerations

13.1. Introduction

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

For this device, the BT and WiFi can transmit simultaneous with other transmitters.

13.2. Transmit Antenna Separation Distances



Picture 12.1 Antenna Locations

13.3. Standalone SAR Test Exclusion Considerations

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

The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·

[√f(GHz)] ≤ 3.0 for 1-g SAR, where

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

According to the KDB447498 appendix A, the SAR test exclusion threshold for 2450MHz at 5mm test separation distances is 10mW.

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} * \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

Based on the above equation, Bluetooth SAR was not required:

Evaluation=2.807＜3.0

13.4. SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR v01, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

SAR Measurement Positions						
Antenna Mode	Phantom	Ground	Left	Right	Top	Bottom
WWAN	Yes	Yes	Yes	Yes	No	Yes
WLAN	Yes	Yes	No	Yes	Yes	No

14. SAR Test Result

Table 14.1: SAR Values(GSM 850 MHz Band)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	GSM850	190	836.6	31.18	32	-0.010	0.058	1.21	**0.070**	**1**
Left Tilt 15°	Standard	GSM850	190	836.6	31.18	32	0.190	0.043	1.21	0.052	/
Right Touch	Standard	GSM850	190	836.6	31.18	32	-0.130	0.058	1.21	0.070	/
Right Tilt 15°	Standard	GSM850	190	836.6	31.18	32	0.180	0.042	1.21	0.051	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	GPRS 3TS	190	836.6	28.31	29	0.030	0.088	1.17	0.104	/
Back Side	Standard	GPRS 3TS	190	836.6	28.31	29	-0.070	0.338	1.17	**0.396**	**2**
Left Side	Standard	GPRS 3TS	190	836.6	28.31	29	0.160	0.179	1.17	0.210	/
Right Side	Standard	GPRS 3TS	190	836.6	28.31	29	0.120	0.321	1.17	0.376	/
Bottom Side	Standard	GPRS 3TS	190	836.6	28.31	29	0.100	0.227	1.17	0.266	/

Table 14.2: SAR Values(GSM 1900 MHz Band)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	GSM1900	661	1880	28.93	30	-0.150	0.119	1.28	**0.152**	**3**
Left Tilt 15°	Standard	GSM1900	661	1880	28.93	30	0.130	0.081	1.28	0.104	/
Right Touch	Standard	GSM1900	661	1880	28.93	30	0.170	0.081	1.28	0.103	/
Right Tilt 15°	Standard	GSM1900	661	1880	28.93	30	0.040	0.053	1.28	0.068	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	GPRS 2TS	661	1880	26.56	27.5	0.130	0.092	1.24	0.114	/
Back Side	Standard	GPRS 2TS	661	1880	26.56	27.5	0.160	0.314	1.24	**0.390**	**4**
Left Side	Standard	GPRS 2TS	661	1880	26.56	27.5	0.130	0.186	1.24	0.231	/
Right Side	Standard	GPRS 2TS	661	1880	26.56	27.5	0.120	0.041	1.24	0.051	/
Bottom Side	Standard	GPRS 2TS	661	1880	26.56	27.5	-0.140	0.215	1.24	0.267	/

Table 14.3: SAR Values(WCDMA Band II)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	RMC12.2k	9400	1880	23.57	24	0.170	0.200	1.10	**0.221**	**5**
Left Tilt 15°	Standard	RMC12.2k	9400	1880	23.57	24	0.100	0.137	1.10	0.151	/
Right Touch	Standard	RMC12.2k	9400	1880	23.57	24	0.180	0.124	1.10	0.137	/
Right Tilt 15°	Standard	RMC12.2k	9400	1880	23.57	24	0.100	0.123	1.10	0.136	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	RMC12.2k	9400	1880	23.57	24	0.160	0.164	1.10	0.181	/
Back Side	Standard	RMC12.2k	9400	1880	23.57	24	0.180	0.467	1.10	**0.516**	**6**
Left Side	Standard	RMC12.2k	9400	1880	23.57	24	0.180	0.309	1.10	0.341	/
Right Side	Standard	RMC12.2k	9400	1880	23.57	24	0.140	0.078	1.10	0.086	/
Bottom Side	Standard	RMC12.2k	9400	1880	23.57	24	0.160	0.432	1.10	0.477	/

Table 14.4: SAR Values(WCDMA Band IV)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	RMC12.2k	1413	1732.6	23.37	24	0.120	0.149	1.16	**0.172**	**7**
Left Tilt 15°	Standard	RMC12.2k	1413	1732.6	23.37	24	0.150	0.111	1.16	0.128	/
Right Touch	Standard	RMC12.2k	1413	1732.6	23.37	24	0.150	0.130	1.16	0.150	/
Right Tilt 15°	Standard	RMC12.2k	1413	1732.6	23.37	24	0.100	0.095	1.16	0.110	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	RMC12.2k	1413	1732.6	23.37	24	0.130	0.143	1.16	0.165	/
Back Side	Standard	RMC12.2k	1413	1732.6	23.37	24	0.180	0.325	1.16	0.376	/
Left Side	Standard	RMC12.2k	1413	1732.6	23.37	24	0.110	0.233	1.16	0.269	/
Right Side	Standard	RMC12.2k	1413	1732.6	23.37	24	0.080	0.145	1.16	0.168	/
Bottom Side	Standard	RMC12.2k	1413	1732.6	23.37	24	-0.180	0.328	1.16	**0.379**	**8**

Table 14.5: SAR Values (WCDMA Band V)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	RMC12.2k	4183	836.6	23.23	24	0.130	0.134	1.19	0.160	/
Left Tilt 15°	Standard	RMC12.2k	4183	836.6	23.23	24	0.050	0.077	1.19	0.092	/
Right Touch	Standard	RMC12.2k	4183	836.6	23.23	24	-0.150	0.137	1.19	**0.164**	**9**
Right Tilt 15°	Standard	RMC12.2k	4183	836.6	23.23	24	0.090	0.052	1.19	0.062	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	RMC12.2k	4183	836.6	23.23	24	0.170	0.105	1.19	0.125	/
Back Side	Standard	RMC12.2k	4183	836.6	23.23	24	0.160	0.437	1.19	**0.522**	**10**
Left Side	Standard	RMC12.2k	4183	836.6	23.23	24	0.090	0.074	1.19	0.088	/
Right Side	Standard	RMC12.2k	4183	836.6	23.23	24	0.050	0.150	1.19	0.179	/
Bottom Side	Standard	RMC12.2k	4183	836.6	23.23	24	-0.190	0.139	1.19	0.166	/

Table 14.6: SAR Values (LTE Band 4)

Test Position	Cover Type	Mode				Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
		Modulation	BW(MHz)	RB Allocation	RB Offset						Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR														
Left Touch	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.150	0.124	1.08	0.134	/
Left Tilt 15°	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.120	0.129	1.08	**0.139**	/
Right Touch	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.170	0.100	1.08	0.108	/
Right Tilt 15°	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.120	0.092	1.08	0.099	/
Left Touch	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	0.130	0.099	1.42	**0.140**	**11**
Left Tilt 15°	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	0.100	0.099	1.42	0.140	/
Right Touch	Standard	QPSK	20	50%	mid	20175	1732.5	21.98	23.5	0.120	0.081	1.42	0.114	/
Right Tilt 15°	Standard	QPSK	20	50%	mid	20175	1732.5	21.98	23.5	0.110	0.068	1.42	0.096	/
Body SAR (HotSpot 10mm)														
Front Side	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.180	0.154	1.08	0.166	/
Back Side	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.190	0.348	1.08	**0.375**	**12**
Left Side	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.110	0.257	1.08	0.277	/
Right Side	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	0.130	0.139	1.08	0.150	/
Bottom Side	Standard	QPSK	20	1	low	20175	1732.5	23.17	23.5	-0.040	0.250	1.08	0.270	/
Front Side	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	0.140	0.118	1.42	0.167	/
Back Side	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	0.140	0.265	1.42	**0.375**	/
Left Side	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	0.020	0.213	1.42	0.302	/
Right Side	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	0.190	0.108	1.42	0.153	/
Bottom Side	Standard	QPSK	20	50%	mid	20175	1732.5	21.99	23.5	-0.110	0.251	1.42	0.355	/

Table 14.7: SAR Values (LTE Band 7)

Test Position	Cover Type	Mode				Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
		Modulation	BW(MHz)	RB Allocation	RB Offset						Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR														
Left Touch	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.150	0.057	1.09	**0.062**	**13**
Left Tilt 15°	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.170	0.040	1.09	0.043	/
Right Touch	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.150	0.024	1.09	0.026	/
Right Touch	Standard	QPSK	20	1	high	21350	2560	23.63	24	-0.120	0.053	1.09	0.057	/
Left Touch	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.090	0.051	1.15	**0.059**	/
Left Tilt 15°	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.170	0.033	1.15	0.038	/
Right Touch	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.130	0.020	1.15	0.023	/
Right Tilt 15°	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.110	0.041	1.15	0.047	/
Body SAR (HotSpot 10mm)														
Front Side	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.080	0.054	1.09	0.058	/
Back Side	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.070	0.668	1.09	**0.727**	**14**
Left Side	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.150	0.119	1.09	0.130	/
Right Side	Standard	QPSK	20	1	high	21350	2560	23.63	24	0.150	0.021	1.09	0.023	/
Bottom Side	Standard	QPSK	20	1	high	21350	2560	23.63	24	-0.140	0.355	1.09	0.387	/
Front Side	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.090	0.044	1.15	0.051	/
Back Side	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.120	0.594	1.15	**0.684**	/
Left Side	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	-0.030	0.099	1.15	0.113	/
Right Side	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	0.110	0.019	1.15	0.022	/
Bottom Side	Standard	QPSK	20	50%	high	21350	2560	21.89	22.5	-0.110	0.299	1.15	0.344	/

Table 14.8: SAR Values (LTE Band 12)

Test Position	Cover Type	Mode				Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
		Modulation	BW(MHz)	RB Allocation	RB Offset						Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR														
Left Touch	Standard	QPSK	10	1	high	23060	704	23.26	24	0.130	0.066	1.19	**0.078**	/
Left Tilt 15°	Standard	QPSK	10	1	high	23060	704	23.26	24	0.110	0.025	1.19	0.029	/
Right Touch	Standard	QPSK	10	1	high	23060	704	23.26	24	0.120	0.032	1.19	0.038	/
Right Tilt 15°	Standard	QPSK	10	1	high	23060	704	23.26	24	0.110	0.018	1.19	0.021	/
Left Touch	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.100	0.053	1.52	**0.081**	**15**
Left Tilt 15°	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.150	0.021	1.52	0.032	/
Right Touch	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.110	0.025	1.52	0.038	/
Right Tilt 15°	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.150	0.018	1.52	0.027	/
Body SAR (HotSpot 10mm)														
Front Side	Standard	QPSK	10	1	high	23060	704	23.26	24	0.130	0.035	1.19	0.042	/
Back Side	Standard	QPSK	10	1	high	23060	704	23.26	24	-0.040	0.150	1.19	**0.178**	**16**
Left Side	Standard	QPSK	10	1	high	23060	704	23.26	24	0.170	0.034	1.19	0.041	/
Right Side	Standard	QPSK	10	1	high	23060	704	23.26	24	0.140	0.073	1.19	0.087	/
Bottom Side	Standard	QPSK	10	1	high	23060	704	23.26	24	0.130	0.077	1.19	0.091	/
Front Side	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.130	0.027	1.52	0.041	/
Back Side	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.125	0.072	1.52	**0.110**	/
Left Side	Standard	QPSK	10	50%	high	23060	704	22.19	24	-0.110	0.026	1.52	0.039	/
Right Side	Standard	QPSK	10	50%	high	23060	704	22.19	24	0.160	0.058	1.52	0.088	/
Bottom Side	Standard	QPSK	10	50%	high	23060	704	22.19	24	-0.150	0.060	1.52	0.091	/

Table 14.9: SAR Values (LTE Band 25)

Test Position	Cover Type	Mode				Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
		Modulation	BW(MHz)	RB Allocation	RB Offset						Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR														
Left Touch	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.180	0.259	1.15	**0.297**	17
Left Tilt 15°	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	-0.180	0.117	1.15	0.134	/
Right Touch	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.190	0.112	1.15	0.129	/
Right Tilt 15°	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.190	0.089	1.15	0.102	/
Left Touch	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.160	0.207	1.27	**0.264**	/
Left Tilt 15°	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.140	0.094	1.27	0.120	/
Right Touch	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.130	0.087	1.27	0.111	/
Right Tilt 15°	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.120	0.071	1.27	0.090	/
Body SAR (HotSpot 10mm)														
Front Side	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.080	0.165	1.15	0.189	/
Back Side	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.150	0.526	1.15	**0.604**	18
Left Side	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.190	0.310	1.15	0.356	/
Right Side	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.120	0.079	1.15	0.091	/
Bottom Side	Standard	QPSK	20	1	mid	26590	1905	22.9	23.5	0.130	0.440	1.15	0.505	/
Front Side	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.160	0.132	1.27	0.168	/
Back Side	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.130	0.425	1.27	**0.541**	/
Left Side	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.120	0.252	1.27	0.321	/
Right Side	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.170	0.063	1.27	0.080	/
Bottom Side	Standard	QPSK	20	50%	mid	26590	1905	21.95	23	0.130	0.361	1.27	0.460	/

Table 14.10: SAR Values (LTE Band 26)

Test Position	Cover Type	Mode				Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
		Modulation	BW(MHz)	RB Allocation	RB Offset						Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR														
Left Touch	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.170	0.108	1.21	0.130	/
Left Tilt 15°	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.140	0.082	1.21	0.099	/
Right Touch	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.180	0.134	1.21	**0.162**	19
Right Tilt 15°	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.130	0.087	1.21	0.106	/
Left Touch	Standard	QPSK	15	50%	mid	26865	831.5	21.59	23.5	0.070	0.083	1.55	0.129	/
Left Tilt 15°	Standard	QPSK	15	50%	mid	26865	831.5	21.59	23.5	0.170	0.065	1.55	0.101	/
Right Touch	Standard	QPSK	15	50%	mid	26865	831.5	21.59	23.5	-0.060	0.102	1.55	**0.158**	/
Right Tilt 15°	Standard	QPSK	15	50%	mid	26865	831.5	21.59	23.5	0.180	0.067	1.55	0.104	/
Body SAR (HotSpot 10mm)														
Front Side	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	-0.030	0.101	1.21	0.122	/
Back Side	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.050	0.213	1.21	**0.257**	20
Left Side	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.110	0.064	1.21	0.077	/
Right Side	Standard	QPSK	15	1	mid	26865	831.5	22.68	23.5	0.060	0.078	1.21	0.094	/
Bottom Side	Standard	QPSK	15	1	mid	26775	831.5	22.68	23.5	-0.130	0.119	1.21	0.144	/
Front Side	Standard	QPSK	15	50%	low	26775	831.5	21.59	23.5	-0.010	0.080	1.55	0.124	/
Back Side	Standard	QPSK	15	50%	low	26775	831.5	21.59	23.5	-0.070	0.165	1.55	**0.256**	/
Left Side	Standard	QPSK	15	50%	low	26775	831.5	21.59	23.5	-0.170	0.044	1.55	0.068	/
Right Side	Standard	QPSK	15	50%	low	26775	831.5	21.59	23.5	0.180	0.055	1.55	0.086	/
Bottom Side	Standard	QPSK	15	50%	low	26775	831.5	21.59	23.5	-0.140	0.103	1.55	0.160	/

Table 14.11: SAR Values (LTE Band 41)

Test Position	Cover Type	Mode				Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
		Modulation	BW(MHz)	RB Allocation	RB Offset						Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR														
Left Touch	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.130	0.048	1.23	**0.059**	**21**
Left Tilt 15°	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.140	0.029	1.23	0.036	/
Right Touch	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.140	0.018	1.23	0.022	/
Right Tilt 15°	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.170	0.040	1.23	0.049	/
Left Touch	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.090	0.037	1.28	**0.047**	/
Left Tilt 15°	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.190	0.023	1.28	0.030	/
Right Touch	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.130	0.014	1.28	0.018	/
Right Tilt 15°	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.140	0.030	1.28	0.038	/
Body SAR (HotSpot 10mm)														
Front Side	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.150	0.050	1.23	0.061	/
Back Side	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.160	0.642	1.23	**0.790**	**22**
Left Side	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.080	0.133	1.23	0.164	/
Right Side	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.090	0.034	1.23	0.042	/
Bottom Side	Standard	QPSK	20	1	mid	40740	2605	23.1	24	0.120	0.363	1.23	0.447	/
Front Side	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.140	0.036	1.28	0.046	/
Back Side	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.180	0.529	1.28	**0.675**	/
Left Side	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.150	0.095	1.28	0.122	/
Right Side	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.140	0.026	1.28	0.033	/
Bottom Side	Standard	QPSK	20	50%	mid	40740	2605	21.94	23	0.130	0.290	1.28	0.370	/

Table 14.12: SAR Values (CDMA BC0)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	1xRTT	384	836.52	24.1	24.5	-0.180	0.097	1.10	0.106	/
Left Tilt 15°	Standard	1xRTT	384	836.52	24.1	24.5	0.150	0.088	1.10	0.096	/
Right Touch	Standard	1xRTT	384	836.52	24.1	24.5	-0.150	0.129	1.10	**0.141**	**23**
Right Tilt 15°	Standard	1xRTT	384	836.52	24.1	24.5	0.160	0.099	1.10	0.108	/
Left Touch	Standard	1xEV-DO-0	384	836.52	23.95	24.5	0.160	0.094	1.14	0.106	/
Left Tilt 15°	Standard	1xEV-DO-0	384	836.52	23.95	24.5	0.050	0.074	1.14	0.084	/
Right Touch	Standard	1xEV-DO-0	384	836.52	23.95	24.5	-0.040	0.102	1.14	**0.116**	/
Right Tilt 15°	Standard	1xEV-DO-0	384	836.52	23.95	24.5	-0.020	0.076	1.14	0.086	/
Left Touch	Standard	1xEV-DO-A	384	836.52	23.11	24	0.120	0.093	1.23	0.115	/
Left Tilt 15°	Standard	1xEV-DO-A	384	836.52	23.11	24	0.070	0.074	1.23	0.091	/
Right Touch	Standard	1xEV-DO-A	384	836.52	23.11	24	0.150	0.102	1.23	**0.125**	/
Right Tilt 15°	Standard	1xEV-DO-A	384	836.52	23.11	24	0.190	0.100	1.23	0.123	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	1xEV-DO-0	384	836.52	23.95	24.5	0.050	0.137	1.14	0.155	/
Back Side	Standard	1xEV-DO-0	384	836.52	23.95	24.5	-0.130	0.313	1.14	**0.355**	**24**
Left Side	Standard	1xEV-DO-0	384	836.52	23.95	24.5	0.010	0.117	1.14	0.133	/
Right Side	Standard	1xEV-DO-0	384	836.52	23.95	24.5	-0.140	0.230	1.14	0.261	/
Bottom Side	Standard	1xEV-DO-0	384	836.52	23.95	24.5	0.040	0.242	1.14	0.275	/

Table 14.13: SAR Values (CDMA BC1)

Test Position	Cover Type	Mode	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
								Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR											
Left Touch	Standard	1xRTT	600	1880	23.42	24	0.140	0.170	1.14	**0.194**	/
Left Tilt 15°	Standard	1xRTT	600	1880	23.42	24	0.150	0.159	1.14	0.182	/
Right Touch	Standard	1xRTT	600	1880	23.42	24	0.150	0.147	1.14	0.168	/
Right Tilt 15°	Standard	1xRTT	600	1880	23.42	24	0.070	0.093	1.14	0.106	/
Left Touch	Standard	1xEV-DO-0	600	1880	23.26	24	0.010	0.067	1.19	0.079	/
Left Tilt 15°	Standard	1xEV-DO-0	600	1880	23.26	24	0.160	0.176	1.19	**0.209**	**25**
Right Touch	Standard	1xEV-DO-0	600	1880	23.26	24	0.180	0.164	1.19	0.194	/
Right Tilt 15°	Standard	1xEV-DO-0	600	1880	23.26	24	0.100	0.145	1.19	0.172	/
Left Touch	Standard	1xEV-DO-A	600	1880	22.37	23	0.120	0.176	1.16	**0.203**	/
Left Tilt 15°	Standard	1xEV-DO-A	600	1880	22.37	23	0.020	0.159	1.16	0.184	/
Right Touch	Standard	1xEV-DO-A	600	1880	22.37	23	0.180	0.150	1.16	0.173	/
Right Tilt 15°	Standard	1xEV-DO-A	600	1880	22.37	23	-0.010	0.104	1.16	0.120	/
Body SAR (HotSpot 10mm)											
Front Side	Standard	1xEV-DO-0	600	1880	23.26	24	0.180	0.270	1.19	0.320	/
Back Side	Standard	1xEV-DO-0	600	1880	23.26	24	0.150	0.740	1.19	0.877	/
Back Side	Standard	1xEV-DO-0	25	1851.25	23.21	24	0.090	0.608	1.20	0.729	/
Back Side	Standard	1xEV-DO-0	1175	1908.75	23.27	24	0.110	0.807	1.18	**0.955**	/
Left Side	Standard	1xEV-DO-0	600	1880	23.26	24	0.030	0.342	1.19	0.406	/
Right Side	Standard	1xEV-DO-0	600	1880	23.26	24	0.190	0.100	1.19	0.118	/
Bottom Side	Standard	1xEV-DO-0	600	1880	23.26	24	-0.120	0.531	1.19	0.630	/
Back Side	Repeated	1xEV-DO-0	1175	1908.75	23.27	24	0.150	0.823	1.18	**0.974**	**26**

Table 14.14: SAR Values (WiFi 2.4G)

Test Position	Cover Type	Mode	BW(MHz)	Duty Cycle	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
										Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR													
Left Touch	Standard	802.11b	20	1:1	11	2462	19.63	20	-0.120	0.165	1.09	0.180	/
Left Tilt 15°	Standard	802.11b	20	1:1	11	2462	19.63	20	0.130	0.189	1.09	0.206	/
Right Touch	Standard	802.11b	20	1:1	11	2462	19.63	20	0.140	0.345	1.09	**0.376**	**27**
Right Tilt 15°	Standard	802.11b	20	1:1	11	2462	19.63	20	0.150	0.324	1.09	0.353	/
Body SAR (HotSpot 10mm)													
Front Side	Standard	802.11b	20	1:1	11	2462	19.63	20	0.040	0.013	1.09	0.014	/
Back Side	Standard	802.11b	20	1:1	11	2462	19.63	20	0.120	0.069	1.09	0.075	/
Left Side	Standard	802.11b	20	1:1	11	2462	19.63	20	0.170	0.113	1.09	**0.123**	**28**
Right Side	Standard	802.11b	20	1:1	11	2462	19.63	20	0.110	0.015	1.09	0.016	/
Top Side	Standard	802.11b	20	1:1	11	2462	19.63	20	0.110	0.031	1.09	0.033	/

Table 14.15: SAR Values (WiFi 5G)

Test Position	Cover Type	Mode	BW(MHz)	Duty Cycle	Channel	Frequency (MHz)	Measured power (dBm)	Tune-up (dBm)	Power Drift (dB)	Limit of 1gSAR 1.6 W/kg (mW/g)			Figure No.
										Measured SAR1g	Scaling Factor	Report SAR1g	
Head SAR													
Left Touch	Standard	802.11a	20	1:1	36	5180	12.54	13	0.080	0.025	1.11	0.027	/
Left Tilt 15°	Standard	802.11a	20	1:1	36	5180	12.54	13	-0.110	0.026	1.11	0.029	/
Right Touch	Standard	802.11a	20	1:1	36	5180	12.54	13	0.120	0.037	1.11	0.041	/
Right Tilt 15°	Standard	802.11a	20	1:1	36	5180	12.54	13	0.130	0.043	1.11	**0.048**	/
Left Touch	Standard	802.11a	20	1:1	149	5745	12.54	13	0.170	0.040	1.11	0.045	/
Left Tilt 15°	Standard	802.11a	20	1:1	149	5745	12.54	13	0.010	0.047	1.11	0.052	/
Right Touch	Standard	802.11a	20	1:1	149	5745	12.54	13	-0.170	0.047	1.11	0.052	/
Right Tilt 15°	Standard	802.11a	20	1:1	149	5745	12.54	13	0.150	0.054	1.11	**0.060**	29
Body SAR (HotSpot 10mm)													
Front Side	Standard	802.11a	20	1:1	36	5180	12.54	13	0.090	0.014	1.11	0.016	/
Back Side	Standard	802.11a	20	1:1	36	5180	12.54	13	0.070	0.041	1.11	0.045	/
Left Side	Standard	802.11a	20	1:1	36	5180	12.54	13	0.120	0.090	1.11	0.100	/
Right Side	Standard	802.11a	20	1:1	36	5180	12.54	13	0.010	0.000	1.11	0.000	/
Top Side	Standard	802.11a	20	1:1	36	5180	12.54	13	0.010	0.115	1.11	**0.128**	30
Front Side	Standard	802.11a	20	1:1	149	5745	12.54	13	0.020	0.011	1.11	0.013	/
Back Side	Standard	802.11a	20	1:1	149	5745	12.54	13	0.020	0.042	1.11	0.046	/
Left Side	Standard	802.11a	20	1:1	149	5745	12.54	13	-0.150	0.112	1.11	**0.125**	/
Right Side	Standard	802.11a	20	1:1	149	5745	12.54	13	0.010	0.000	1.11	0.000	/
Top Side	Standard	802.11a	20	1:1	149	5745	12.54	13	0.010	0.087	1.11	0.096	/

15. Simultaneous TX SAR Considerations

Table15.1 Simultaneous transmission SAR

Standalone SAR for 2G(W/Kg)					
Test Position			GSM 850	GSM 1900	Highest SAR
Head	Left	Cheek	0.070	0.152	0.152
		Tilt 15°	0.052	0.104	0.104
	Right	Cheek	0.070	0.103	0.103
		Tilt 15°	0.051	0.068	0.068
Hotspot &Body- worn 10 mm	Phantom Side		0.104	0.114	0.114
	Ground Side		0.396	0.390	0.396
Hotspot 10 mm	Left Side		0.210	0.231	0.231
	Right Side		0.376	0.051	0.376
	Top Side		--	--	--
	Bottom Side		0.266	0.267	0.267

Standalone SAR for 3G(W/Kg)						
Test Position			WCDMA Band II	WCDMA Band IV	WCDMA BandV	Highest SAR
Head	Left	Cheek	0.221	0.172	0.160	0.221
		Tilt 15°	0.151	0.128	0.092	0.151
	Right	Cheek	0.137	0.150	0.164	0.164
		Tilt 15°	0.136	0.110	0.062	0.136
Hotspot &Body- worn 10 mm	Phantom Side		0.181	0.165	0.125	0.181
	Ground Side		0.516	0.376	0.522	0.522
Hotspot 10 mm	Left Side		0.341	0.269	0.088	0.341
	Right Side		0.086	0.168	0.179	0.168
	Top Side		--	--	--	--
	Bottom Side		0.477	0.379	0.166	0.477

Standalone SAR for 4G (W/Kg)									
Test Position			LTE Band 4	LTE Band 7	LTE Band 12	LTE Band 25	LTE Band 26	LTE Band 41	Highest SAR
Head	Left	Cheek	0.140	0.062	0.081	0.297	0.130	0.059	0.297
		Tilt 15°	0.140	0.043	0.032	0.134	0.101	0.036	0.140
	Right	Cheek	0.114	0.026	0.038	0.129	0.162	0.022	0.162
		Tilt 15°	0.099	0.057	0.027	0.102	0.106	0.049	0.106
Hotspot &Body-worn 10 mm	Phantom Side		0.167	0.058	0.042	0.189	0.124	0.061	0.189
	Ground Side		0.375	0.727	0.178	0.604	0.257	0.790	0.790
Hotspot 10 mm	Left Side		0.302	0.130	0.041	0.356	0.077	0.164	0.356
	Right Side		0.153	0.023	0.088	0.091	0.094	0.042	0.153
	Top Side		--	--	--	--	--	--	--
	Bottom Side		0.355	0.387	0.091	0.505	0.160	0.447	0.505

Standalone SAR for CDMA(W/Kg)					
Test Position			CDMA BC0	CDMA BC1	Highest SAR
Head	Left	Cheek	0.115	0.203	0.203
		Tilt 15°	0.096	0.209	0.209
	Right	Cheek	0.141	0.194	0.194
		Tilt 15°	0.123	0.172	0.172
Hotspot &Body- worn 10 mm	Phantom Side		0.155	0.320	0.320
	Ground Side		0.355	0.974	0.974
Hotspot 10 mm	Left Side		0.133	0.406	0.406
	Right Side		0.261	0.118	0.261
	Top Side		--	--	--
	Bottom Side		0.275	0.630	0.630

Test Position			2G	3G	4G	CDMA	2.4GHz		5GHz	SUM	
							BT	WiFi	WiFi	2.4GHz	5GHz
Head(1g)	Left	Cheek	0.152	0.221	0.297	0.203	0.374	0.180	0.045	0.671	0.342
		Tilt 15°	0.104	0.151	0.140	0.209	0.374	0.206	0.052	**0.583**	0.261
	Right	Cheek	0.103	0.164	0.162	0.194	0.374	0.376	0.052	0.57	0.246
		Tilt 15°	0.068	0.136	0.106	0.172	0.374	0.353	0.060	0.546	0.232
Hotspot &Body- worn 10 mm(1g)	Phantom Side		0.114	0.181	0.189	0.320	0.187	0.014	0.016	0.507	0.336
	Ground Side		0.396	0.522	0.790	0.974	0.187	0.075	0.046	**1.161**	1.02
Hotspot 10 mm(1g)	Left Side		0.231	0.341	0.356	0.406	0.187	0.123	0.125	0.593	0.531
	Right Side		0.376	0.168	0.153	0.261	0.187	0.016	0.011	0.563	0.387
	Top Side		--	--	--	--	0.187	0.033	0.128	0.187	0.128
	Bottom Side		0.267	0.477	0.505	0.630	0.187	--	--	0.817	0.63

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

16. SAR Measurement Variability

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

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

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.

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

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45W/kg (~ 10% from the 1-g SAR limit).

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

Table 16.1: SAR Measurement Variability for Body Value (1g)

Frequency		Configuration	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio
MHz	Ch.					
1880	600	1xEV-DO-0	Back	0.807	0.823	1.020

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

17. Test Equipments Utilized

Table 17.1: SAR Test System

Item	Instrument Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Network analyzer	N5242A	MY51221755	Agilent	2018-12-17	1 year
2	Power meter	NRVD	102257	RS	2019-5-10	1 year
3	Power sensor	NRV-Z5	100241			
			100644			
4	Signal Generator	E4438C	MY49072044	Agilent	2019-5-10	1 Year
5	Amplifier	NTWPA-0086010F	12023024	rflight	No Calibration Requested	
6	Coupler	778D	MY4825551	Agilent	2019-5-10	1 year
7	BTS	E5515C	MY50266468	Agilent	2018-12-17	1 year
		MT8820C	6201240338	Anritsu	2018-12-17	1 year
8	E-field Probe	ES3DV3	3252	SPEAG	2018-9-4	1 year
		EX3DV4	7401	SPEAG	2019-1-5	1 year
9	DAE	SPEAG DAE4	1244	SPEAG	2018-12-13	1 year
10	Dipole Validation Kit	SPEAG D750V3	1144	SPEAG	2018-10-26	3 year
		SPEAG D835V2	4d112	SPEAG	2018-10-25	3 year
		SPEAG D1750V2	1044	SPEAG	2018-10-31	3 year
		SPEAG D1900V2	5d151	SPEAG	2017-12-6	3 year
		SPEAG D2450V2	858	SPEAG	2018-10-26	3 year
		SPEAG D2600V2	1031	SPEAG	2018-11-1	3 year
		SPEAG D5GHzV2	1172	SPEAG	2018-3-30	3 year

18. Measurement Uncertainty

Table18.1: Measurement uncertainty evaluation for SAR test

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

Table18.2: Measurement uncertainty evaluation for system validation

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

Table18.3: Measurement uncertainty evaluation for Fast SAR test

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

END OF REPORT BODY

ANNEX A. Graph Results

Fig.1 GSM 850 Left Cheek Middle

Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 0.934 S/m; ε_r = 42.612; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: GSM Professional 900MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
GSM 850 Left Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0598 W/kg
GSM 850 Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.527 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.0680 W/kg
SAR(1 g) = 0.058 W/kg; SAR(10 g) = 0.046 W/kg
Maximum value of SAR (measured) = 0.0601 W/kg

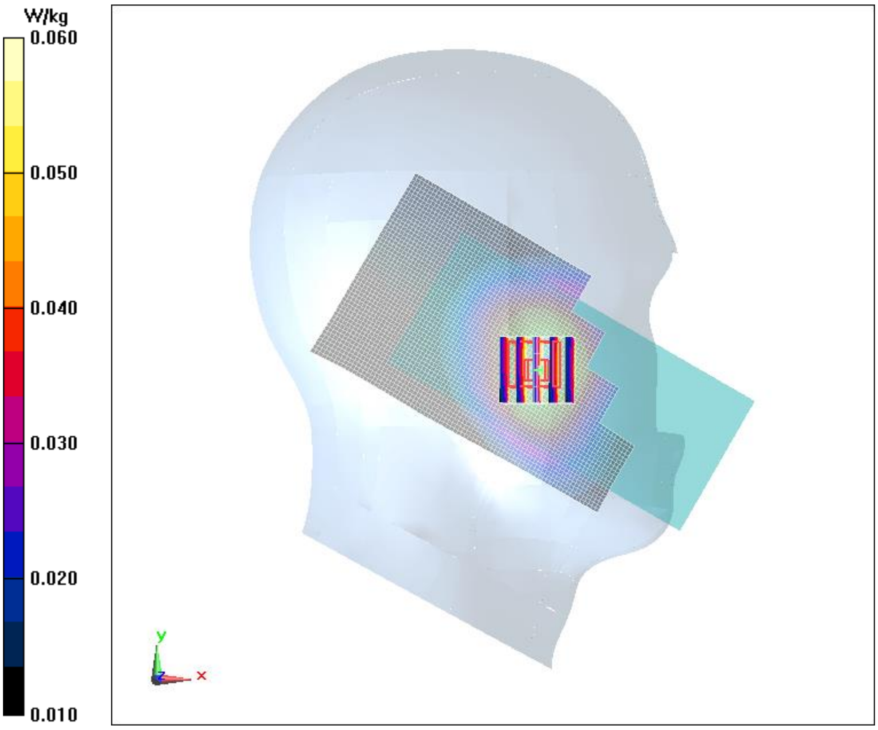


Fig.2 GSM 850 3TS Ground Mode Middle

Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 0.934 S/m; ε_r = 42.612; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: GSM 900MHz GPRS 3TS (0); Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
GSM 850 3TS Ground Mode Middle/Area Scan (61x91x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.368 W/kg
GSM 850 3TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.78 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.574 W/kg
SAR(1 g) = 0.338 W/kg; SAR(10 g) = 0.197 W/kg
Maximum value of SAR (measured) = 0.367 W/kg

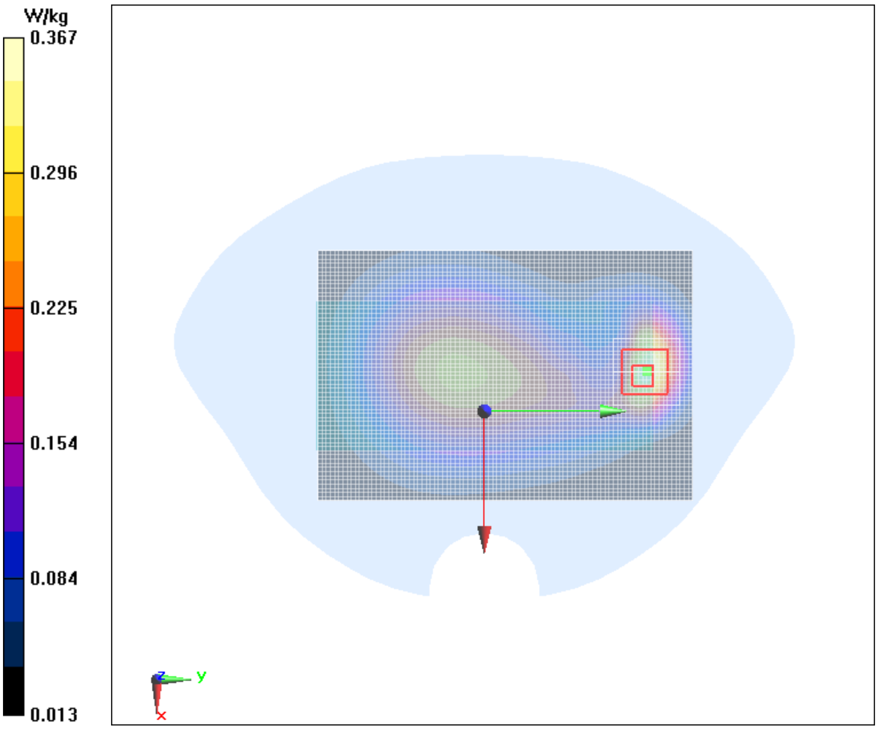


Fig.3 GSM 1900 Left Cheek Middle

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.333 S/m; ε_r = 41.918; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: GSM Professional 2000MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
GSM 1900 Left Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.151 W/kg
GSM 1900 Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.533 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.197 W/kg
SAR(1 g) = 0.119 W/kg; SAR(10 g) = 0.073 W/kg
Maximum value of SAR (measured) = 0.129 W/kg

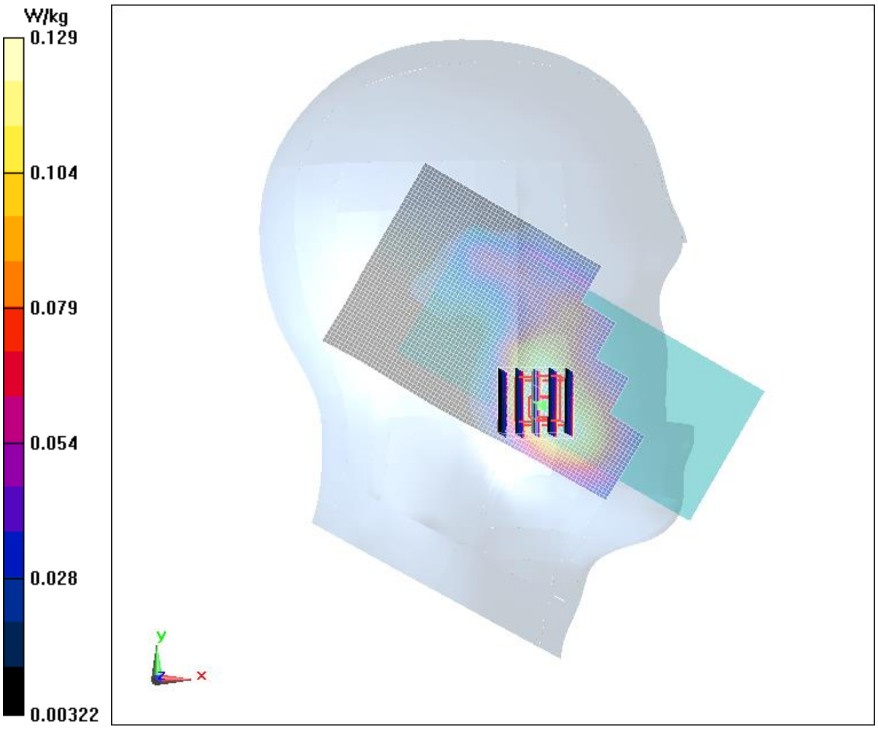


Fig.4 GPRS 1900 2TS Ground Mode Middle

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.333 S/m; ε_r = 41.918; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: GSM 2000MHz GPRS 2TS (0); Frequency: 1880 MHz; Duty Cycle: 1:4
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
GPRS 1900 2TS Ground Mode Middle/Area Scan (61x91x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.350 W/kg
GPRS 1900 2TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.213 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.540 W/kg
SAR(1 g) = 0.314 W/kg; SAR(10 g) = 0.180 W/kg
Maximum of SAR (measured) = 0.335 W/kg

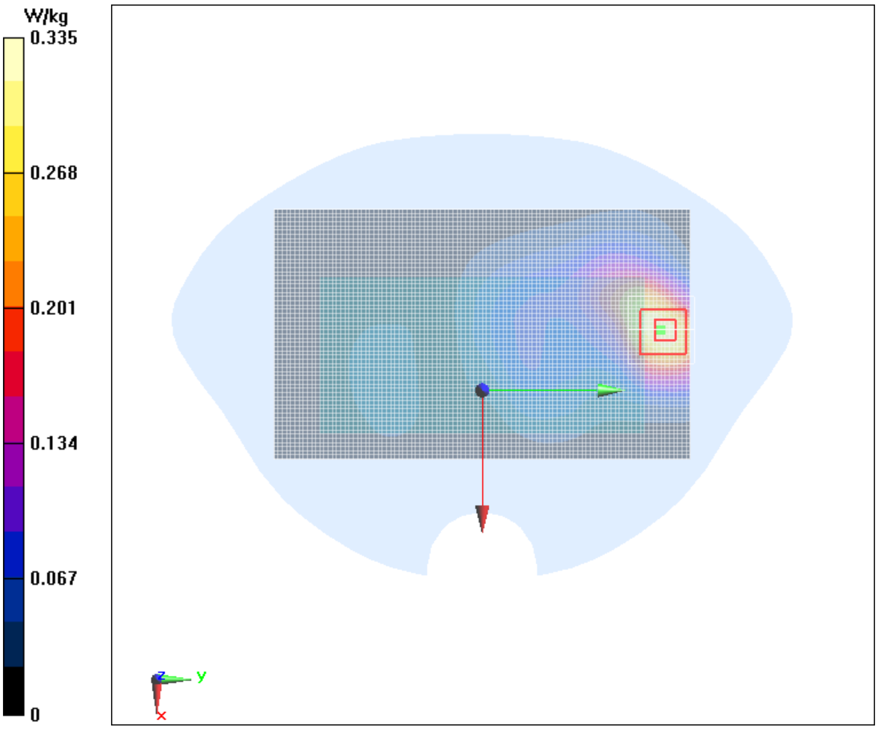


Fig.5 WCDMA B2 Left Cheek Middle

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.333 S/m; ε_r = 41.918; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: WCDMA Professional 2000MHz; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
WCDMA B2 Left Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.218 W/kg
WCDMA B2 Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.188 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.325 W/kg
SAR(1 g) = 0.200 W/kg; SAR(10 g) = 0.124 W/kg
Maximum value of SAR (measured) = 0.213 W/kg

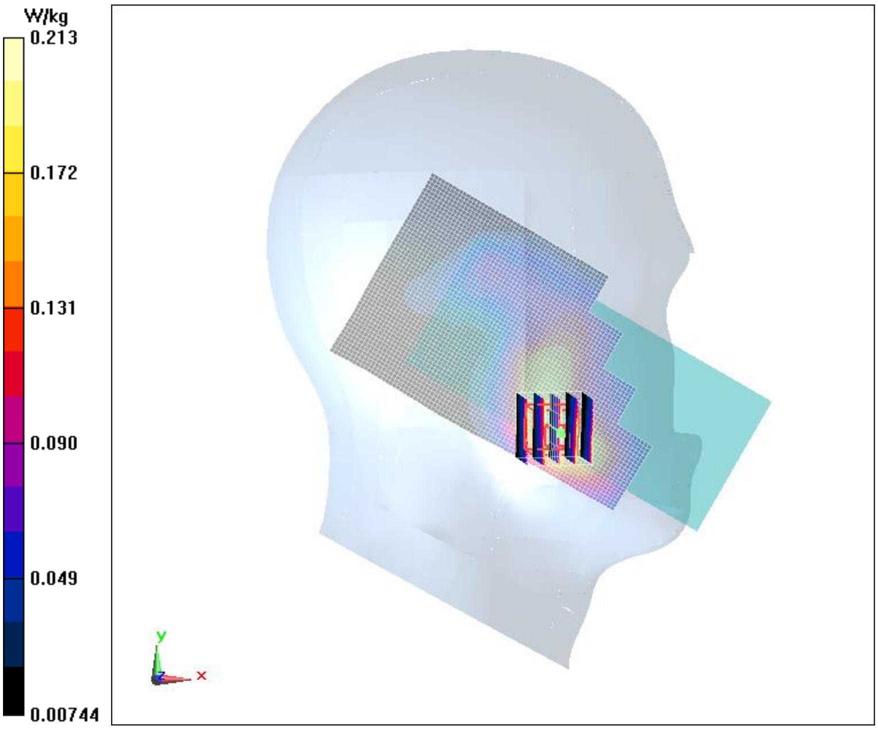


Fig.6 WCDMA B2 Ground Mode Middle

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.333 S/m; ε_r = 41.918; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: WCDMA Professional 2000MHz; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
WCDMA B2 Ground Mode Middle/Area Scan (61x91x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.531 W/kg
WCDMA B2 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.129 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.804 W/kg
SAR(1 g) = 0.467 W/kg; SAR(10 g) = 0.266 W/kg
Maximum value of SAR (measured) = 0.508 W/kg

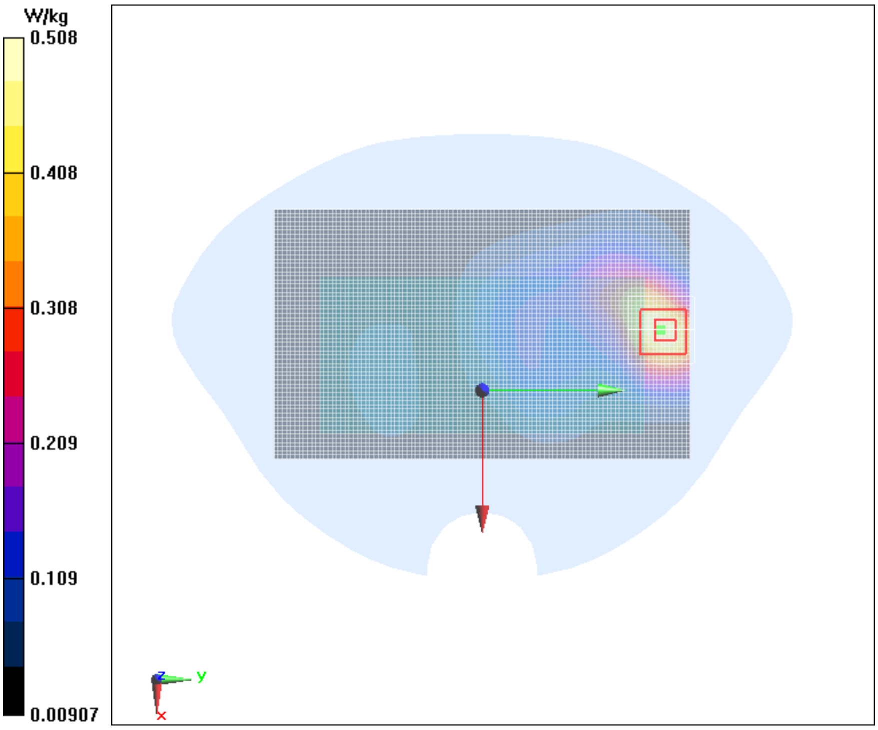


Fig.7 WCDMA B4 Left Cheek Middle

Date/Time: 2019/6/22
Electronics: DAE4 Sn1244
Medium: Head 1750MHz
Medium parameters used: f = 1733 MHz; σ = 1.301 S/m; ε_r = 40.053; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: WCDMA Professional 1750MHz; Frequency: 1732.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.39, 5.39, 5.39); Calibrated: 9/4/2018
WCDMA B4 Left Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.171 W/kg
WCDMA B4 Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.581 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.231 W/kg
SAR(1 g) = 0.149 W/kg; SAR(10 g) = 0.096 W/kg
Maximum value of SAR (measured) = 0.161 W/kg

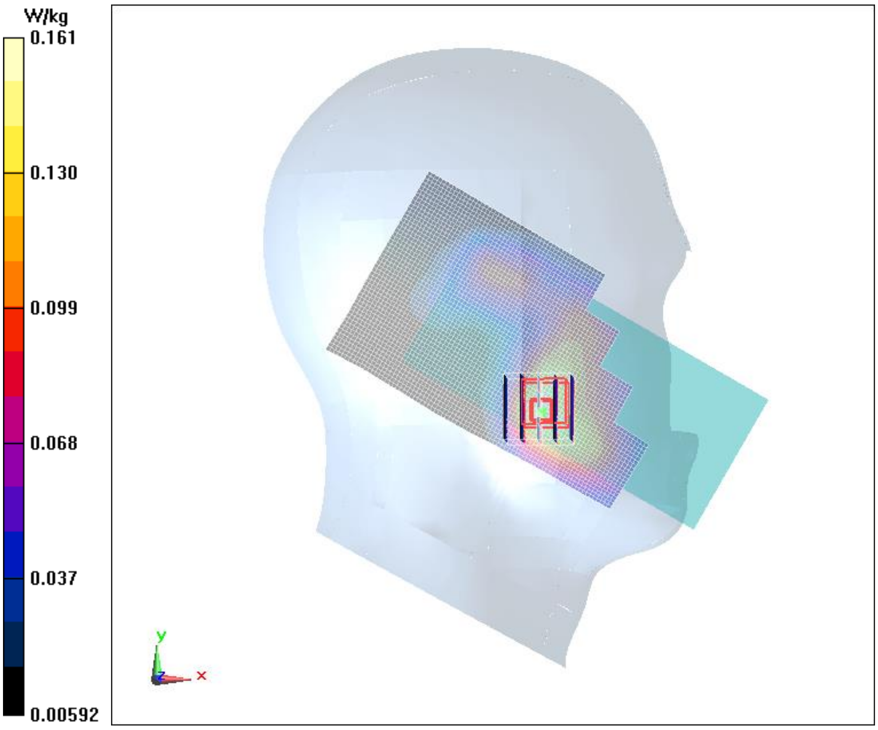


Fig.8 WCDMA B4 Bottom Mode Middle

Date/Time: 2019/6/22
Electronics: DAE4 Sn1244
Medium parameters used: f = 1733 MHz; σ = 1.301 S/m; ε_r = 40.053; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: WCDMA Professional 1750MHz; Frequency: 1732.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.39, 5.39, 5.39); Calibrated: 9/4/2018
WCDMA B4 Bottom Mode Middle/Area Scan (41x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.397 W/kg
WCDMA B4 Bottom Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.50 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.522 W/kg
SAR(1 g) = 0.328 W/kg; SAR(10 g) = 0.199 W/kg
Maximum value of SAR (measured) = 0.350 W/kg

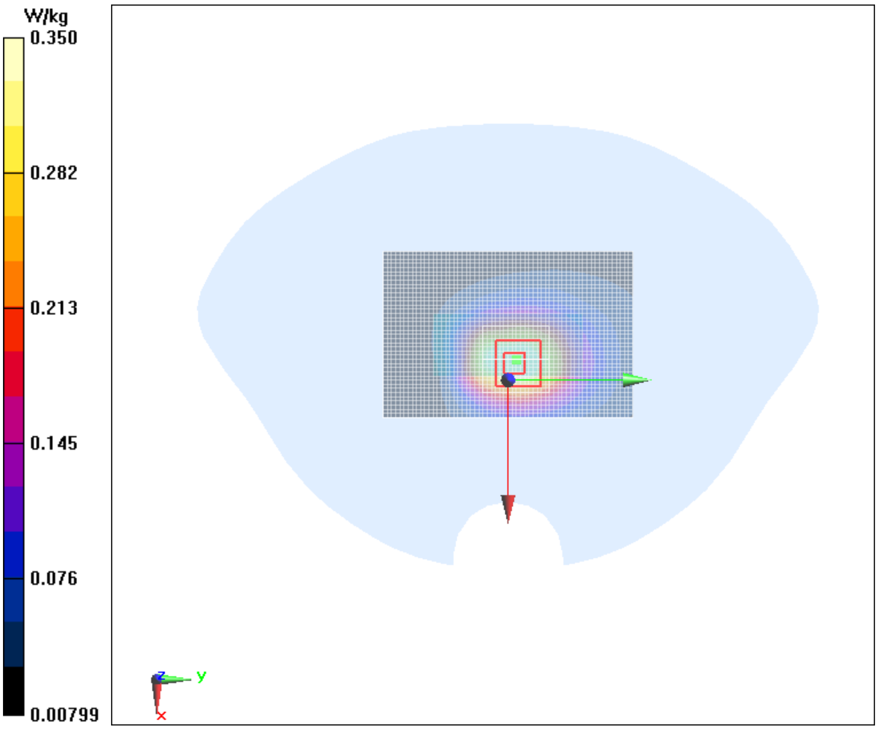


Fig.9 WCDMA B5 Right Cheek Middle

Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 0.934 S/m; ε_r = 42.612; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: WCDMA Professional Band Ⅷ; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
WCDMA B5 Right Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.146 W/kg
WCDMA B5 Right Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.675 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.167 W/kg
SAR(1 g) = 0.137 W/kg; SAR(10 g) = 0.105 W/kg
Maximum value of SAR (measured) = 0.140 W/kg

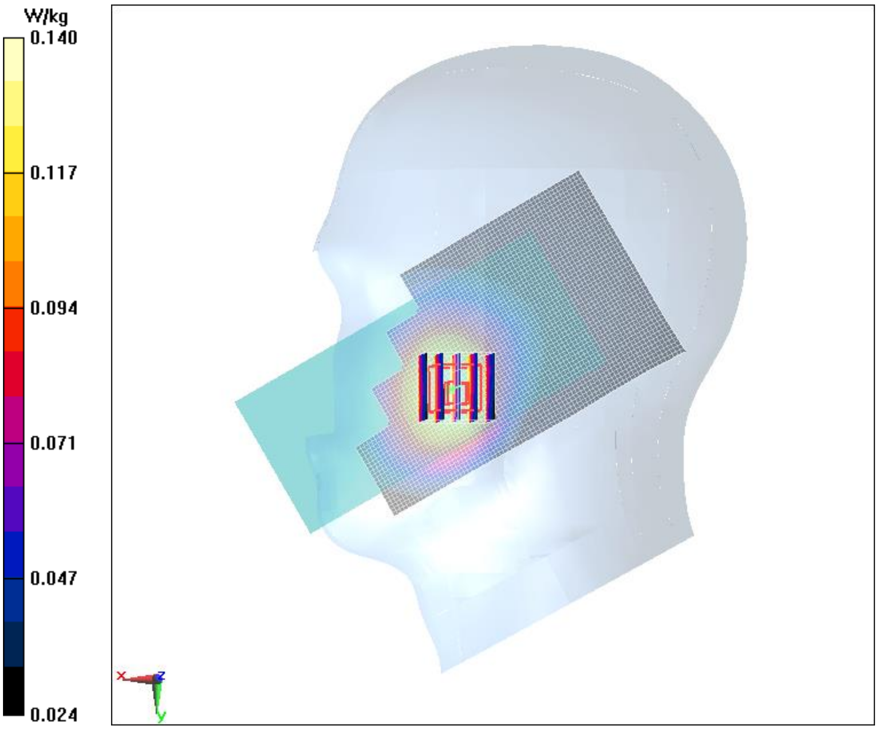


Fig.10 WCDMA B5 Ground Mode Middle

Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 0.934 S/m; ε_r = 42.612; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: WCDMA Professional Band Ⅷ; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
WCDMA B5 Ground Mode Middle/Area Scan (61x91x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.457 W/kg
WCDMA B5 Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.913 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.857 W/kg
SAR(1 g) = 0.437 W/kg; SAR(10 g) = 0.229 W/kg
Maximum value of SAR (measured) = 0.476 W/kg

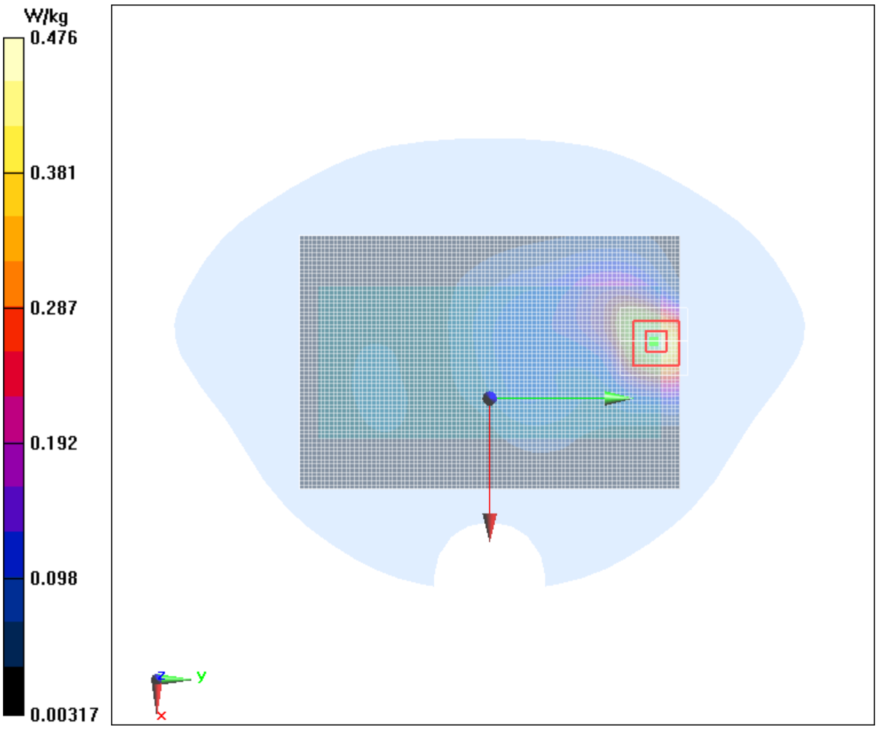


Fig.11 LTE 4 20MHz 50RB 25 Offset Left Cheek Middle

Date/Time: 2019/6/22
Electronics: DAE4 Sn1244
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.3 S/m; ε_r = 40.057; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 4 Professional 1750MHz; Frequency: 1732.5 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.39, 5.39, 5.39); Calibrated: 9/4/2018
LTE 4 20MHz 50RB 25 Offset Left Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.116 W/kg
LTE 4 20MHz 50RB 25 Offset Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.325 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.156 W/kg
SAR(1 g) = 0.099 W/kg; SAR(10 g) = 0.065 W/kg
Maximum value of SAR (measured) = 0.106 W/kg

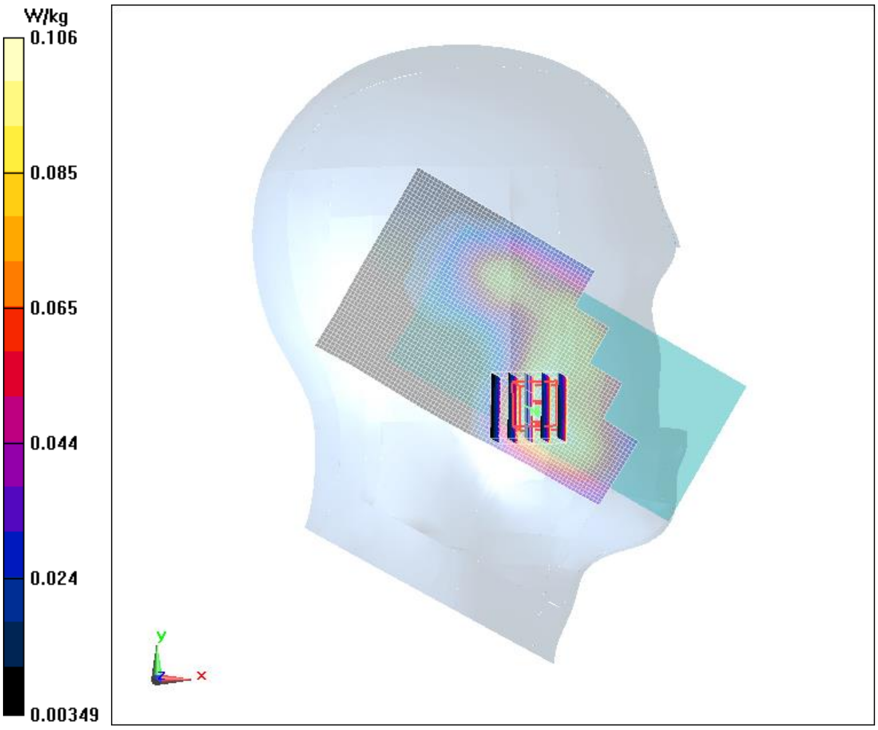


Fig.12 LTE 4 20MHz 1RB 0 Offset Ground Mode Middle

Date/Time: 2019/6/22
Electronics: DAE4 Sn1244
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.3 S/m; ε_r = 40.057; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 4 Professional 1750MHz; Frequency: 1732.5 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.39, 5.39, 5.39); Calibrated: 9/4/2018

LTE 4 20MHz 1RB 0 Offset Ground Mode Middle/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.364 W/kg

LTE 4 20MHz 1RB 0 Offset Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.483 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.540 W/kg
SAR(1 g) = 0.348 W/kg; SAR(10 g) = 0.213 W/kg
Maximum value of SAR (measured) = 0.373 W/kg

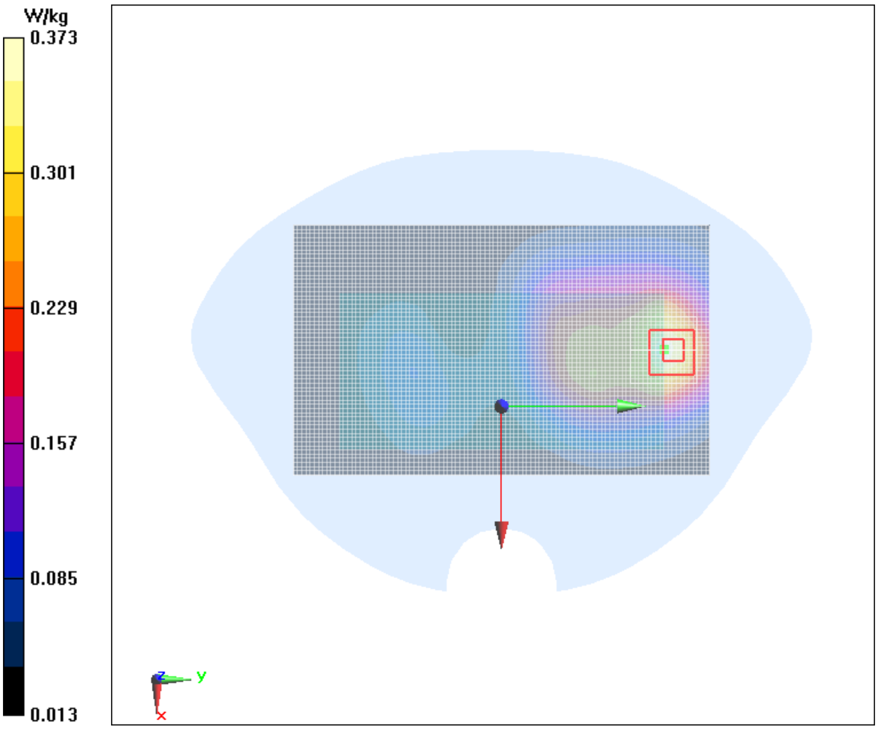


Fig.13 LTE B7 20MHz 1RB 100offset Left Cheek High

Date/Time: 2019/7/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 2560 MHz; σ = 1.897 S/m; ε_r = 39.102; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: LTE Band 7 Professional 2600MHz; Frequency: 2560 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.46, 4.46, 4.46); Calibrated: 9/4/2018
LTE B7 20MHz 1RB 100offset Left Cheek High/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0756 W/kg
LTE B7 20MHz 1RB 100offset Left Cheek High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.373 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.057 W/kg; SAR(10 g) = 0.028 W/kg
Maximum value of SAR (measured) = 0.0615 W/kg

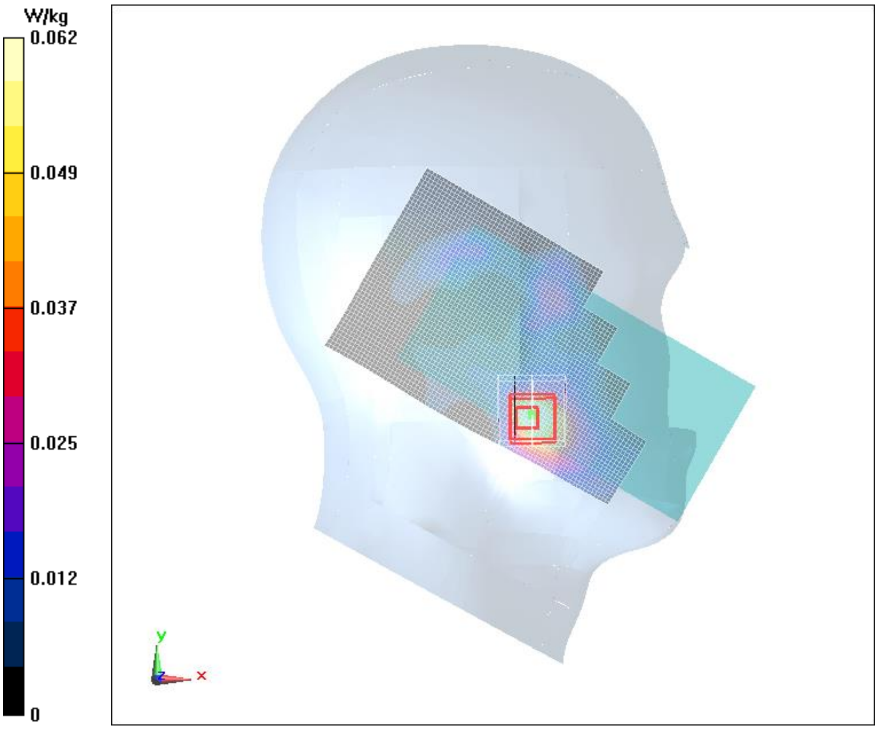


Fig.14 LTE B7 20MHz 1RB 100offset Ground Mode High

Date/Time: 2019/7/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 2560 MHz; σ = 1.897 S/m; ε_r = 39.102; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 7 Professional 2600MHz; Frequency: 2560 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.46, 4.46, 4.46); Calibrated: 9/4/2018
LTE B7 20MHz 1RB 100offset Ground Mode High/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.689 W/kg
LTE B7 20MHz 1RB 100offset Ground Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.097 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.668 W/kg; SAR(10 g) = 0.322 W/kg
Maximum value of SAR (measured) = 0.697 W/kg

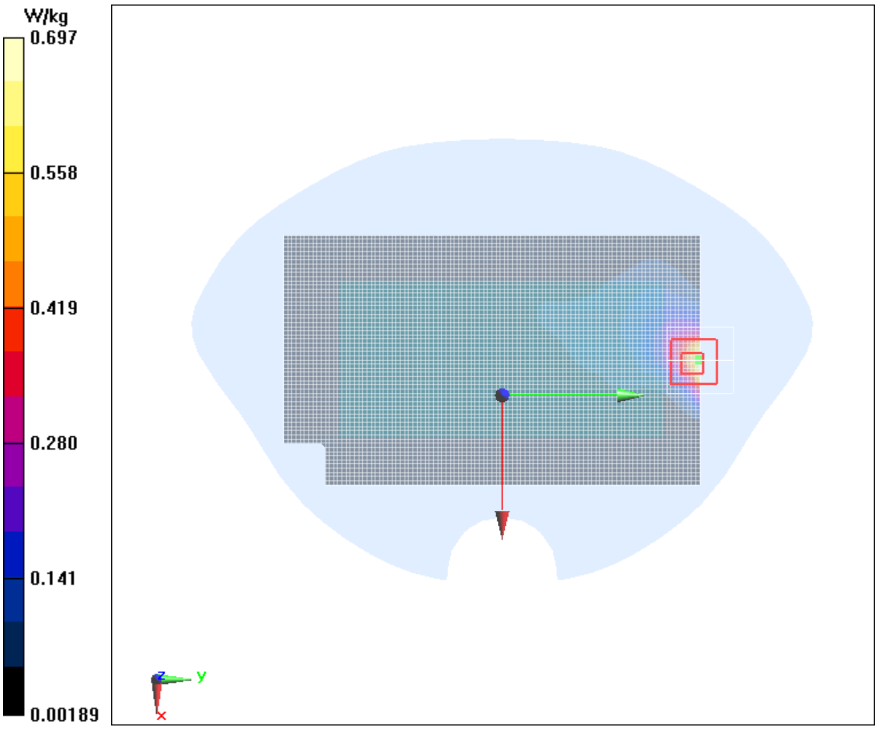


Fig.15 LTE 12 10MHz 25RB 25 Offset Left Cheek Low

Date/Time: 2019/6/20
Electronics: DAE4 Sn1244
Medium parameters used: f = 704 MHz; σ = 0.836 S/m; ε_r = 42.235; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 12 Professional 750MHz; Frequency: 704 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.51, 6.51, 6.51); Calibrated: 9/4/2018
LTE 12 10MHz 25RB 25 Offset Left Cheek Low/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0536 W/kg
LTE 12 10MHz 25RB 25 Offset Left Cheek Low/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.402 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0620 W/kg
SAR(1 g) = 0.053 W/kg; SAR(10 g) = 0.044 W/kg
Maximum value of SAR (measured) = 0.0546 W/kg

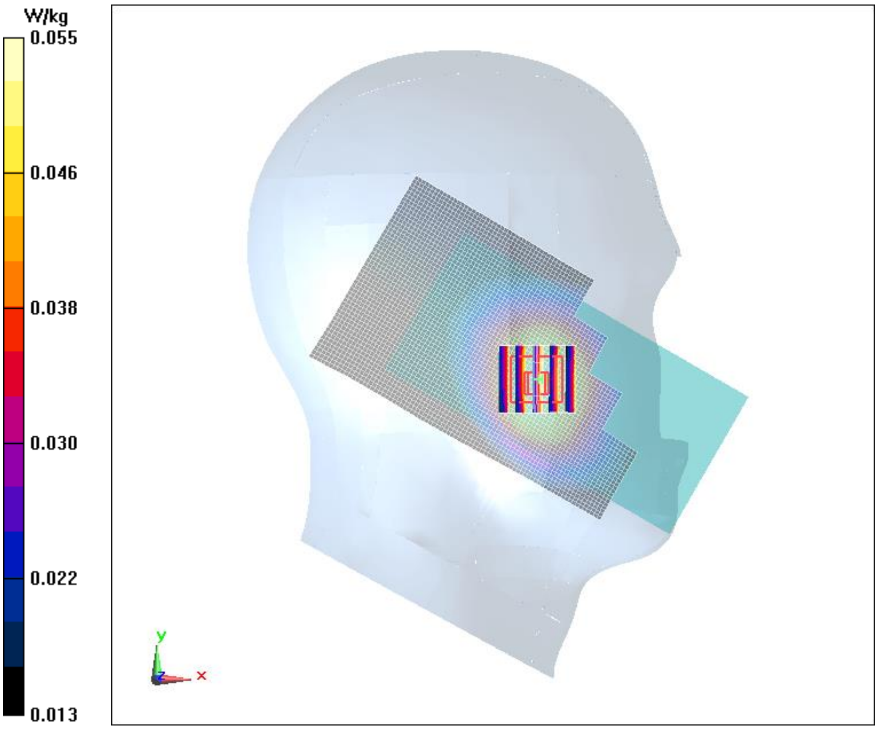


Fig.16 LTE 12 10MHz 1RB 49 Offset Ground Mode Low

Date/Time: 2019/6/20
Electronics: DAE4 Sn1244
Medium parameters used: f = 704 MHz; σ = 0.836 S/m; ε_r = 42.235; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: LTE Band 12 Professional 750MHz; Frequency: 704 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.51, 6.51, 6.51); Calibrated: 9/4/2018

LTE 12 10MHz 1RB 49 Offset Ground Mode Low/Area Scan (81x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.164 W/kg

LTE 12 10MHz 1RB 49 Offset Ground Mode Low/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.57 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.150 W/kg; SAR(10 g) = 0.087 W/kg
Maximum value of SAR (measured) = 0.162 W/kg

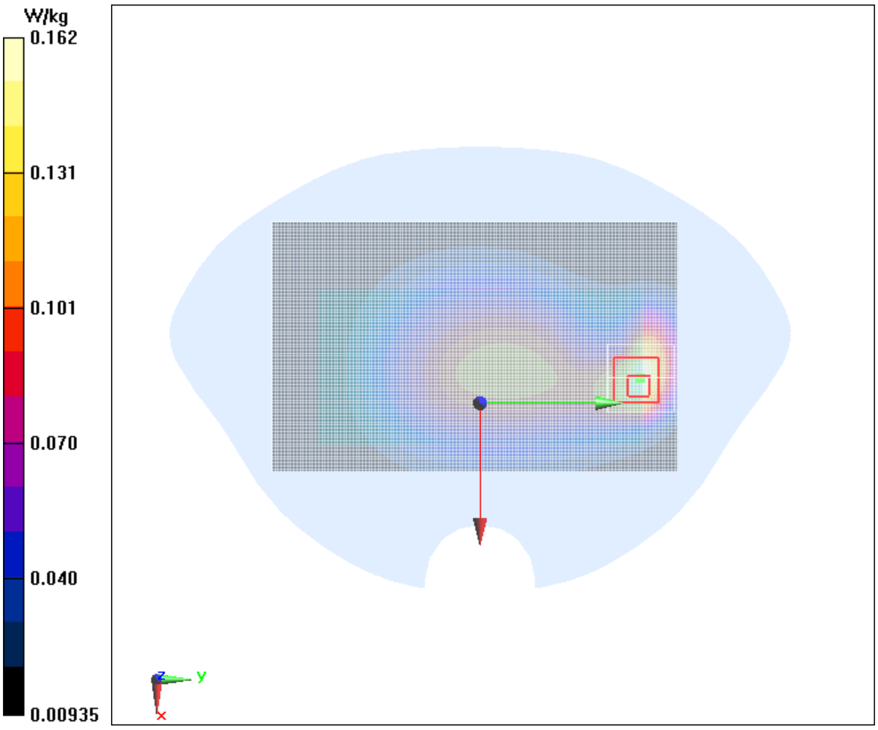


Fig.17 LTE 25 20MHz 1RB 50 Offset Left Cheek High

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1905 MHz; σ = 1.346 S/m; ε_r = 41.807; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 25 Professional 2000MHz; Frequency: 1905 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
LTE 25 20MHz 1RB 50 Offset Left Cheek High/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.279 W/kg
LTE 25 20MHz 1RB 50 Offset Left Cheek High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.247 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.442 W/kg
SAR(1 g) = 0.259 W/kg; SAR(10 g) = 0.154 W/kg
Maximum value of SAR (measured) = 0.282 W/kg

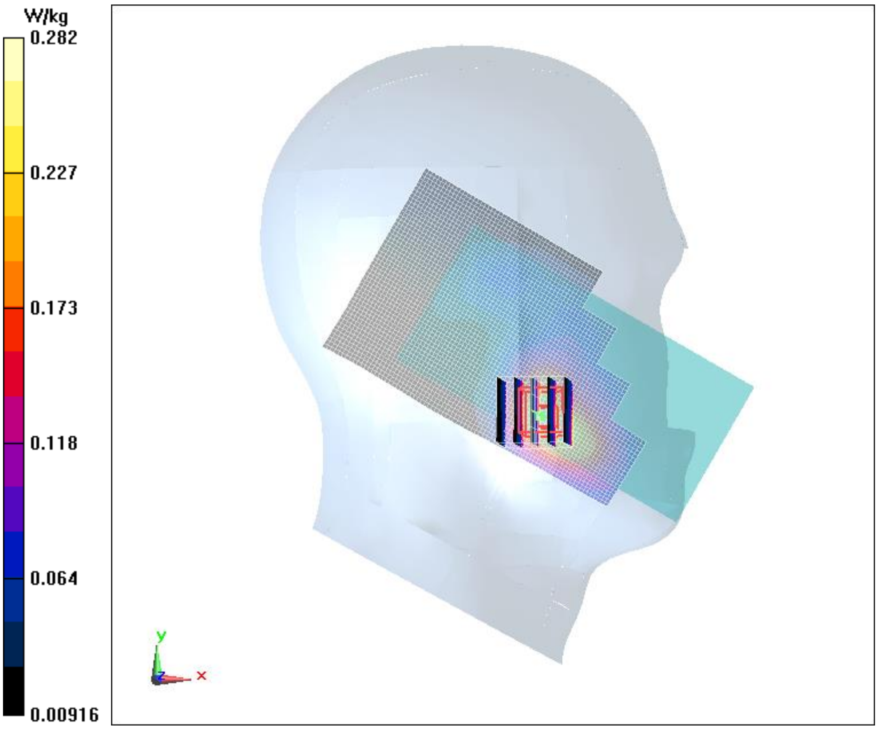


Fig.18 LTE 25 20MHz 1RB 50 Offset Ground Mode High

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1905 MHz; σ = 1.346 S/m; ε_r = 41.807; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 25 Professional 2000MHz; Frequency: 1905 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
LTE 25 20MHz 1RB 50 Offset Ground Mode High/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.529 W/kg
LTE 25 20MHz 1RB 50 Offset Ground Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.487 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.906 W/kg
SAR(1 g) = 0.526 W/kg; SAR(10 g) = 0.299 W/kg
Maximum value of SAR (measured) = 0.578 W/kg

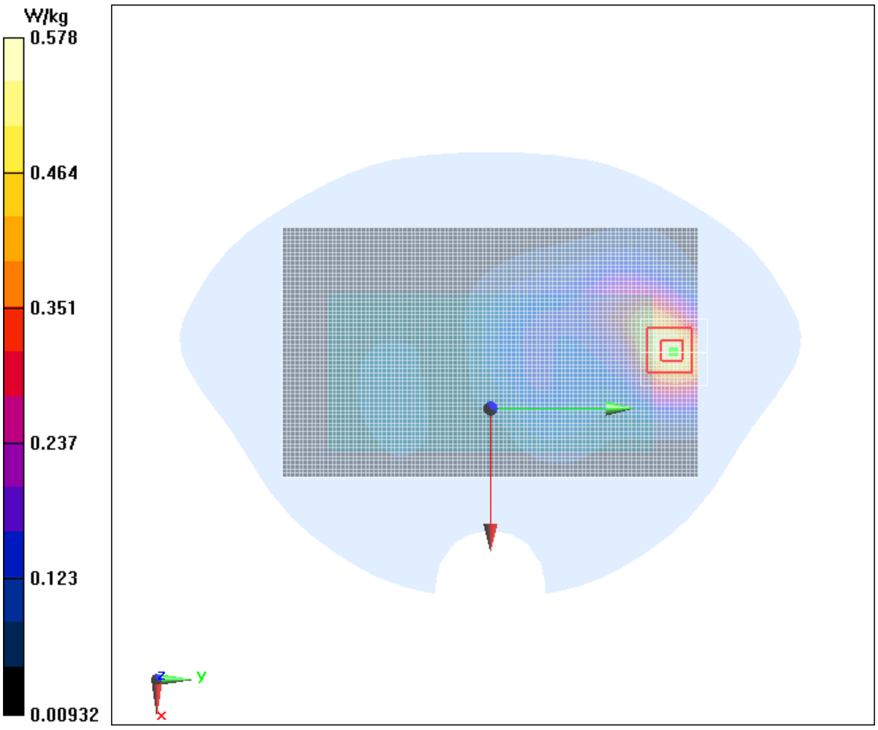


Fig.19 LTE 26 15MHz 1RB 37 Offset Right Cheek Middle

Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used (interpolated): f = 831.5 MHz; σ = 0.929 S/m; ε_r = 42.673; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 26 Professional 900MHz; Frequency: 831.5 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
LTE 26 15MHz 1RB 37 Offset Right Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.140 W/kg
LTE 26 15MHz 1RB 37 Offset Right Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.431 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.169 W/kg
SAR(1 g) = 0.134 W/kg; SAR(10 g) = 0.103 W/kg
Maximum of SAR (measured) = 0.140 W/kg

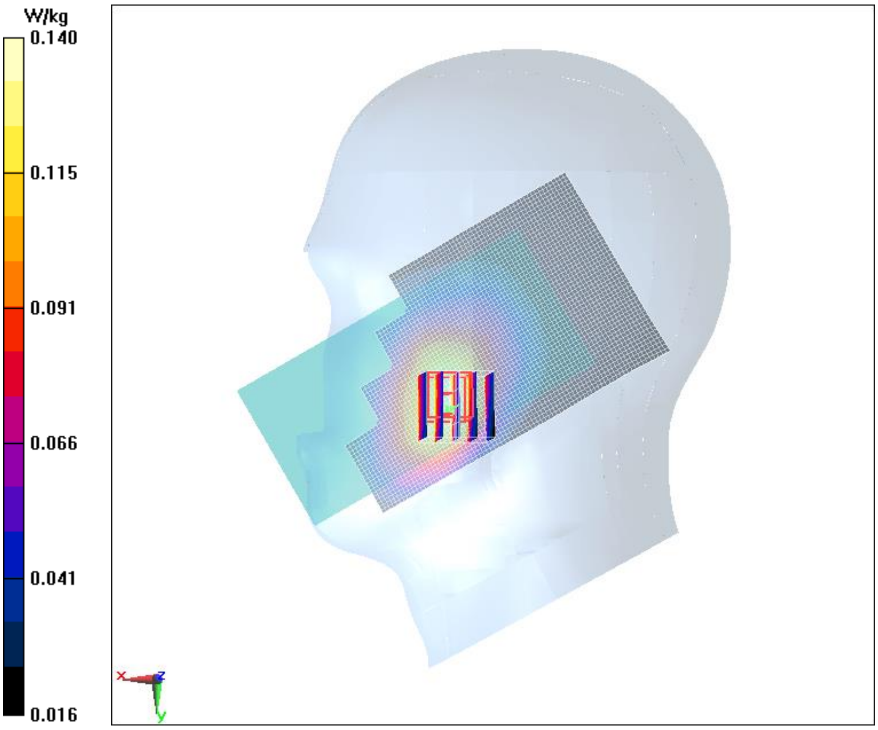


Fig.20 LTE 26 15MHz 1RB 37 Offset Ground Mode Middle

Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used (interpolated): f = 831.5 MHz; σ = 0.929 S/m; ε_r = 42.673; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: LTE Band 26 Professional 900MHz; Frequency: 831.5 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
LTE 26 15MHz 1RB 37 Offset Ground Mode Middle/Area Scan (81x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.213 W/kg
LTE 26 15MHz 1RB 37 Offset Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.07 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.372 W/kg
SAR(1 g) = 0.213 W/kg; SAR(10 g) = 0.124 W/kg
Maximum value of SAR (measured) = 0.230 W/kg

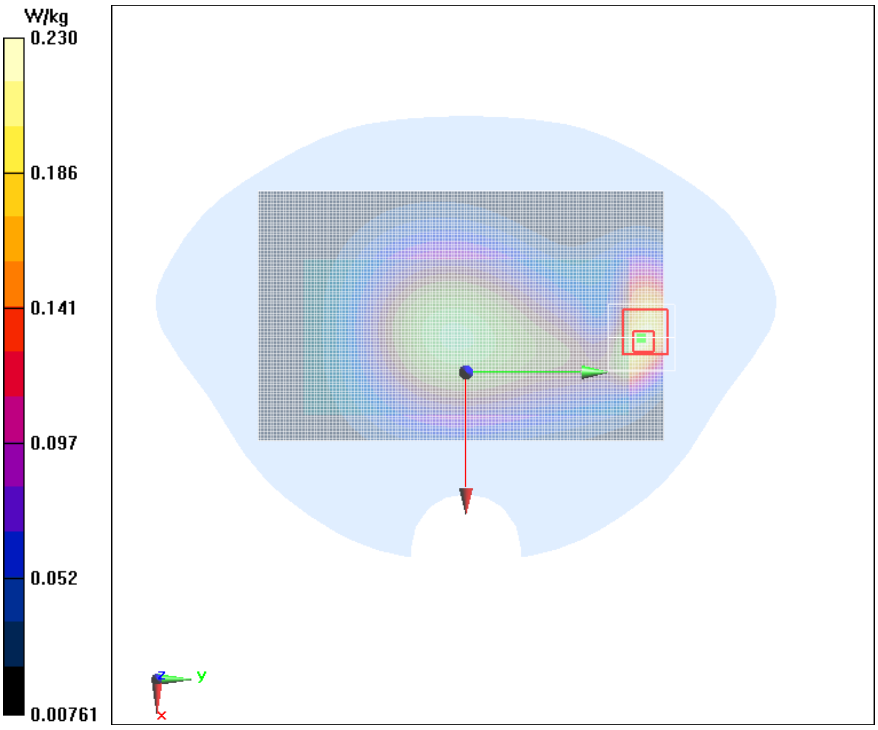


Fig.21 LTE B41 20MHz 1RB 50offset Left Cheek Middle

Date/Time: 2019/7/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 2605 MHz; σ = 1.991 S/m; ε_r = 38.949; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: LTE Band 41 Professional nonstandard 2600MHz; Frequency: 2605 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.46, 4.46, 4.46); Calibrated: 9/4/2018
LTE B41 20MHz 1RB 50offset Left Cheek Middle/Area Scan (101x51x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0610 W/kg
LTE B41 20MHz 1RB 50offset Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.9620 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.105 W/kg
SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.022 W/kg
Maximum value of SAR (measured) = 0.0558 W/kg

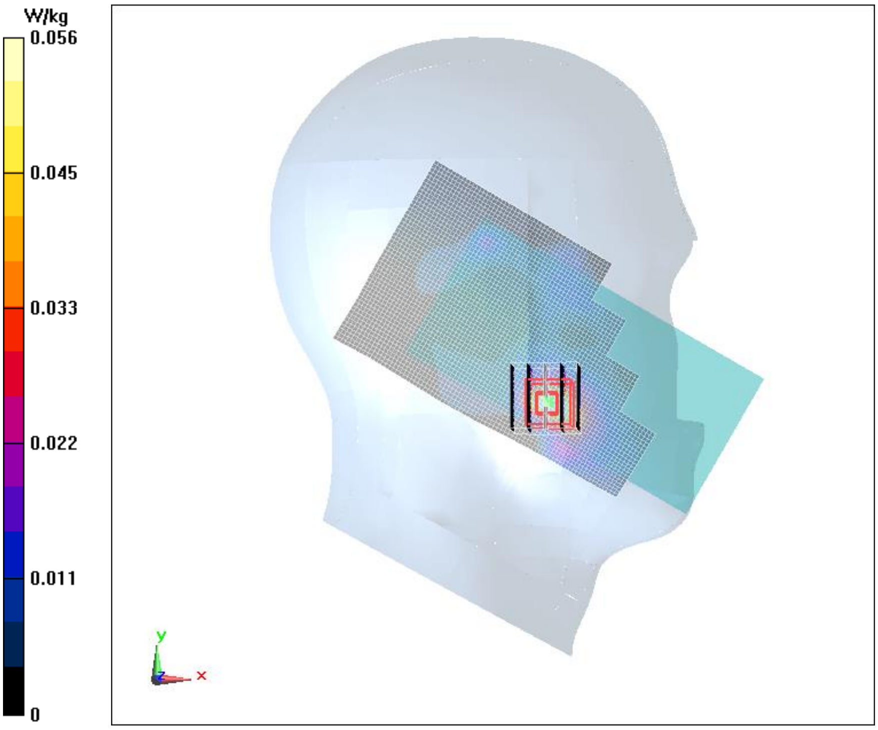


Fig.22 LTE B41 20MHz 1RB 50offset Ground Mode Middle

Date/Time: 2019/7/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 2605 MHz; σ = 1.991 S/m; ε_r = 38.949; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: LTE Band 41 Professional nonstandard 2600MHz; Frequency: 2605 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.46, 4.46, 4.46); Calibrated: 9/4/2018
LTE B41 20MHz 1RB 50offset Ground Mode Middle/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.633 W/kg
LTE B41 20MHz 1RB 50offset Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.775 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.642 W/kg; SAR(10 g) = 0.302 W/kg
Maximum value of SAR (measured) = 0.669 W/kg

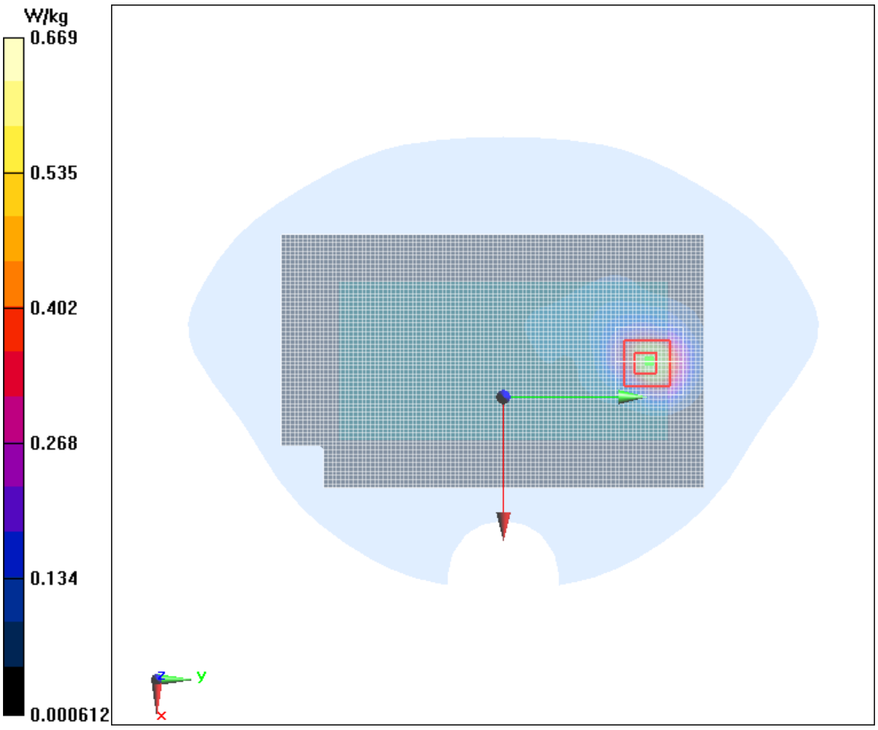


Fig.23 CDMA BC0 Right Cheek Middle 1xRTT

Date/Time: 2019/7/18
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 0.94 S/m; ε_r = 42.94; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: CDMA 835MHz 900MHz; Frequency: 836.52 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018
CDMA BC0 Right Cheek Middle 1xRTT/Area Scan (111x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.140 W/kg
CDMA BC0 Right Cheek Middle 1xRTT/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.502 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.160 W/kg
SAR(1 g) = 0.129 W/kg; SAR(10 g) = 0.104 W/kg
Maximum of SAR (measured) = 0.138 W/kg

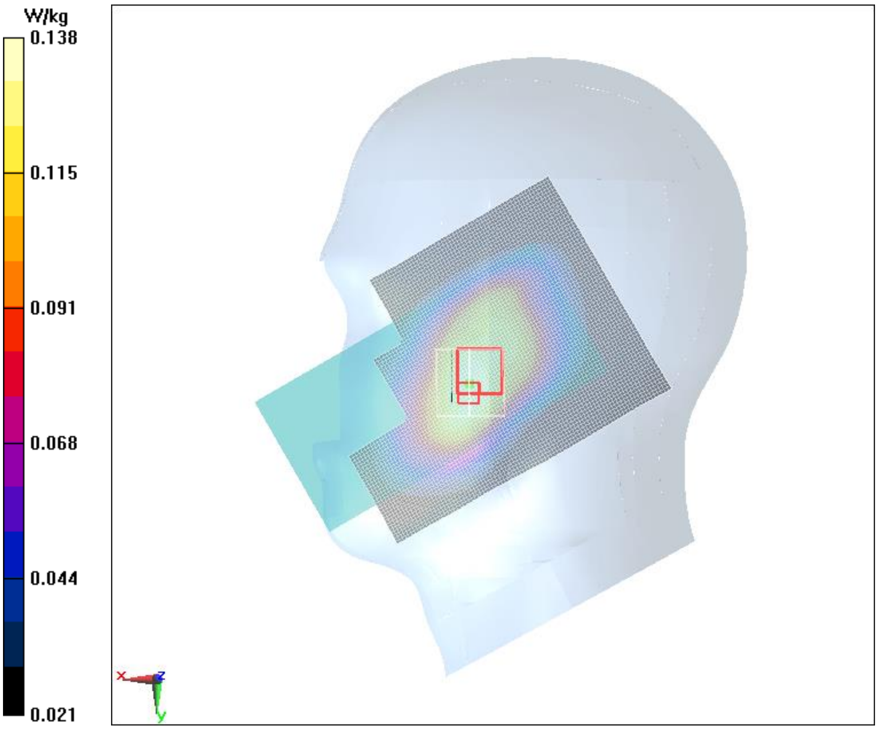


Fig.24 CDMA BC0 1xEV-DO-0 Ground Mode Middle 10mm

Date/Time: 2019/7/18
Electronics: DAE4 Sn1244
Medium parameters used: f = 837 MHz; σ = 0.94 S/m; ε_r = 42.94; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CDMA 835MHz 900MHz;   Frequency: 836.52 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018

CDMA BC0 1xEV-DO-0 Ground Mode Middle 10mm/Area Scan (71x121x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR   (Measurement) = 0.342 W/kg

CDMA BC0 1xEV-DO-0 Ground Mode Middle 10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.62 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.514 W/kg
SAR(1 g) = 0.313 W/kg; SAR(10 g) = 0.183 W/kg
Maximum value of SAR   (measured) = 0.345 W/kg

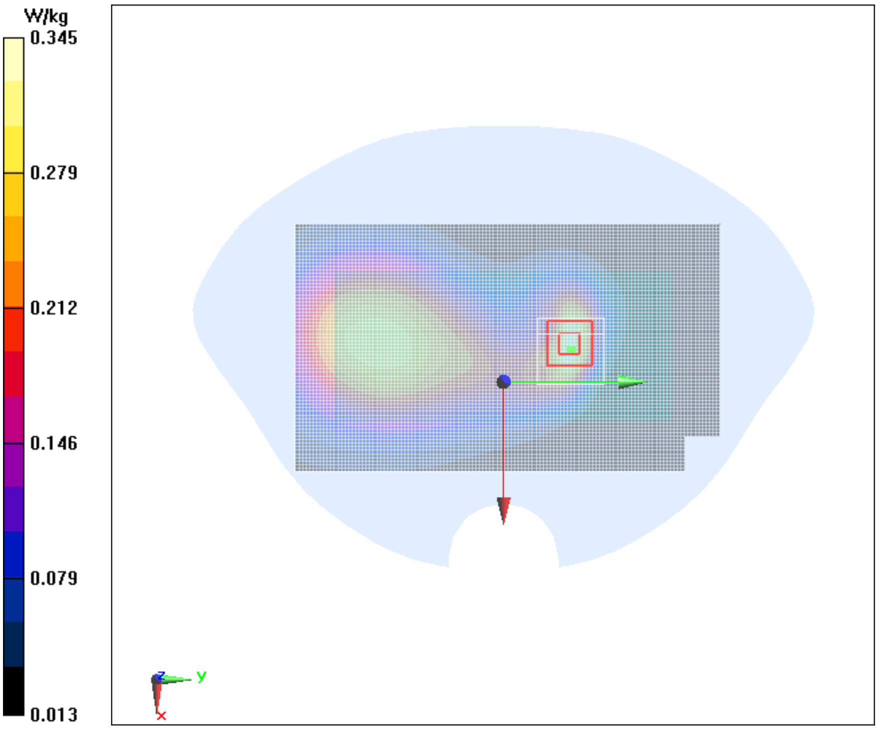


Fig.25 CDMA BC1 Left Tilt Middle 1xEV-DO-0

Date/Time: 2019/7/18
Electronics: DAE4 Sn1244
Medium parameters used: f = 1880 MHz; σ = 1.329 S/m; ε_r = 41.244; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CDMA 1900MHz 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
CDMA BC1 Left Tilt Middle 1xEV-DO-0/Area Scan (111x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.204 W/kg
CDMA BC1 Left Tilt Middle 1xEV-DO-0/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.142 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.176 W/kg; SAR(10 g) = 0.110 W/kg
Maximum value of SAR (measured) = 0.186 W/kg

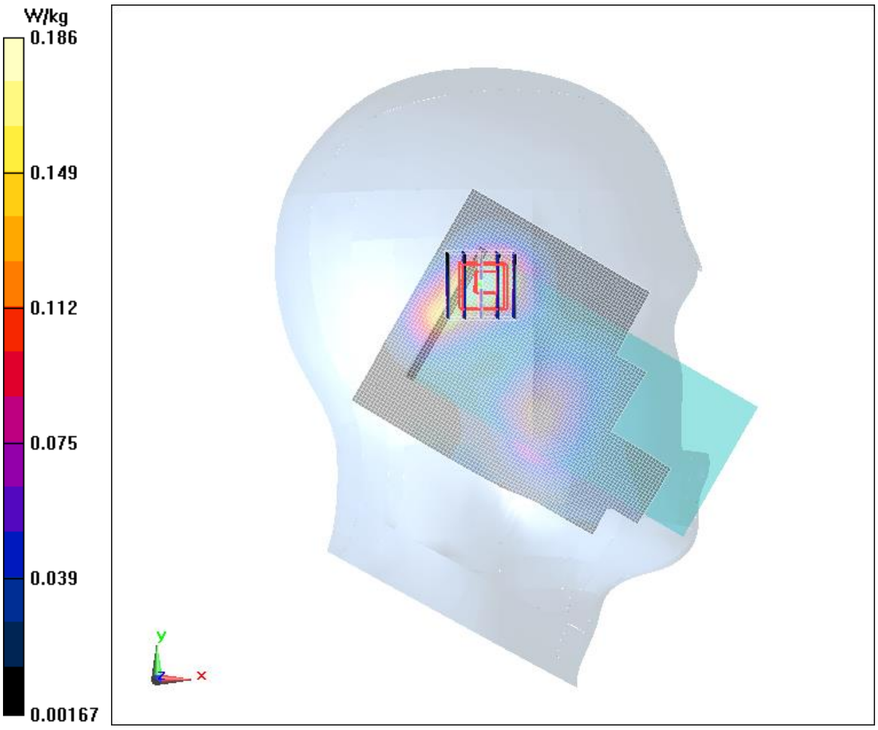


Fig.26 CDMA BC1 1xEV-DO-0 Ground Mode High 10mm Repeated

Date/Time: 2019/7/18
Electronics: DAE4 Sn1244
Medium parameters used: f = 1909 MHz; σ = 1.346 S/m; ε_r = 41.116; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CDMA 1900MHz 1900MHz; Frequency: 1908.75 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
CDMA BC1 1xEV-DO-0 Ground Mode High 10mm Repeated/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.873 W/kg
CDMA BC1 1xEV-DO-0 Ground Mode High 10mm Repeated/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.088 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.823 W/kg; SAR(10 g) = 0.474 W/kg
Maximum value of SAR (measured) = 0.882 W/kg

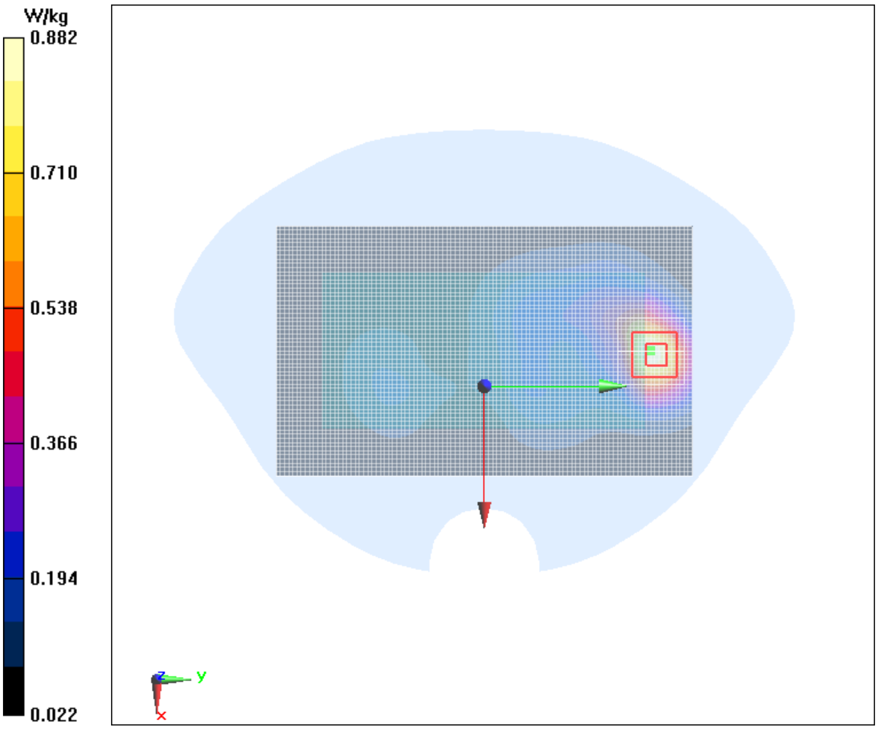


Fig.27 WIFI 2450 Right Cheek Middle

Date/Time: 2019/7/3

Electronics: DAE4 Sn1244

Medium parameters used: f = 2462 MHz; σ = 1.786 S/m; ε_r = 39.471; ρ = 1000 kg/m^3

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

Communication System: Wifi 2450 2450MHz; Frequency: 2462 MHz; Duty Cycle: 1:1

Probe: ES3DV3 - SN3252ConvF(4.74, 4.74, 4.74); Calibrated: 9/4/2018

WIFI 2450 Right Cheek Middle/Area Scan (101x51x1):

Measurement grid: dx=10 mm, dy=10 mm

Maximum value of SAR (Measurement) = 0.247 W/kg

WIFI 2450 Right Cheek Middle/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.273 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.848 W/kg

SAR(1 g) = 0.345 W/kg; SAR(10 g) = 0.148 W/kg

Maximum of SAR (measured) = 0.396 W/kg

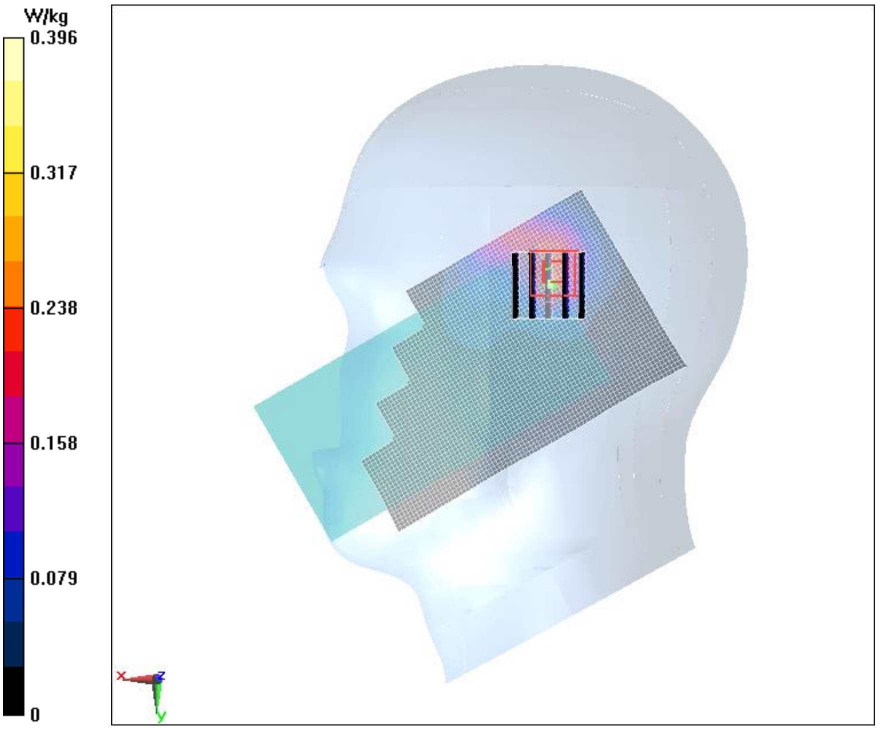


Fig.28 WIFI 2450 Left Mode High

Date/Time: 2019/7/3
Electronics: DAE4 Sn1244
Medium parameters used: f = 2462 MHz; σ = 1.786 S/m; ε_r = 39.471; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: Wifi 2450 2450MHz; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.74, 4.74, 4.74); Calibrated: 9/4/2018

WIFI 2450 Left Mode High/Area Scan (31x91x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0971 W/kg

WIFI 2450 Left Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.320 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.252 W/kg
SAR(1 g) = 0.113 W/kg; SAR(10 g) = 0.051 W/kg
Maximum value of SAR (measured) = 0.126 W/kg

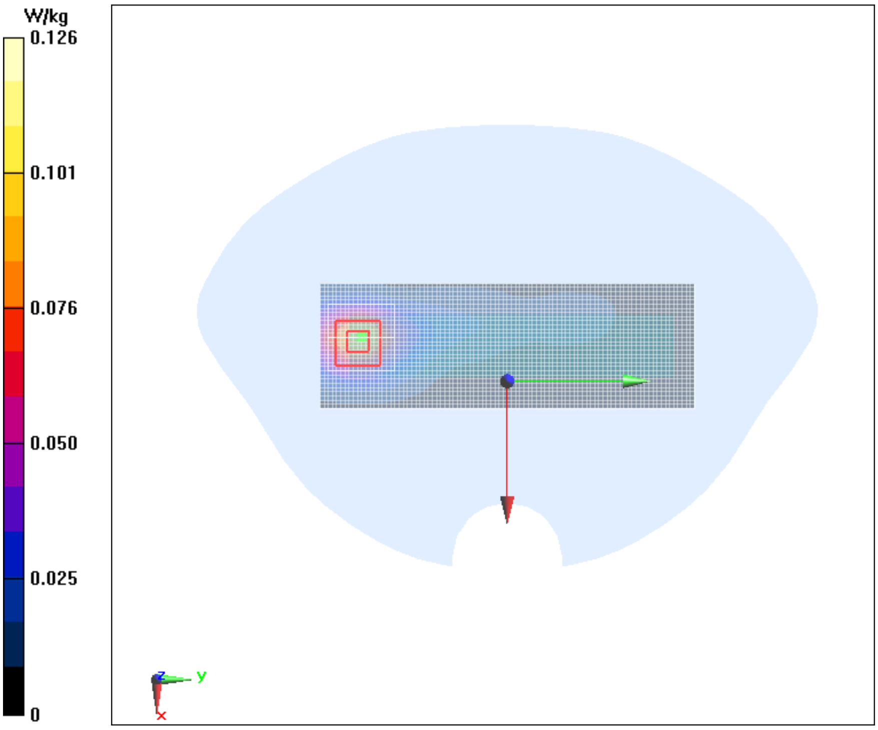


Fig.29 WIFI 5G Right Tilt

Date/Time: 2019/7/4
Electronics: DAE4 Sn1244
Medium parameters used: f = 5745 MHz; σ = 5.167 S/m; ε_r = 36.188; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: 5GHz U-NII-3 5GHz; Frequency: 5745 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(5.25, 5.25, 5.25); Calibrated: 1/15/2019
WIFI 5G Right Tilt/Area Scan (181x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.160 W/kg
WIFI 5G Right Tilt/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.852 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.240 W/kg
SAR(1 g) = 0.054 W/kg; SAR(10 g) = 0.017 W/kg
Maximum of SAR (measured) = 0.152 W/kg

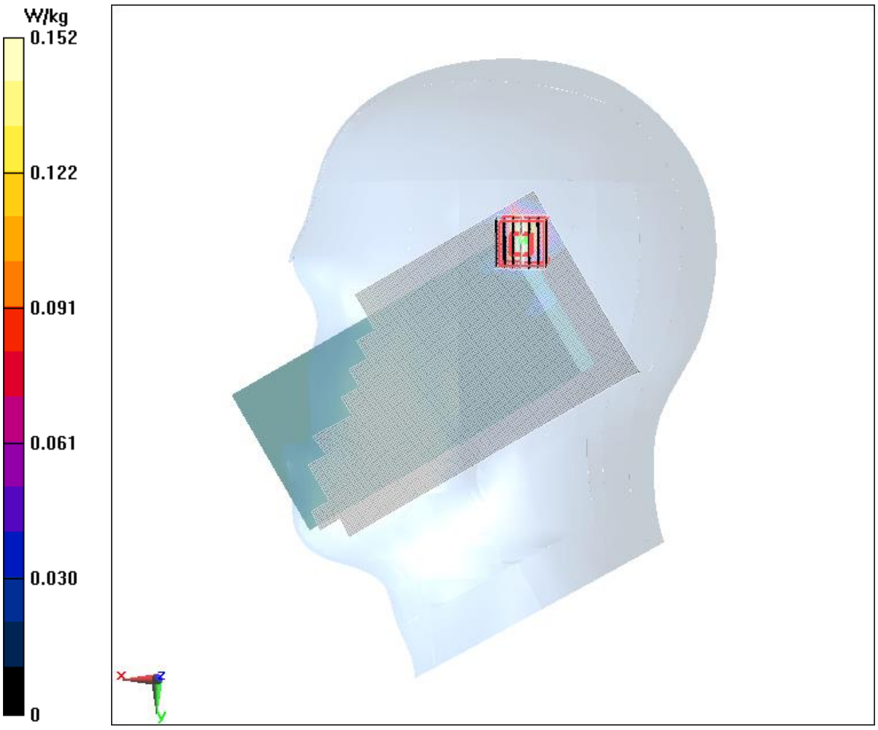
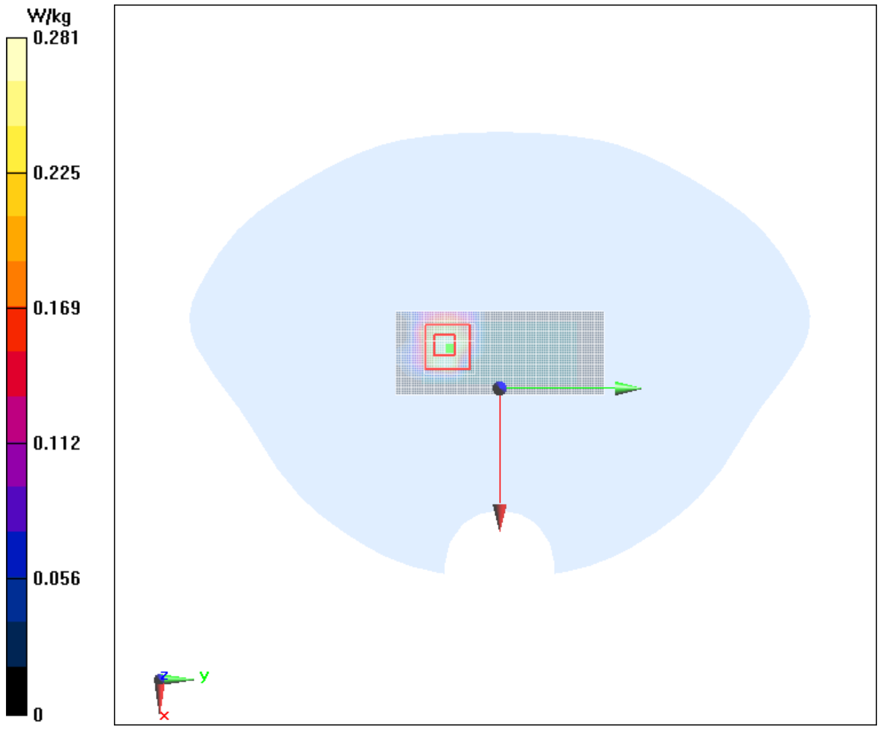


Fig.30 WIFI 5G Top Mode Middle

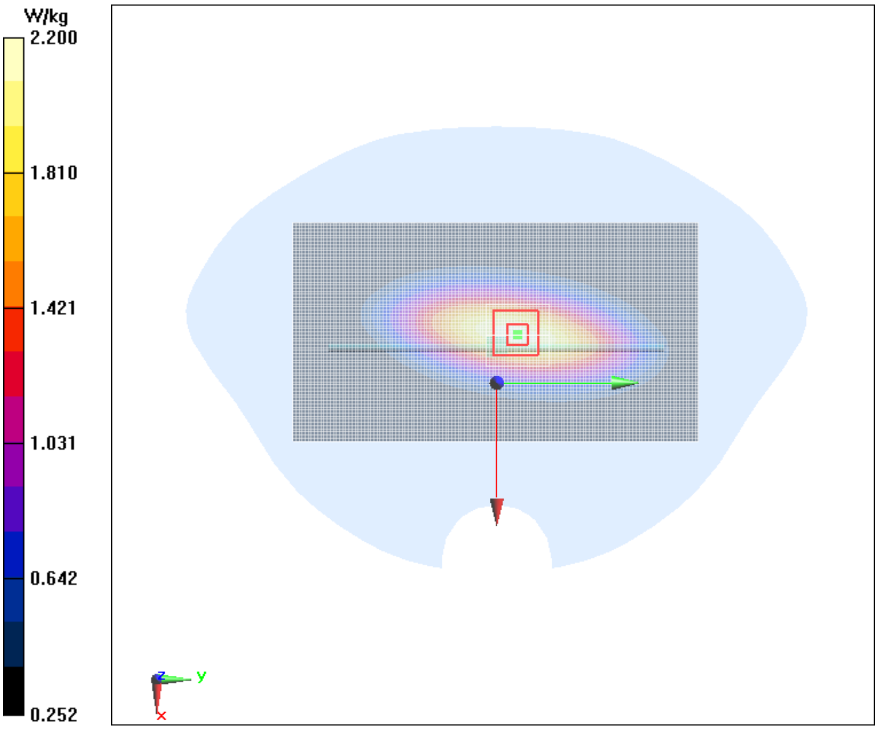
Date/Time: 2019/7/4
Electronics: DAE4 Sn1244
Medium parameters used: f = 5180 MHz; σ = 4.545 S/m; ε_r = 37.254; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: 5GHz U-NII-1 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(5.82, 5.82, 5.82); Calibrated: 1/15/2019
WIFI 5G Top Mode Middle/Area Scan (41x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.332 W/kg
WIFI 5G Top Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.457 W/kg
SAR(1 g) = 0.115 W/kg; SAR(10 g) = 0.039 W/kg
Maximum of SAR (measured) = 0.281 W/kg



ANNEX B. System Validation Results

750MHz

Date/Time: 2019/6/20
Electronics: DAE4 Sn1244
Medium parameters used: f = 750 MHz; σ = 0.878 S/m; ε_r = 41.565; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: CW 750MHz; Frequency: 750 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.51, 6.51, 6.51); Calibrated: 9/4/2018
System Validation /Area Scan (71x131x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 2.15 W/kg
System Validation /Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.11 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 2.98 W/kg
SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.38 W/kg
Maximum value of SAR (measured) = 2.20 W/kg



835MHz-1

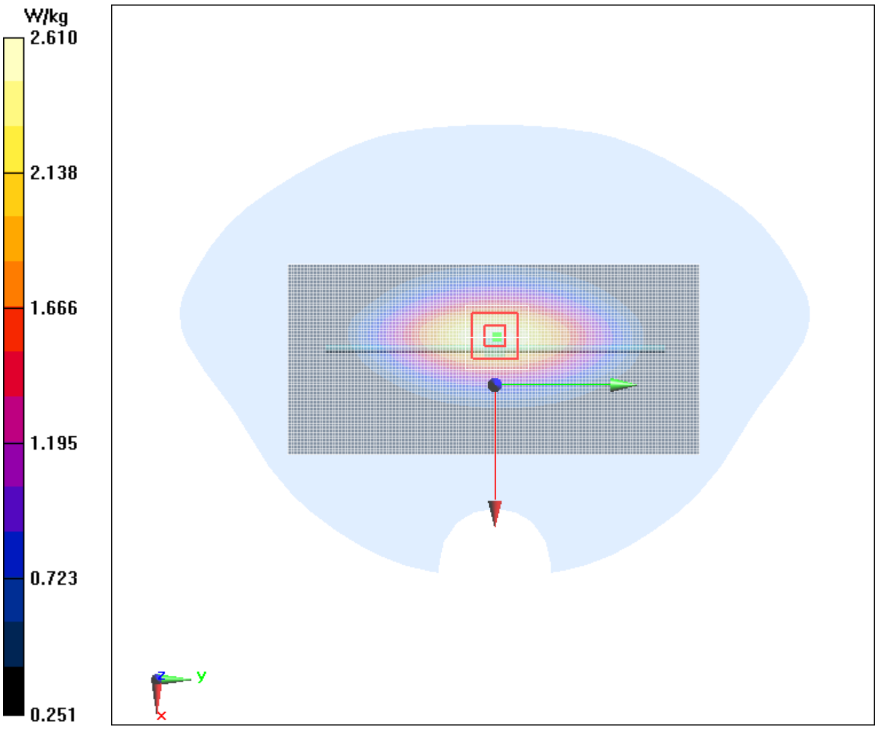
Date/Time: 2019/6/16
Electronics: DAE4 Sn1244
Medium parameters used: f = 835 MHz; σ = 0.932 S/m; ε_r = 42.632; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C　　Liquid Temperature:22.5°C
Communication System: CW 900MHz;　Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018

System Validation/Area Scan (61x131x1):

Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR　(Measurement) = 2.52 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.20 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR　(measured) = 2.61 W/kg



835MHz-2

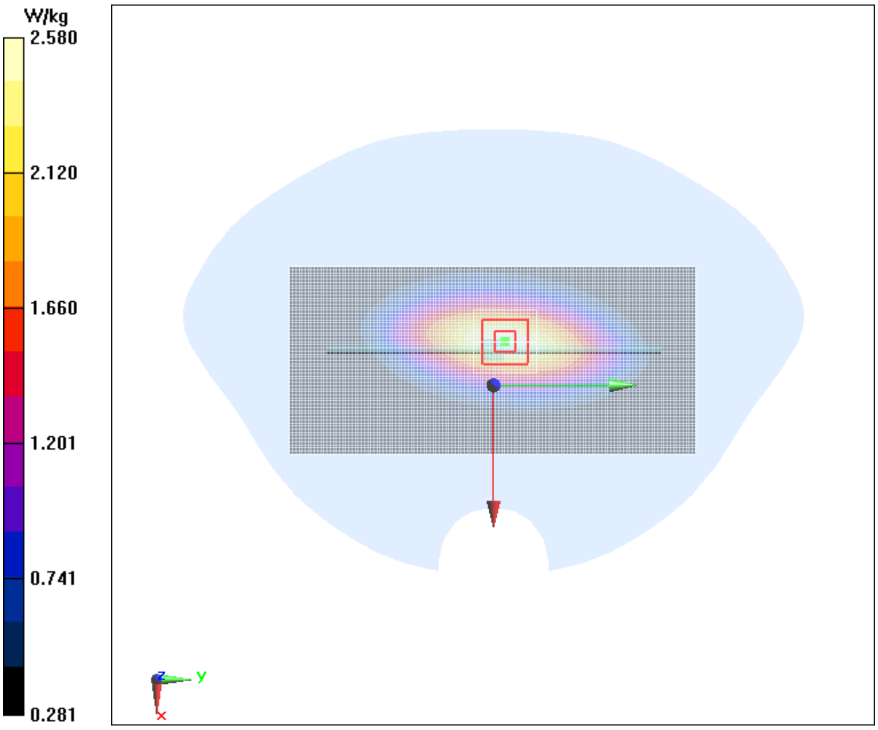
Date/Time: 2019/7/18
Electronics: DAE4 Sn1244
Medium parameters used: f = 835 MHz; σ = 0.939 S/m; ε_r = 42.971; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: CW 900MHz; Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.36, 6.36, 6.36); Calibrated: 9/4/2018

System Validation/Area Scan (61x131x1):

Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 2.57 W/kg

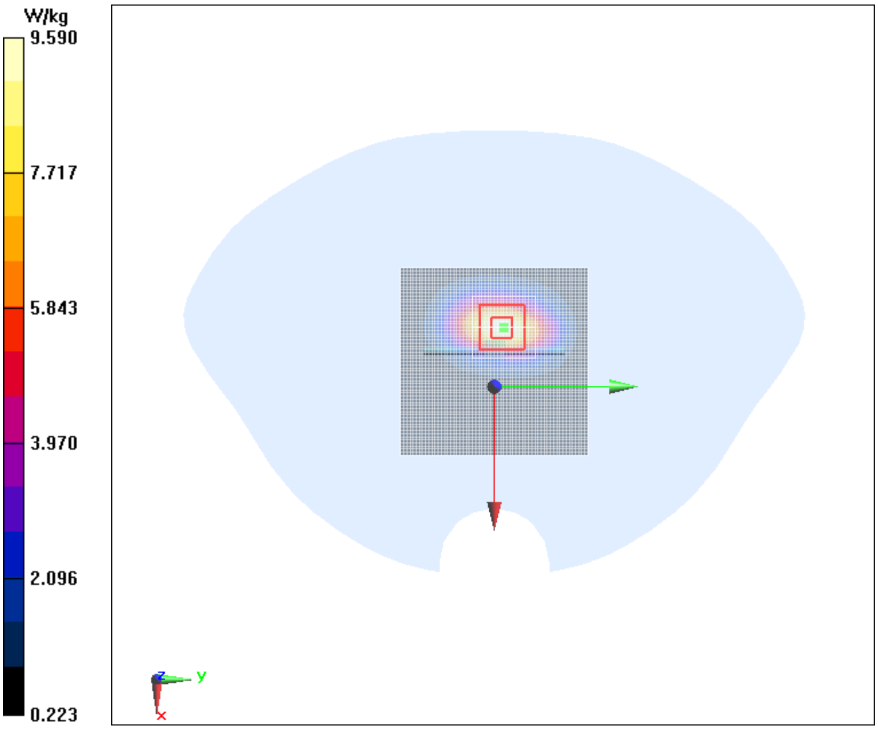
System Validation/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.70 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 3.44 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (measured) = 2.58 W/kg



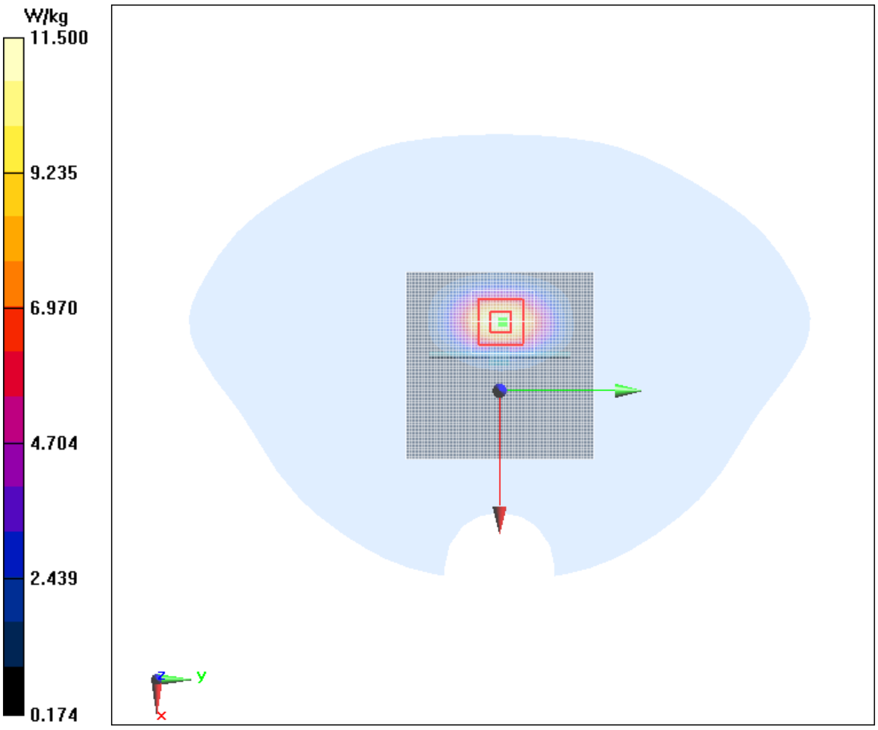
1750MHz

Date/Time: 2019/6/22
Electronics: DAE4 Sn1244
Medium parameters used: f = 1750 MHz; σ = 1.315 S/m; ε_r = 40.002; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CW 1750MHz; Frequency: 1750 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.39, 5.39, 5.39); Calibrated: 9/4/2018
System check Validation/Area Scan (61x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 9.62 W/kg
System check Validation/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.00 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 8.57 W/kg; SAR(10 g) = 4.61 W/kg
Maximum value of SAR (measured) = 9.59 W/kg



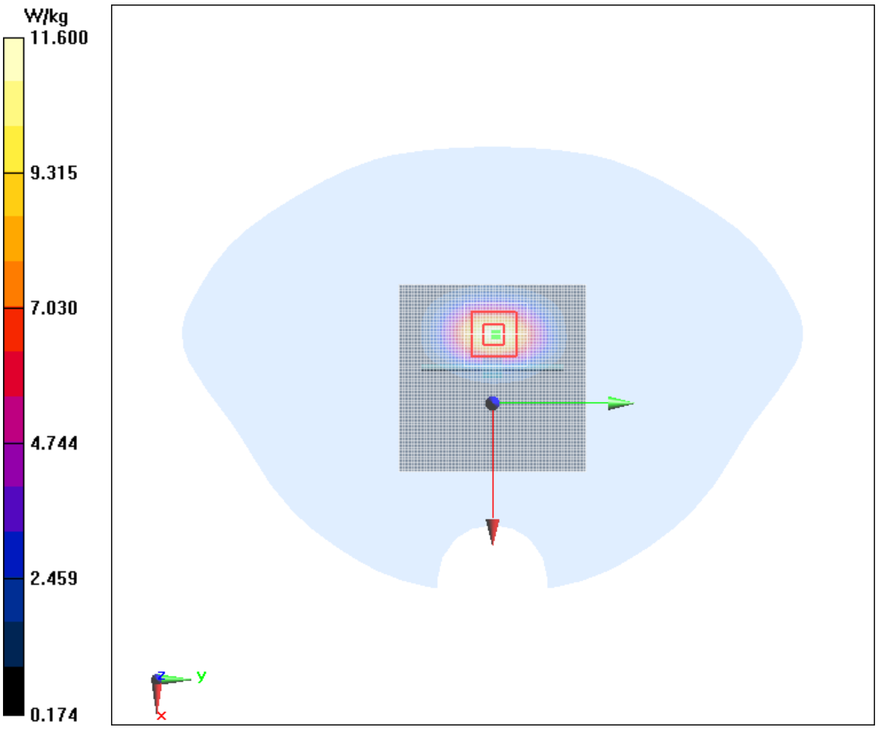
1900MHz-1

Date/Time: 2019/6/15
Electronics: DAE4 Sn1244
Medium parameters used: f = 1900 MHz; σ = 1.352 S/m; ε_r = 41.831; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CW 2000MHz; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
System Validation/Area Scan (61x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 11.1 W/kg
System Validation/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.95 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 19.6 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.2 W/kg
Maximum value of SAR (measured) = 11.5 W/kg



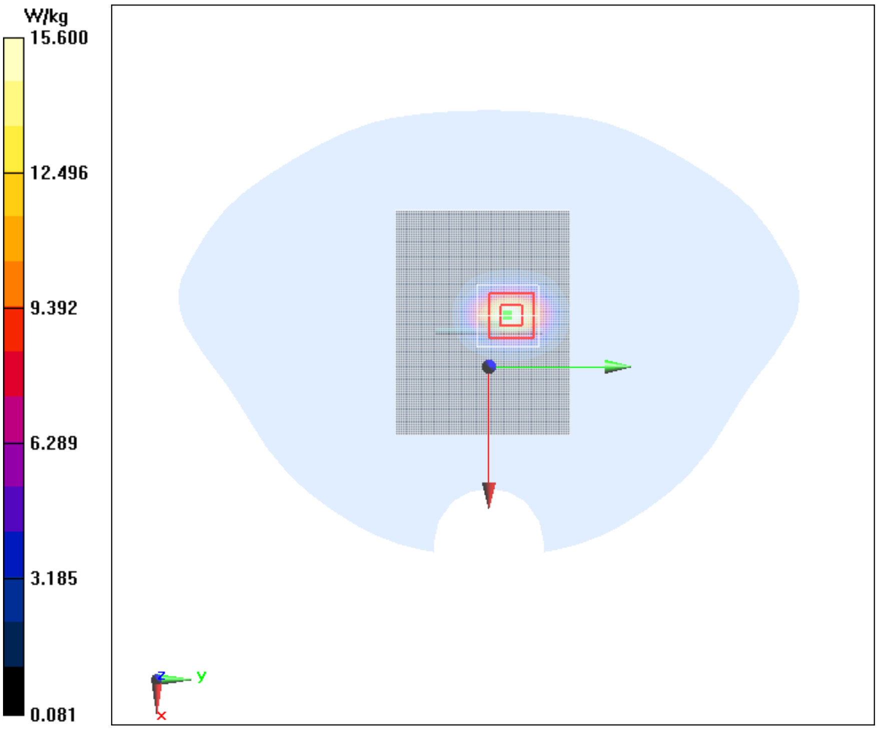
1900MHz-2

Date/Time: 2019/7/18
Electronics: DAE4 Sn1244
Medium parameters used: f = 1900 MHz; σ = 1.348 S/m; ε_r = 41.157; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CW 1900MHz;   Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.18, 5.18, 5.18); Calibrated: 9/4/2018
System Validation/Area Scan (61x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 11.2 W/kg
System Validation/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 47.52 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 19.7 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.24 W/kg
Maximum value of SAR (measured) = 11.6 W/kg



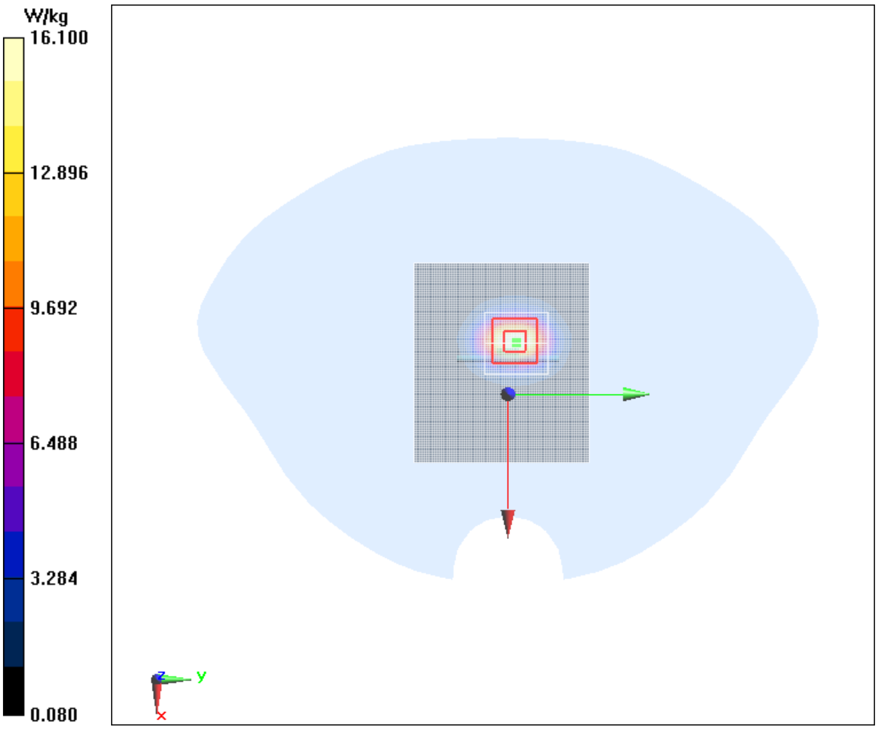
2450MHz

Date/Time: 2019/7/3
Electronics: DAE4 Sn1244
Medium parameters used: f = 2450 MHz; σ = 1.771 S/m; ε_r = 39.513; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CW 2600MHz;   Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.74, 4.74, 4.74); Calibrated: 9/4/2018
System Validation/Area Scan (91x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR   (Measurement) = 16.3 W/kg
System Validation/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 67.32 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 29.5 W/kg
SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.26 W/kg
Maximum value of SAR   (measured) = 15.6 W/kg



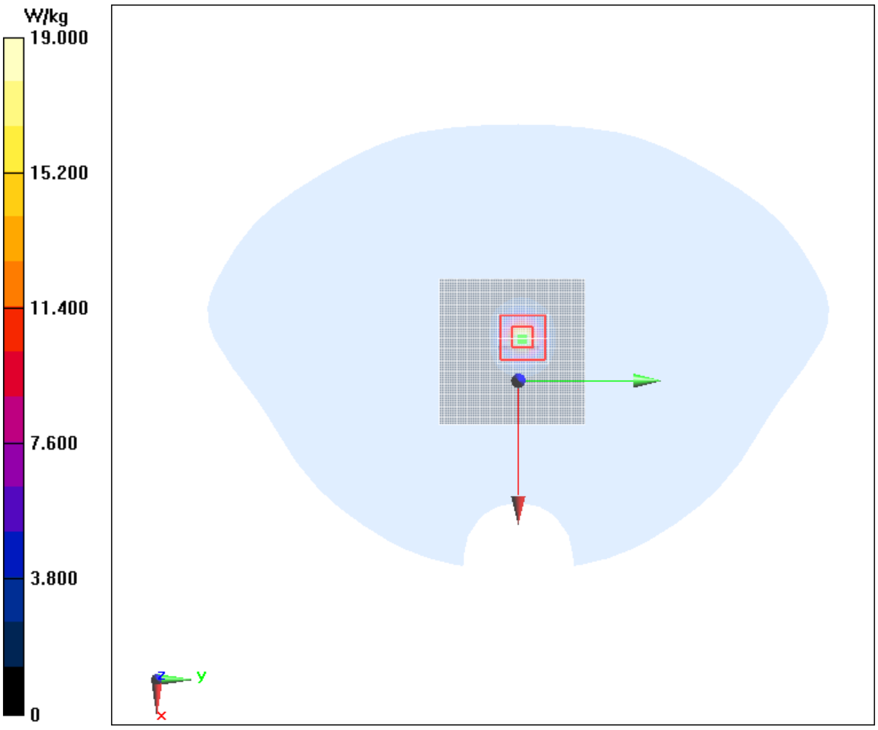
2600MHz

Date/Time: 2019/7/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 2600 MHz; σ = 1.942 S/m; ε_r = 38.951; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: CW 2600MHz; Frequency: 2600 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.46, 4.46, 4.46); Calibrated: 9/4/2018
System Validation/Area Scan (81x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 16.4 W/kg
System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 69.77 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 30.4 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.39 W/kg
Maximum value of SAR (measured) = 16.1 W/kg



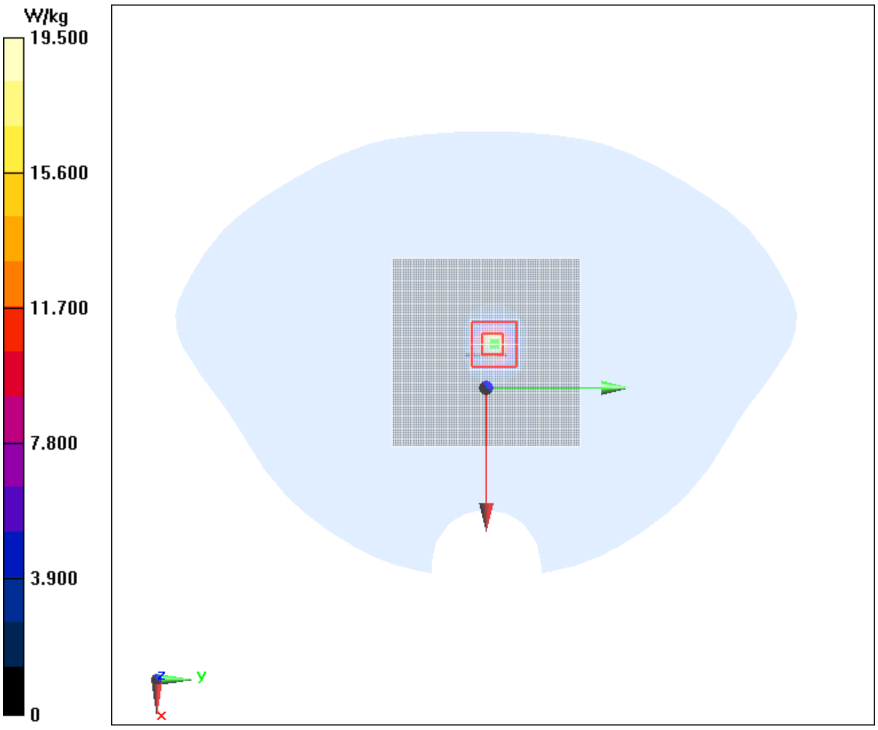
5200MHz

Date/Time: 2019/6/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 5200 MHz; σ = 4.566 S/m; ε_r = 37.215; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C Liquid Temperature:22.5°C
Communication System: 5GHz; Frequency: 5200 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(5.82, 5.82, 5.82); Calibrated: 1/15/2019
System Validation /Area Scan (71x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 18.8 W/kg
System Validation /Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.37 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 32.0 W/kg
SAR(1 g) = 7.26 W/kg; SAR(10 g) = 2.07 W/kg
Maximum of SAR (measured) = 19.0 W/kg



5800MHz

Date/Time: 2019/6/19
Electronics: DAE4 Sn1244
Medium parameters used: f = 5800 MHz; σ = 5.227 S/m; ε_r = 36.092; ρ = 1000 kg/m^3
Ambient Temperature:22.5°C   Liquid Temperature:22.5°C
Communication System: CW 5GHz; Frequency: 5800 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN7401ConvF(5.25, 5.25, 5.25); Calibrated: 1/15/2019
System Validation/Area Scan (91x91x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 19.1 W/kg
System Validation/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.62 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 34.5 W/kg
SAR(1 g) = 7.14 W/kg; SAR(10 g) = 1.99 W/kg
Maximum value of SAR (measured) = 19.5 W/kg



ANNEX C. System Validation

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

Table C.1: System Validation Part 1

System No.	Probe SN.	Liquid name	Validation date	Frequency point	**Permittivity ε**	**Conductivity σ (S/m)**
1	3252	Head 750 MHz	2019-06-20	750 MHz	41.565	0.878
2	3252	Head 835 MHz-1	2019-06-16	835 MHz-1	42.632	0.931
3	3252	Head 835 MHz-2	2019-07-18	835 MHz-2	42.971	0.939
4	3252	Head 1800 MHz	2019-06-22	1800 MHz	39.829	1.365
5	3252	Head 1900 MHz-1	2019-06-15	1900 MHz-1	41.831	1.352
7	3252	Head 1900 MHz-2	2019-07-18	1900 MHz-2	41.157	1.348
8	3252	Head 2450 MHz	2019-07-03	2450 MHz	39.513	1.771
9	3252	Head 2600 MHz	2019-07-19	2600 MHz	38.951	1.942
10	7401	Head 5200 MHz	2019-07-04	5600 MHz	37.215	4.566
11	7401	Head 5800 MHz	2019-07-04	5800 MHz	36.092	5.227

Table C.2: System Validation Part 2

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

ANNEX D. Calibration Certification

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ilac-MRA CNAS 中国认可 国际互认 校准 CALIBRATION CNAS L0570
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Client : ECIT

Certificate No: Z18-60529

CALIBRATION CERTIFICATE

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

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	20-Jun-18 (CTTL, No.J18X05034)	June-19

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

Issued: December 05, 2018

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Glossary:

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

Methods Applied and Interpretation of Parameters:

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

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DC Voltage Measurement

A/D - Converter Resolution nominal

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

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

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

Connector Angle

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

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中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client ECIT | Certificate No: Z18-60343

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3252
Calibration Procedure(s)	FF-Z11-004-01 Calibration Procedures for Dosimetric E-field Probes
Calibration date:	September 04, 2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Power sensor NRP-Z91	101547	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Power sensor NRP-Z91	101548	20-Jun-18 (CTTL, No.J18X05032)	Jun-19
Reference10dBAttenuator	18N50W-10dB	09-Feb-18(CTTL, No.J18X01133)	Feb-20
Reference20dBAttenuator	18N50W-20dB	09-Feb-18(CTTL, No.J18X01132)	Feb-20
Reference Probe EX3DV4	SN 3846	25-Jan-18(SPEAG,No.EX3-3846_Jan18)	Jan-19
DAE4	SN 777	15-Dec-17(SPEAG, No.DAE4-777_Dec17)	Dec -18
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	21-Jun-18 (CTTL, No.J18X05033)	Jun-19
Network Analyzer E5071C	MY46110673	14-Jan-18 (CTTL, No.J18X00561)	Jan -19

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

Issued: September 06, 2018

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Glossary:

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

Calibration is Performed According to the Following Standards:

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

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

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

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

Methods Applied and Interpretation of Parameters:

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

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Probe ES3DV3

SN: 3252

Calibrated: September 04, 2018

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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

Basic Calibration Parameters

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

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	268.8	±2.5%
		Y	0.0	0.0	1.0		276.1	
		Z	0.0	0.0	1.0		278.3	

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

[A] The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5 and Page 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	6.51	6.51	6.51	0.40	1.42	±12.1%
835	41.5	0.90	6.36	6.36	6.36	0.40	1.56	±12.1%
900	41.5	0.97	6.31	6.31	6.31	0.45	1.48	±12.1%
1750	40.1	1.37	5.39	5.39	5.39	0.61	1.28	±12.1%
1900	40.0	1.40	5.18	5.18	5.18	0.67	1.26	±12.1%
2000	40.0	1.40	5.17	5.17	5.17	0.71	1.20	±12.1%
2300	39.5	1.67	4.92	4.92	4.92	0.90	1.14	±12.1%
2450	39.2	1.80	4.74	4.74	4.74	0.90	1.15	±12.1%
2600	39.0	1.96	4.46	4.46	4.46	0.72	1.37	±12.1%

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

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

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

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

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	55.5	0.96	6.53	6.53	6.53	0.40	1.50	±12.1%
835	55.2	0.97	6.34	6.34	6.34	0.42	1.58	±12.1%
900	55.0	1.05	6.29	6.29	6.29	0.47	1.51	±12.1%
1750	53.4	1.49	4.99	4.99	4.99	0.65	1.28	±12.1%
1900	53.3	1.52	4.77	4.77	4.77	0.75	1.23	±12.1%
2000	53.3	1.52	4.95	4.95	4.95	0.67	1.28	±12.1%
2300	52.9	1.81	4.63	4.63	4.63	0.90	1.15	±12.1%
2450	52.7	1.95	4.41	4.41	4.41	0.90	1.17	±12.1%
2600	52.5	2.16	4.19	4.19	4.19	0.90	1.15	±12.1%

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

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

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

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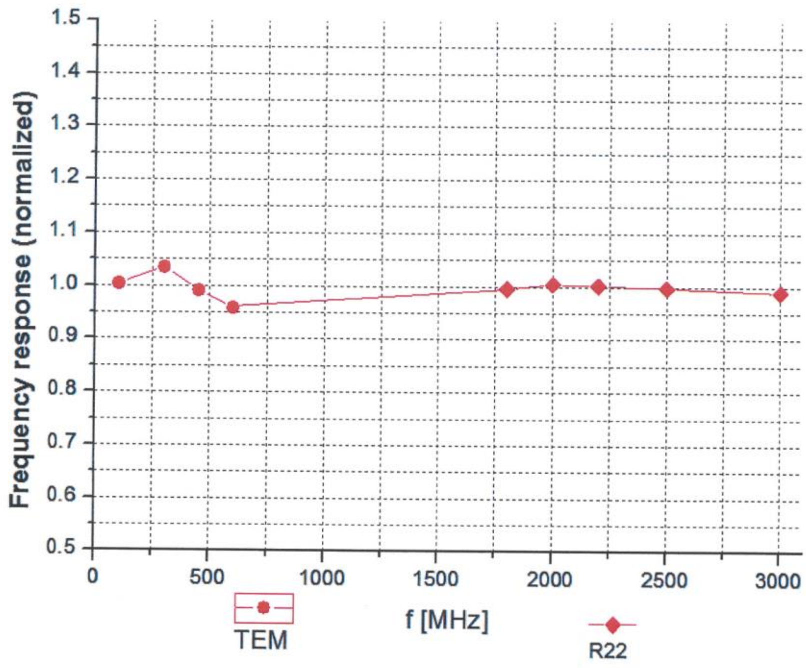
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



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

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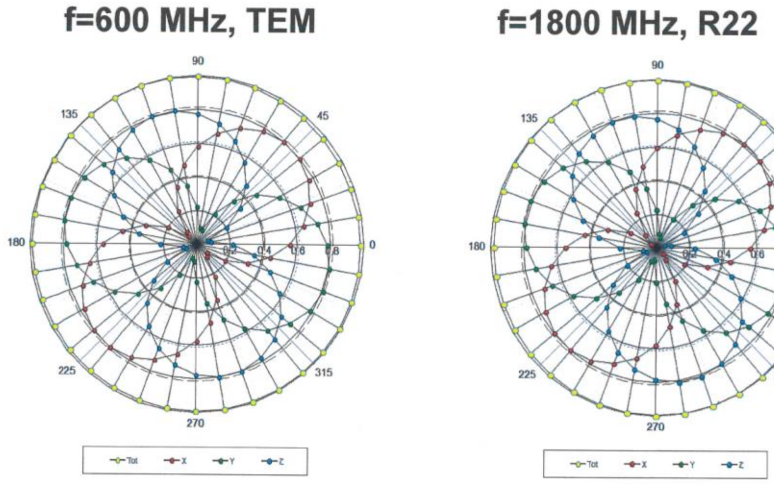
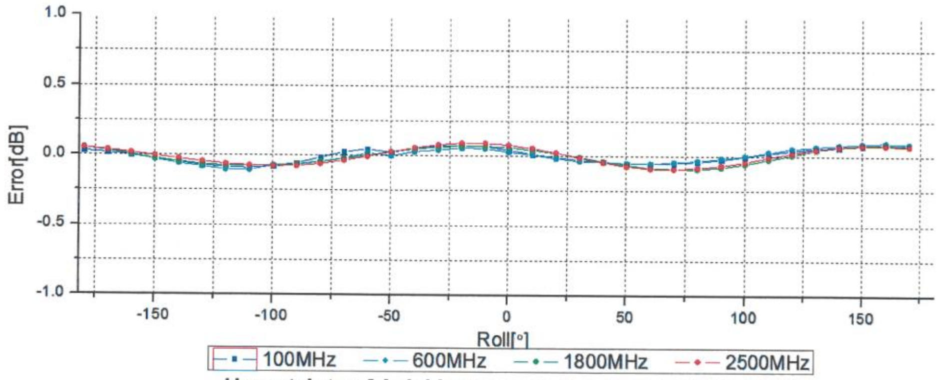
Receiving Pattern (Φ), θ=0°





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

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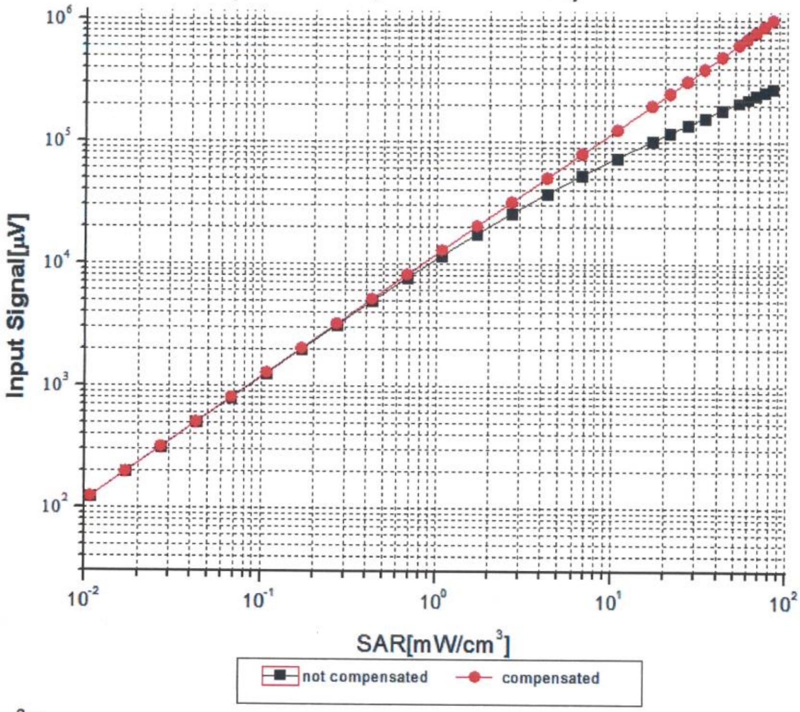
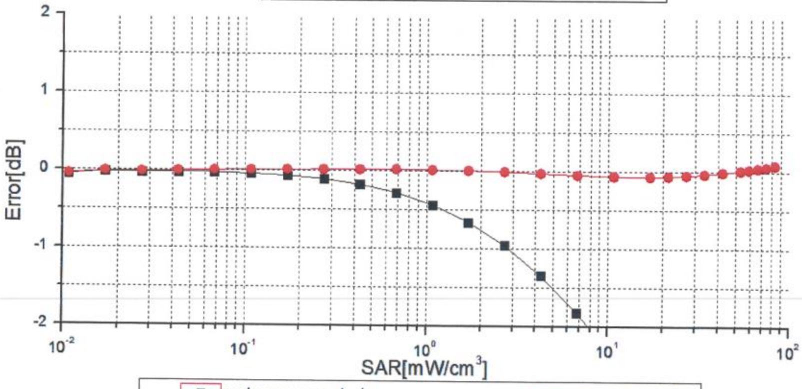
Dynamic Range f(SAR$_{head}$)
(TEM cell, f = 900 MHz)





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

Certificate No: Z18-60343 Page 9 of 11