SAR TEST REPORT

No. I19Z60716-SEM03

For

TCL Communication Ltd.

HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 5 Band Mobile Phone

Model Name: 4052R

With

Hardware Version: 04

Software Version: ZXXD

FCC ID: 2ACCJN031

Issued Date: 2019-6-24

TESTING
NVLAP LAB CODE 600118-0

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

No. 51, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Issue Date	Description
I19Z60716-SEM03	Rev.0	2019-6-24	Initial creation of test report
I19Z60716-SEM03	Rev.1	2019-7-3	Add result of BT on page 54.

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL(Shouxiang)
Address:	No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China100191

1.2 Testing Environment

Temperature:	18°C~25 °C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

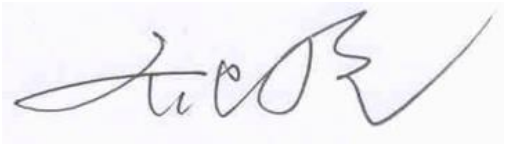
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	June 14, 2019
Testing End Date:	June 19, 2019

1.4 Signature

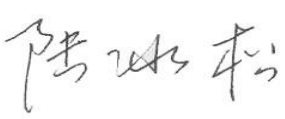
Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of SAR found during testing for TCL Communication Ltd. HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 5 Band Mobile Phone 4052R is as follows:

Table 2.1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g (W/Kg)	Equipment Class
Head (Separation Distance 0mm)	GSM 850	0.47	PCE
	PCS 1900	0.43	
	UMTS FDD 2	0.77	
	UMTS FDD 4	0.53	
	UMTS FDD 5	0.56	
	LTE Band 2	0.49	
	LTE Band 4	0.49	
	LTE Band 5	0.39	
	LTE Band 12	0.43	
	LTE Band 14	0.57	
	WLAN 2.4 GHz	0.61	DTS
Body-worn (Separation Distance 15mm)	GSM 850	0.27	PCE
	PCS 1900	0.53	
	UMTS FDD 2	0.90	
	UMTS FDD 4	1.06	
	UMTS FDD 5	0.40	
	LTE Band 2	0.67	
	LTE Band 4	0.76	
	LTE Band 5	0.36	
	LTE Band 12	0.49	
	LTE Band 14	0.54	
	WLAN 2.4 GHz	0.17	DTS

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the ANSI C95.1-1992.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 15 mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

The measurement together with the test system set-up is described in annex C of this test report. A detailed description of the equipment under test can be found in chapter 4 of this test report.

The highest reported SAR value is obtained at the case of **(Table 2.1),** and the values are**: 1.06 W/kg (1g).**

Table 2.2: The sum of reported SAR values for main antenna and WLAN

	Position	Main antenna	WLAN	Sum
Maximum reported SAR value for Head	Left hand, Touch cheek	0.77	0.32	**1.09**
	Right hand, Touch cheek	0.56	0.61	**1.17**
Maximum reported SAR value for Body	Rear 15mm	1.06	0.10	**1.16**
	Rear unfold 15mm	0.57	0.17	**0.74**

Table 2.3: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Left hand, Touch cheek	0.77	< 0.01	**0.77**
Maximum reported SAR value for Body	Rear 15mm	1.06	< 0.01	**1.06**

According to the above tables, the highest sum of reported SAR values is **1.17 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	TCL Communication Ltd.
Address /Post:	7/F, Block F4, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052
Contact Person:	Gong Zhizhou
E-mail:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000 ext: 81722

3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	7/F, Block F4, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052
Contact Person:	Gong Zhizhou
E-mail:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000 ext: 81722

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

4.1 About EUT

Description:	HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 5 Band Mobile Phone
Model name:	4052R
Operating mode(s):	GSM 850/900/1800/1900 WCDMA850/1700/1900 LTE B2/4/5/12/14, BT, WLAN
Tested Tx Frequency:	825 – 848.8 MHz (GSM 850)
	1850.2 – 1910 MHz (GSM 1900)
	826.4–846.6 MHz (WCDMA 850 Band V)
	1712.4 – 1752.6 MHz (WCDMA 1700 Band IV)
	1852.4–1907.6 MHz (WCDMA1900 Band II)
	1860 – 1900 MHz (LTE Band 2)
	1720 – 1745 MHz (LTE Band 4)
	824.7 – 848.3 MHz (LTE Band 5)
	699.7 – 715.3 MHz (LTE Band 12)
	790.5 –795.5 MHz (LTE Band 14)
	2412 – 2462 MHz (Wi-Fi 2.4G)
GPRS/EGPRS Multislot Class:	10
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna

4.2 Internal Identification of EUT used during the test

EUTID	IMEI	HW Version	SW Version
EUT1	**015455000008754**	**04**	**ZXXD**
EUT2	**015455000008978**	**04**	**ZXXD**
EUT3	**015455000008705**	**04**	**ZXXD**

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

Note: It is performed to test SAR with the EUT1~2 and conducted power with the EUT3.

4.3 Internal Identification of AE used during the test

AE ID	Description	Model	SN	Manufactor
AE1	Battery	CAB1350001C1	/	BYD

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

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

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

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

5.2 Applicable Measurement Standards

IEEE 1528–2013: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

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

KDB648474 D04 Handset SAR v01r03: SAR Evaluation Considerations for Wireless Handsets.

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

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

KDB248227 D01 802.11 Wi-Fi SAR v02r02: SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS

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

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

6 Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

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

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

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

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

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

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

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

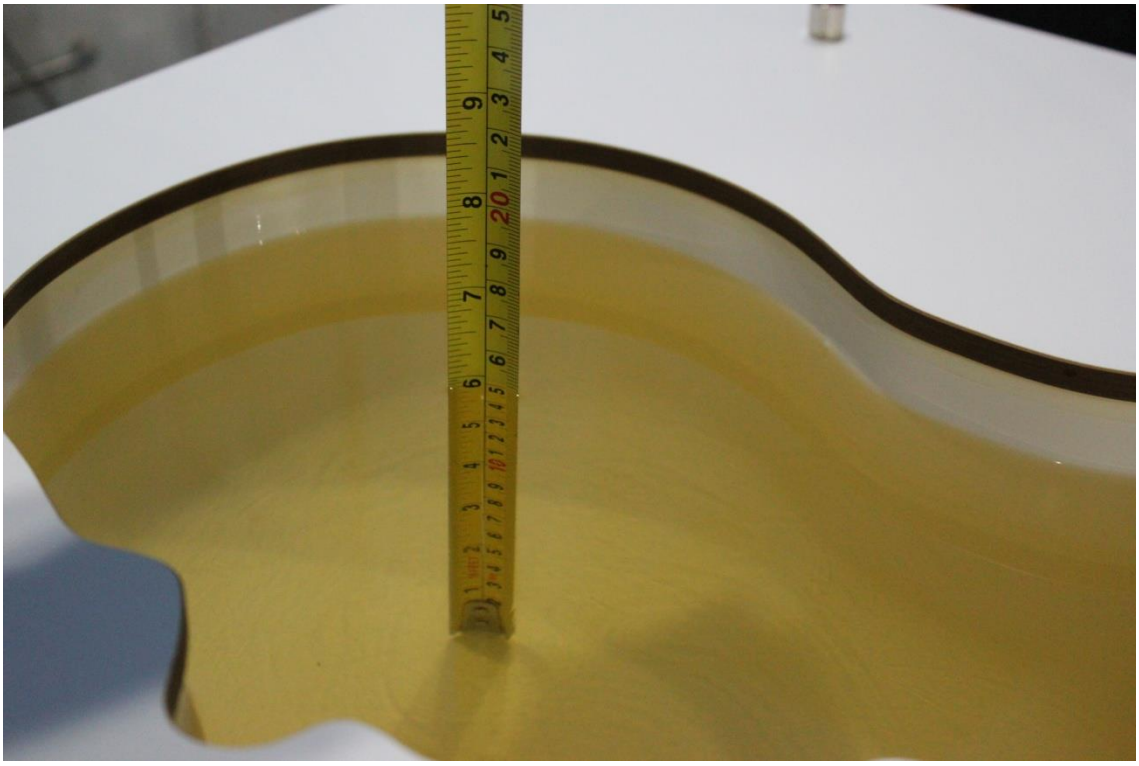
Table 7.1: Targets for tissue simulating liquid

Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
750	Body	0.96	0.91～1.01	55.5	52.7～58.3
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
835	Body	0.97	0.92～1.02	55.2	52.4～58.0
1750	Head	1.37	1.30～1.44	40.08	38.1～42.1
1750	Body	1.49	1.42～1.56	53.4	50.7～56.1
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
1900	Body	1.52	1.44～1.60	53.3	50.6～56.0
2450	Head	1.80	1.71～1.89	39.2	37.2～41.2
2450	Body	1.95	1.85～2.05	52.7	50.1～55.3

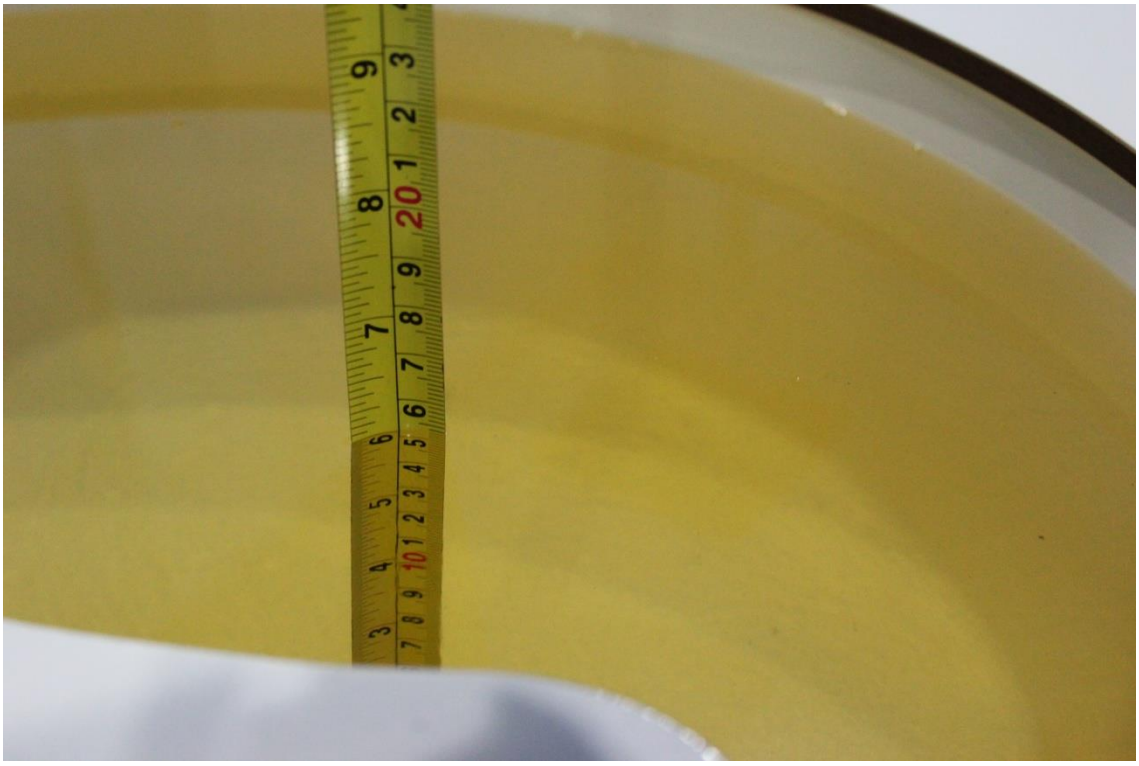
7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

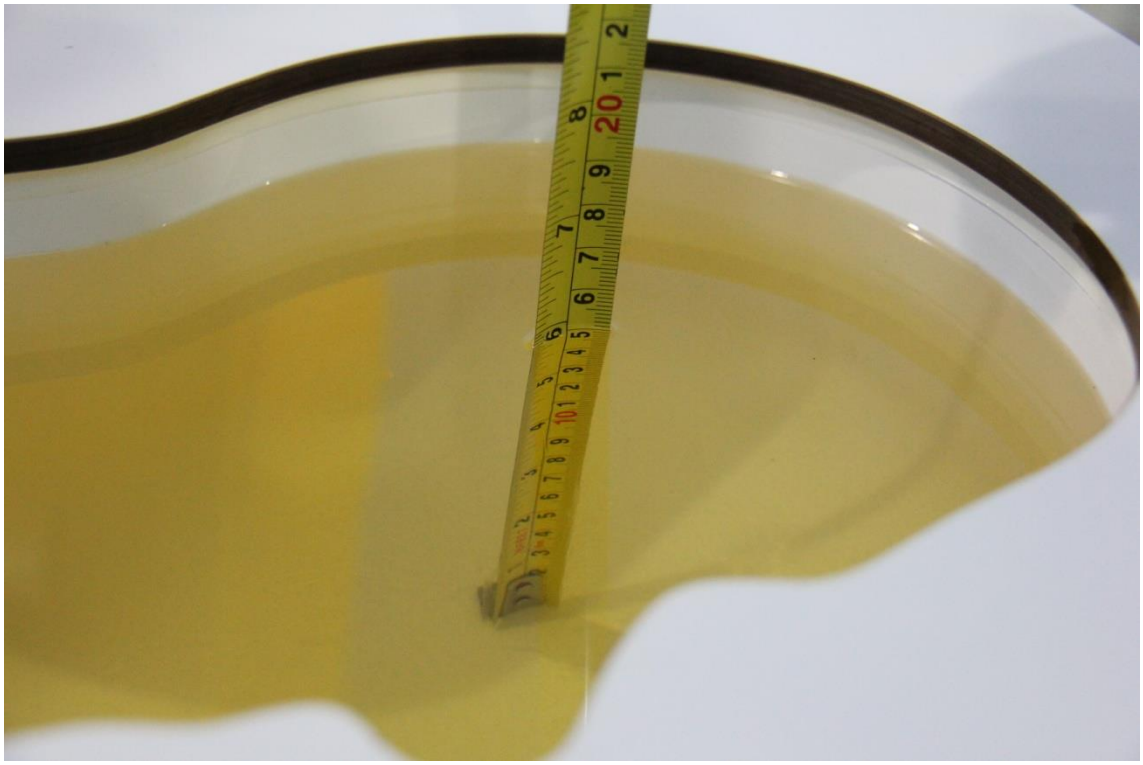
Measurement Date yyyy/mm/dd	Frequency	Type	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2019-6-14	750 MHz	Head	42.38	1.05	0.875	-1.69
		Body	54.56	-1.69	0.976	1.67
2019-6-18	835 MHz	Head	41.83	0.80	0.916	1.78
		Body	55.9	1.27	0.995	2.58
2019-6-15	1750 MHz	Head	40.49	1.02	1.386	1.17
		Body	54.4	1.87	1.456	-2.28
2019-6-19	1900 MHz	Head	40.23	0.57	1.393	-0.50
		Body	52.24	-1.99	1.547	1.78
2019-6-16	2450 MHz	Head	38.89	-0.79	1.798	-0.11
		Body	51.88	-1.56	1.923	-1.38



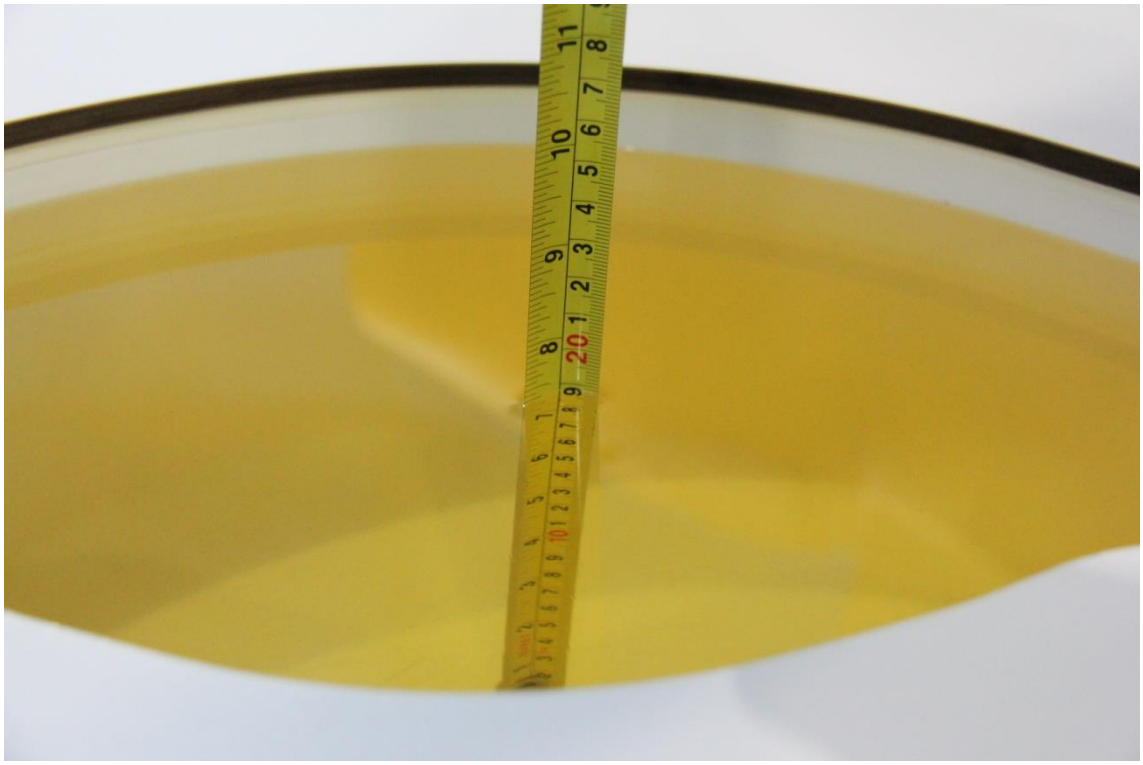
Picture 7-1 Liquid depth in the Head Phantom (750 MHz)



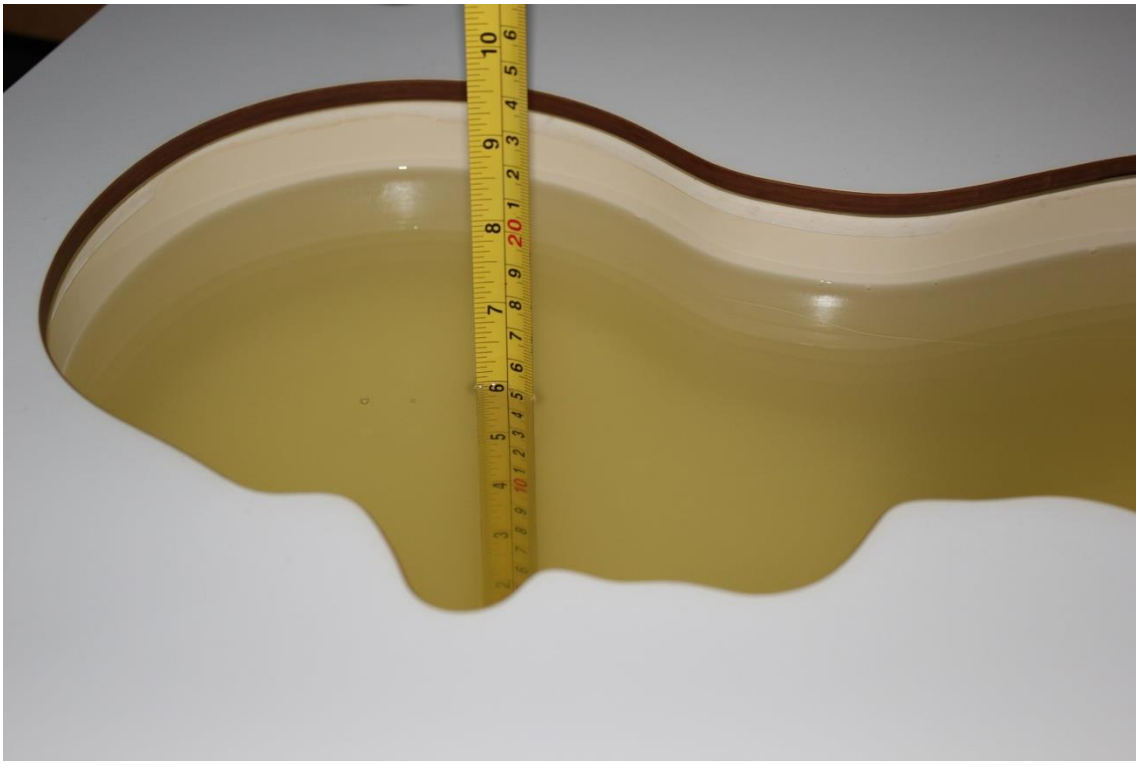
Picture 7-2 Liquid depth in the Flat Phantom (750 MHz)



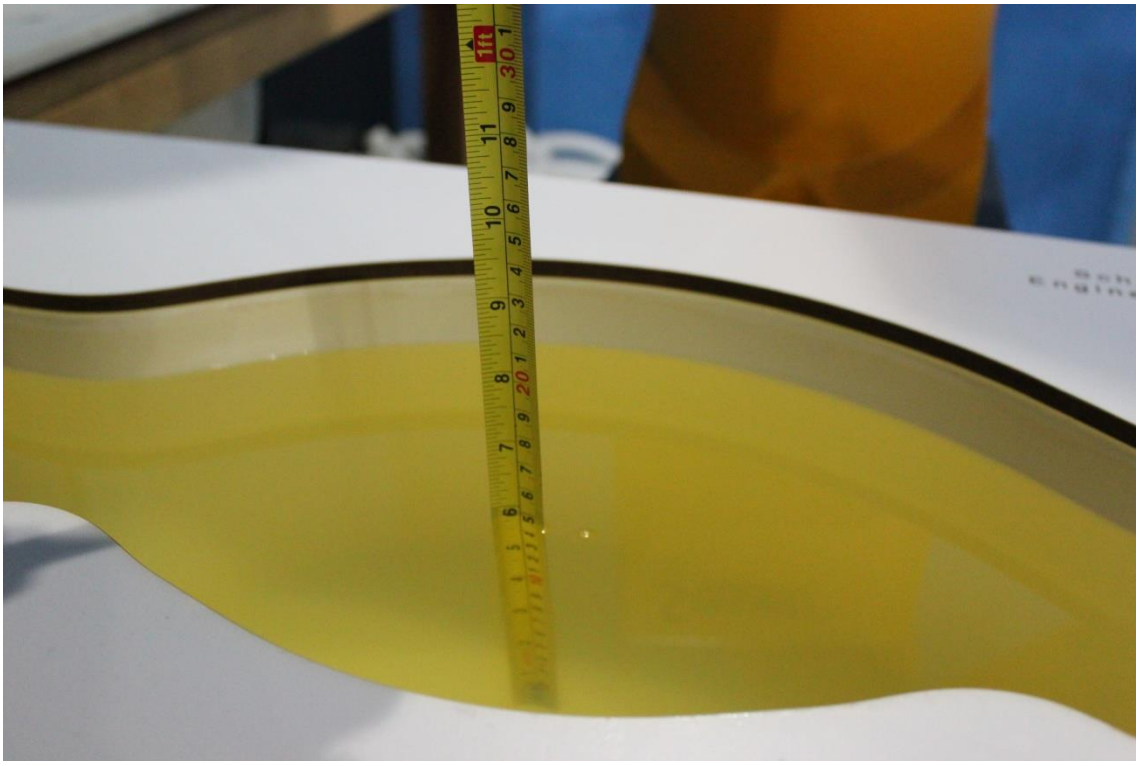
Picture 7-3 Liquid depth in the Head Phantom (835MHz)



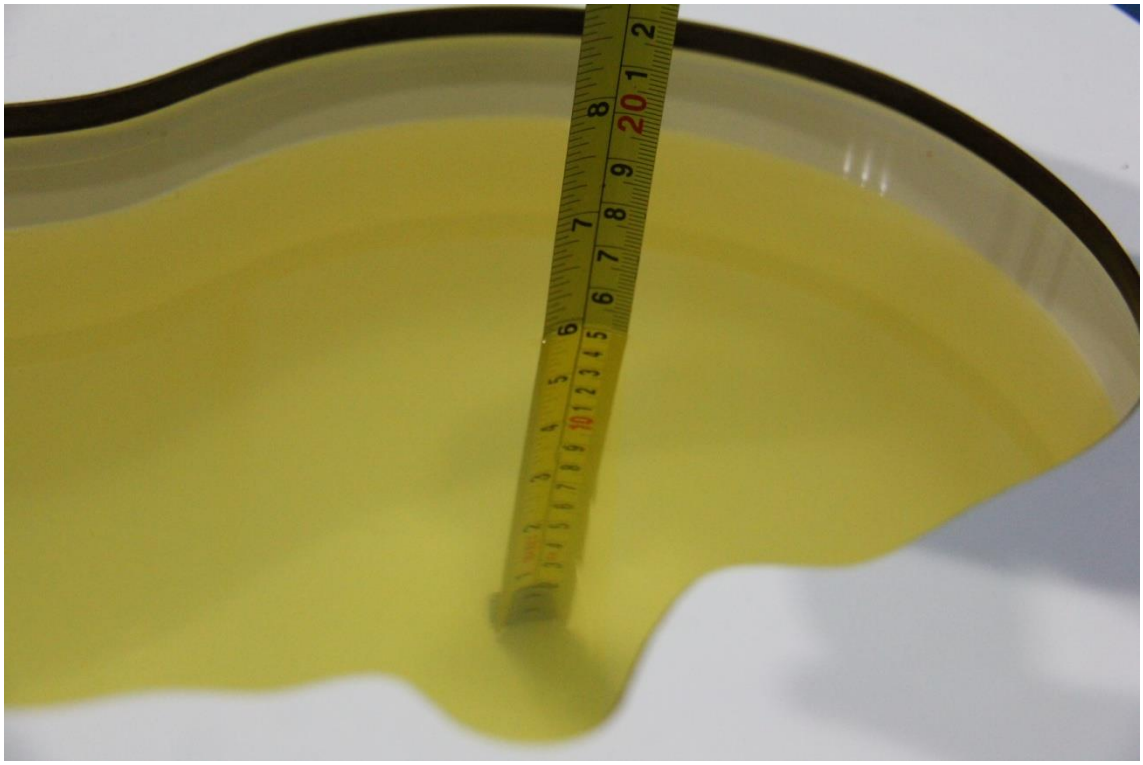
Picture 7-4 Liquid depth in the Flat Phantom (835MHz)



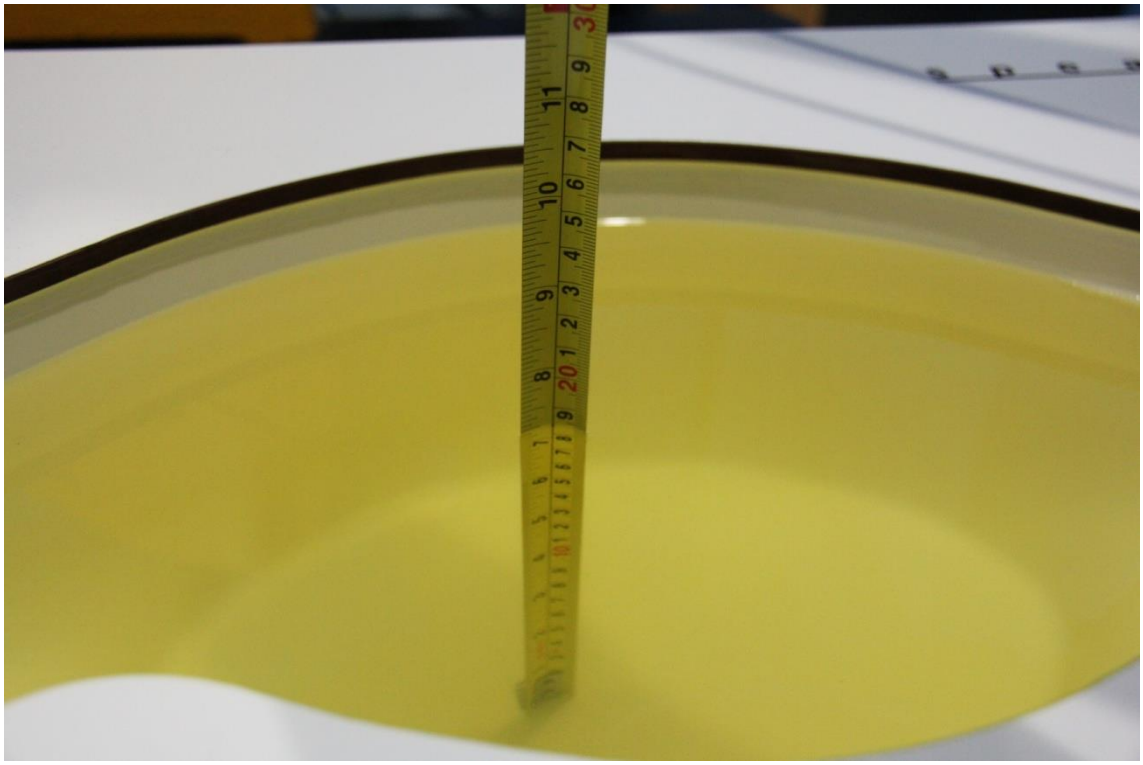
Picture 7-5 Liquid depth in the Head Phantom (1750 MHz)



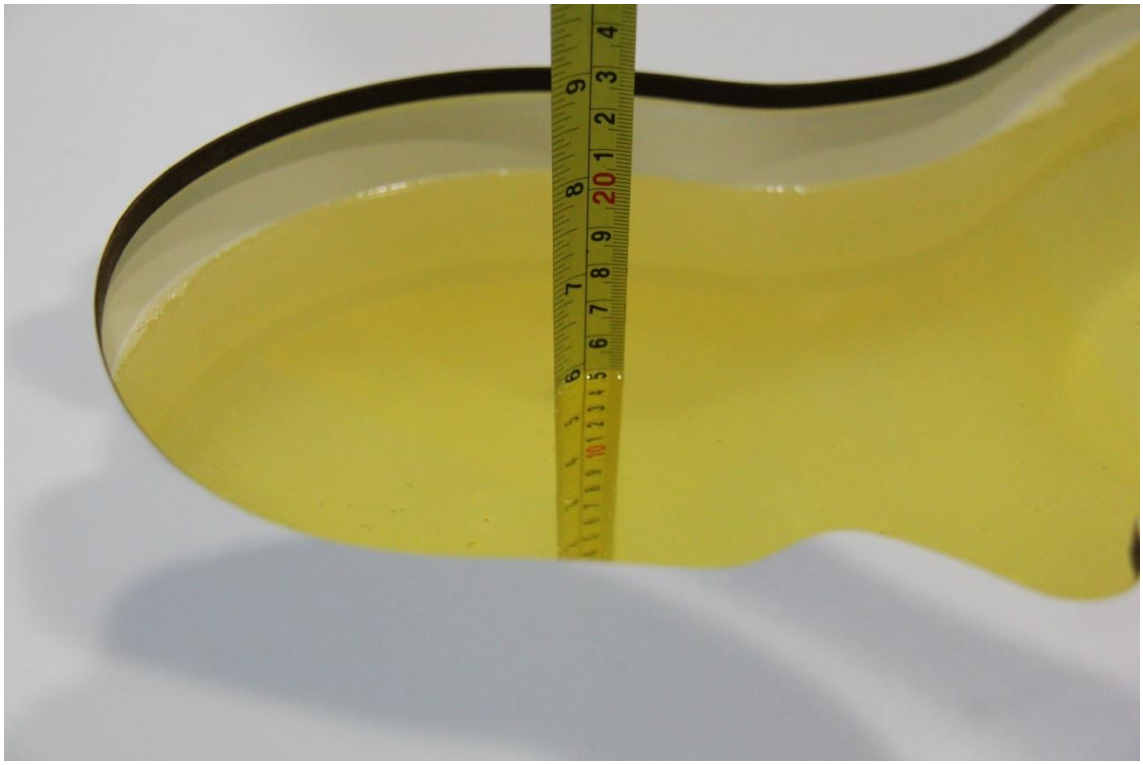
Picture 7-6 Liquid depth in the Flat Phantom (1750MHz)



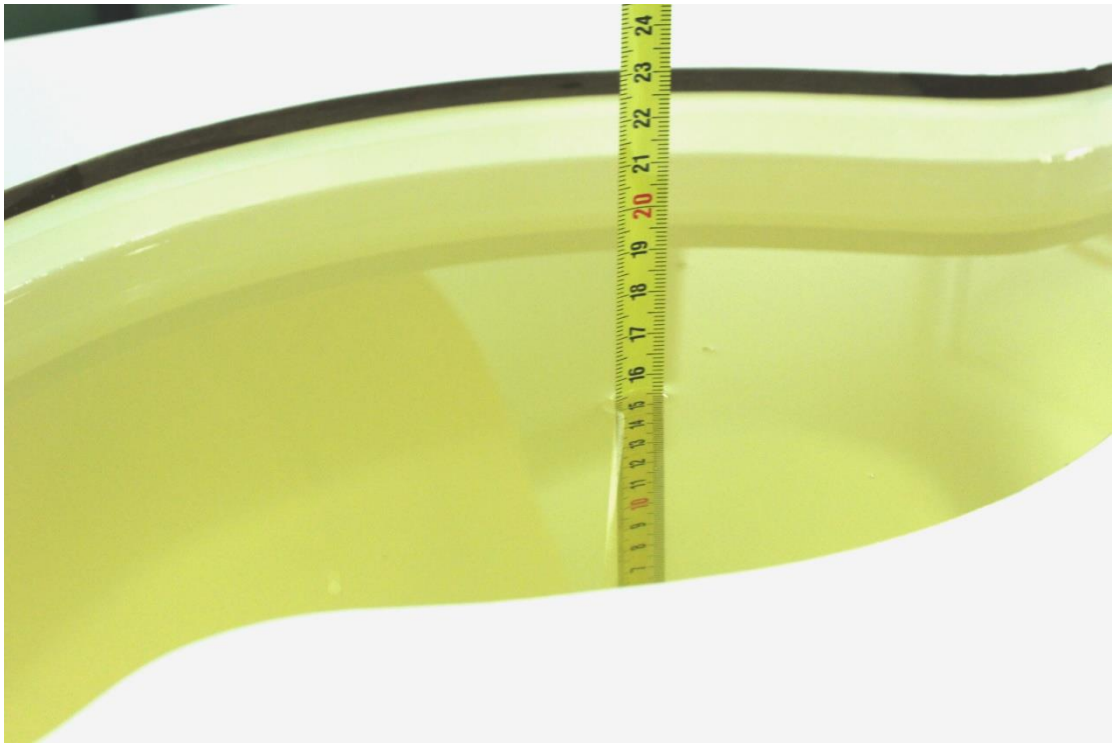
Picture 7-7 Liquid depth in the Head Phantom (1900 MHz)



Picture 7-8 Liquid depth in the Flat Phantom (1900MHz)



Picture 7-9 Liquid depth in the Head Phantom (2450MHz)

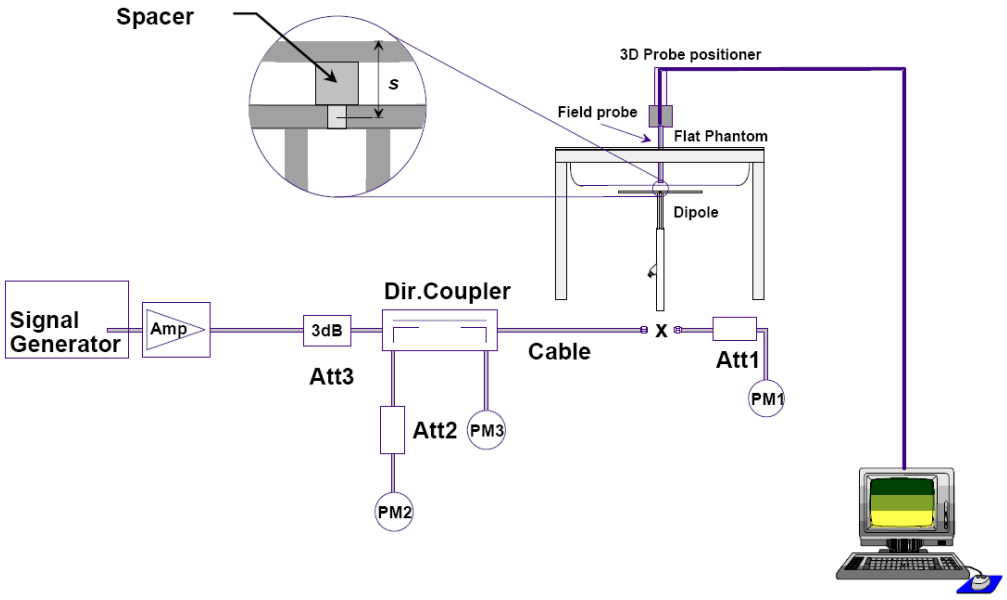


Picture 7-10 Liquid depth in the Flat Phantom (2450MHz)

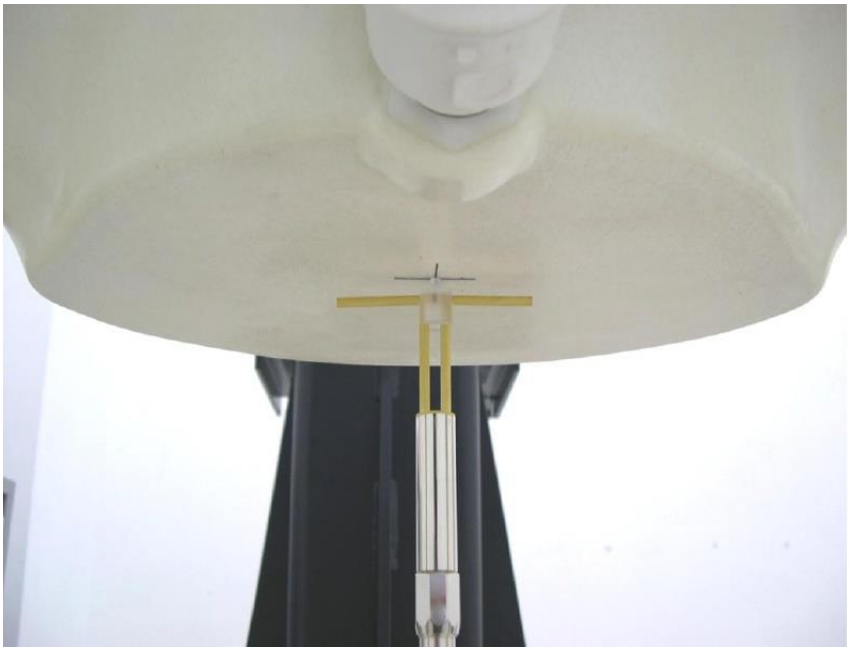
8 System verification

8.1 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 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device.

The system verification results are required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR. The details are presented in annex B.

Table 8.1: System Verification of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2019-6-14	750 MHz	5.34	8.20	5.4	8.3	1.87%	0.98%
2019-6-18	835 MHz	6.06	9.40	5.92	9.24	-2.31%	-1.70%
2019-6-15	1750 MHz	18.9	35.9	19.4	36.7	2.86%	2.28%
2019-6-19	1900 MHz	21.3	40.4	21.8	41.2	2.16%	1.98%
2019-6-16	2450 MHz	24.2	51.7	23.7	50.8	-2.15%	-1.74%

Table 8.2: System Verification of Body

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2019-6-14	750 MHz	5.68	8.63	5.76	8.76	1.41%	1.51%
2019-6-18	835 MHz	6.28	9.53	6.36	9.68	1.27%	1.57%
2019-6-15	1750 MHz	19.3	36.4	19.92	37.68	3.21%	3.52%
2019-6-19	1900 MHz	21.4	40.4	21.96	41.60	2.62%	2.97%
2019-6-16	2450 MHz	24.1	51.3	23.56	50.40	-2.24%	-1.75%

9 Measurement Procedures

9.1 Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in picture 9.1.

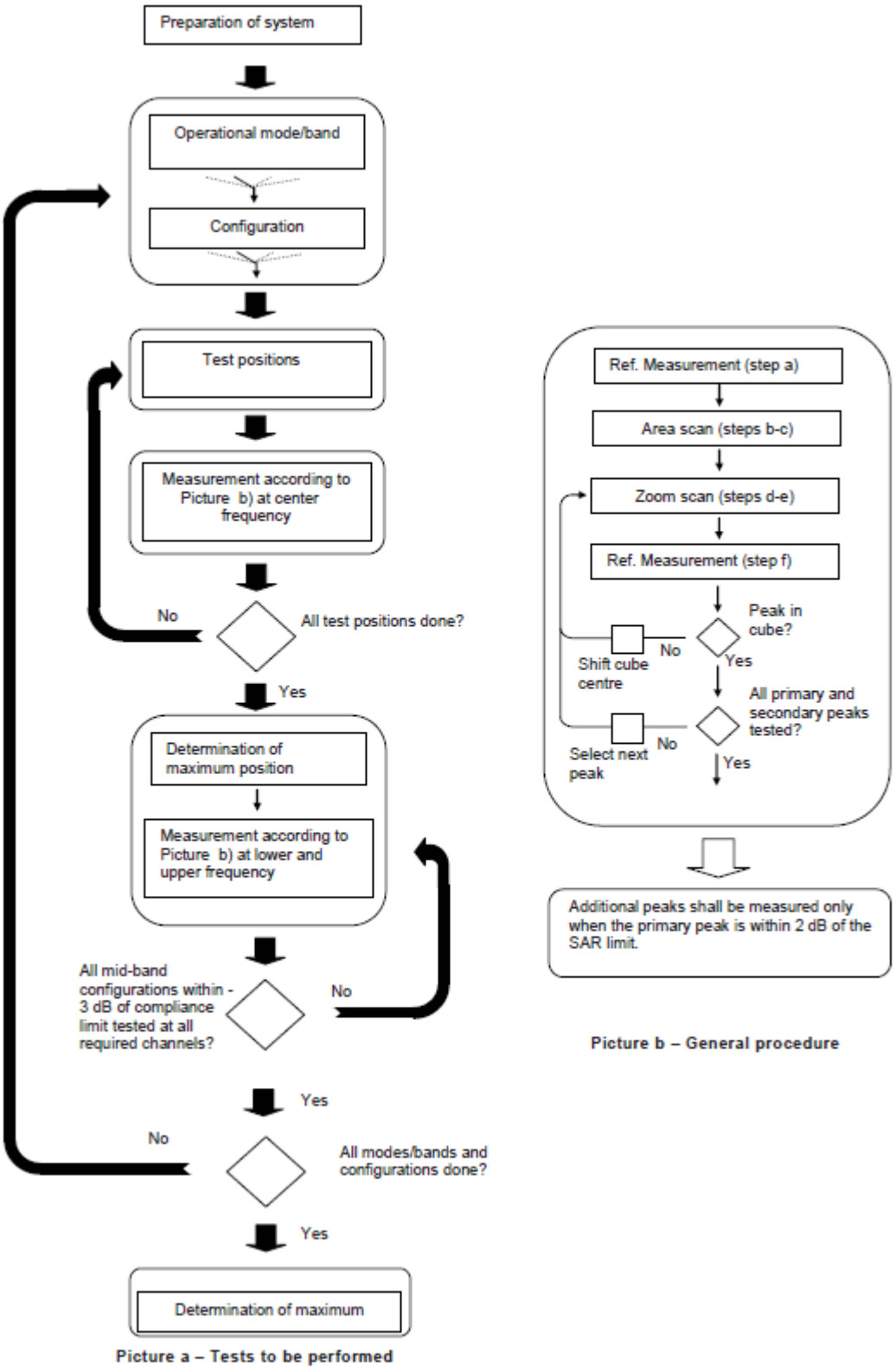
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the center of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in annex D),
b) all configurations for each device position in a), e.g., antenna extended and retracted, and
c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

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

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

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



Picture 9.1 Block diagram of the tests to be performed

9.2 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>≤ 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 ± 1 mm</td><td>½·δ·ln(2) ± 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>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 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 ≤ 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>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 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>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 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>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 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 draft standard IEEE P1528-2011 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 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 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>

9.3 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
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

For Release 6 HSPA Data Devices

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

Rel.8 DC-HSDPA (Cat 24)

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

9.4 SAR Measurement for LTE

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

1) QPSK with 1 RB allocation
   Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
2) QPSK with 50% RB allocation
   The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.
3) QPSK with 100% RB allocation
   For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

9.5 Bluetooth & Wi-Fi Measurement Procedures for SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.
Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

9.6 Power Drift

To control the output power stability during the SAR test, DASY4 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%.

10 Area Scan Based 1-g SAR

10.1 Requirement of KDB

According to the KDB447498 D01 v05, when the implementation is based the specific polynomial fit
algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007) and the estimated 1-g SAR is ≤ 1.2 W/kg, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

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

10.2 Fast SAR Algorithms

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

In the initial study, an approximation algorithm based on Linear fit was developed. The accuracy of the algorithm has been demonstrated across a broad frequency range (136-2450 MHz) and for both 1- and 10-g averaged SAR using a sample of 264 SAR measurements from 55 wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithm are 1.2% and 5.8% for 1- and 10-g averaged SAR, respectively. The paper describing the algorithm in detail is expected to be published in August 2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomial fit whereby the frequency validity was extended to cover the range 30-6000MHz. Details of this study can be found in the BEMS 2007 Proceedings.
Both algorithms are implemented in DASY software.

11 Conducted Output Power

11.1 GSM Measurement result

During the process of testing, the EUT was controlled via Agilent Digital Radio Communication tester (E5515C) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

Table 11.1-1: The conducted power measurement results for 2G

GSM 850	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
Speech (GMSK)	251	190	128			251	190	128
1 Txslot	32.95	32.85	32.72	**33.50**	/	/	/	/
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	251	190	128			251	190	128
1 Txslot	**33.01**	**32.97**	**32.82**	**33.50**	**-9.03**	**23.98**	**23.94**	**23.79**
2 Txslots	29.03	29.32	29.21	**30.00**	-6.02	23.01	23.30	23.19
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	251	190	128			251	190	128
1 Txslot	33.02	32.95	32.81	**33.50**	-9.03	**23.99**	**23.92**	**23.78**
2 Txslots	29.01	29.37	29.20	**30.00**	-6.02	22.99	23.35	23.18
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	251	190	128			251	190	128
1 Txslot	26.65	26.76	26.63	**28.00**	-9.03	17.62	17.73	17.60
2 Txslots	26.34	26.51	26.38	**27.00**	-6.02	20.32	20.49	20.36
PCS1900	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
Speech (GMSK)	810	661	512			810	661	512
1 Txslot	29.81	29.69	29.98	**31.00**	/	/	/	/
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	810	661	512			810	661	512
1 Txslot	**30.01**	**29.82**	**30.09**	**31.00**	**-9.03**	**20.98**	**20.79**	**21.06**
2 Txslots	26.55	26.77	26.71	**28.00**	-6.02	20.53	20.75	20.69
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	29.84	29.73	30.00	**31.00**	-9.03	**20.81**	**20.70**	**20.97**
2 Txslots	26.79	26.70	26.53	**28.00**	-6.02	20.77	20.68	20.51
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	26.26	26.10	26.09	**27.00**	-9.03	17.23	17.07	17.06
2 Txslots	25.11	25.03	25.07	**26.00**	-6.02	19.09	19.01	19.05

NOTES:

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

According to the conducted power as above, the body measurements are performed with 1Txslot for 850MHz and 1900MHz.

11.2 WCDMA Measurement result

Table 11.2-1: The conducted Power for WCDMA

Item	band	FDDV result			
	ARFCN	4233 (846.6MHz)	4182 (836.4MHz)	4132 (826.4MHz)	Tune up
WCDMA	\	22.99	23.03	23.08	24
HSUPA	1	21.67	21.52	21.42	23
	2	20.83	20.54	20.61	22
	3	20.62	20.14	20.38	21
	4	21.17	20.94	21.21	22
	5	21.96	21.97	22.01	23.5
Item	band	FDDII result			
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)	Tune up
WCDMA	\	23.30	23.32	23.21	24
HSUPA	1	21.71	21.58	21.56	23
	2	20.59	20.54	20.85	23
	3	20.87	20.71	20.95	22
	4	21.29	21.06	21.01	22
	5	22.17	22.22	22.13	23
Item	band	FDDIV result			
	ARFCN	1513 (1752.6MHz)	1412(1732.4MHz)	1312(1712.4MHz)	Tune up
WCDMA	\	23.12	23.34	23.32	24
HSUPA	1	21.68	21.84	21.33	23
	2	20.56	20.89	20.65	22
	3	20.67	20.50	20.59	22
	4	21.03	21.20	21.26	22
	5	22.18	22.22	22.30	23.5

11.3 LTE Measurement result

Table 11.3-1: Tune up for LTE

Band	Tune up (dBm)
Band 2	23.5
Band 4	23.5
Band 5	23.5
Band 12	23.5
Band 14	23.5

Table 11.3-2: Maximum Power Reduction (MPR) for LTE

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	2

Table 11.3-3 LTE1900-FDD2

Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
1.4MHz	1RB-High (5)	1909.3 (19193)	23.20	22.23
		1880 (18900)	23.13	22.06
		1850.7 (18607)	22.90	22.44
	1RB-Middle (3)	1909.3 (19193)	23.11	22.26
		1880 (18900)	23.13	22.13
		1850.7 (18607)	23.17	22.46
	1RB-Low (0)	1909.3 (19193)	22.91	22.20
		1880 (18900)	22.84	22.09
		1850.7 (18607)	22.71	22.46
	3RB-High (3)	1909.3 (19193)	23.13	22.47
		1880 (18900)	22.87	22.08
		1850.7 (18607)	22.79	21.91
	3RB-Middle (1)	1909.3 (19193)	23.15	22.43
		1880 (18900)	22.94	22.08
		1850.7 (18607)	22.90	21.95
	3RB-Low (0)	1909.3 (19193)	23.15	22.44
		1880 (18900)	22.85	22.10
		1850.7 (18607)	22.91	21.94
	6RB (0)	1909.3 (19193)	22.11	21.24
		1880 (18900)	21.86	21.11
		1850.7 (18607)	21.95	20.87
3MHz	1RB-High (14)	1908.5 (19185)	22.97	22.33
		1880 (18900)	22.81	21.82
		1851.5 (18615)	22.55	21.95
	1RB-Middle (7)	1908.5 (19185)	22.95	22.26
		1880 (18900)	22.85	21.80
		1851.5 (18615)	23.11	22.28
	1RB-Low (0)	1908.5 (19185)	22.89	21.41
		1880 (18900)	22.91	21.67
		1851.5 (18615)	22.67	21.97
	8RB-High (7)	1908.5 (19185)	21.96	20.86
		1880 (18900)	21.93	20.83
		1851.5 (18615)	21.87	20.69
	8RB-Middle (4)	1908.5 (19185)	21.77	20.83
		1880 (18900)	21.92	20.86
		1851.5 (18615)	21.87	20.68
	8RB-Low (0)	1908.5 (19185)	22.00	21.11
		1880 (18900)	21.82	20.89
		1851.5 (18615)	21.83	20.68
	15RB (0)	1908.5 (19185)	21.90	20.74
		1880 (18900)	21.85	20.64
		1851.5 (18615)	21.93	20.72

5MHz	1RB-High (24)	1907.5 (19175)	22.87	21.31
		1880 (18900)	22.70	21.44
		1852.5 (18625)	22.41	21.13
	1RB-Middle (12)	1907.5 (19175)	23.06	21.37
		1880 (18900)	22.81	21.08
		1852.5 (18625)	22.35	21.23
	1RB-Low (0)	1907.5 (19175)	22.85	21.02
		1880 (18900)	22.52	21.01
		1852.5 (18625)	22.23	21.15
	12RB-High (13)	1907.5 (19175)	21.62	20.70
		1880 (18900)	21.61	20.60
		1852.5 (18625)	21.53	20.48
	12RB-Middle (6)	1907.5 (19175)	21.82	20.95
		1880 (18900)	21.62	20.60
		1852.5 (18625)	21.60	20.56
	12RB-Low (0)	1907.5 (19175)	21.66	20.81
		1880 (18900)	21.53	20.61
		1852.5 (18625)	21.62	20.58
	25RB (0)	1907.5 (19175)	21.68	20.83
		1880 (18900)	21.57	20.64
		1852.5 (18625)	21.56	20.55

10MHz	1RB-High (49)	1905 (19150)	23.16	22.15
		1880 (18900)	22.72	21.99
		1855 (18650)	22.80	22.24
	1RB-Middle (24)	1905 (19150)	23.44	22.39
		1880 (18900)	22.88	21.99
		1855 (18650)	22.60	21.91
	1RB-Low (0)	1905 (19150)	22.19	22.12
		1880 (18900)	22.77	21.66
		1855 (18650)	22.64	22.11
	25RB-High (25)	1905 (19150)	22.20	21.04
		1880 (18900)	22.00	20.85
		1855 (18650)	21.75	20.93
	25RB-Middle (12)	1905 (19150)	22.04	20.92
		1880 (18900)	21.99	20.83
		1855 (18650)	21.97	20.75
	25RB-Low (0)	1905 (19150)	22.05	20.97
		1880 (18900)	22.05	20.76
		1855 (18650)	21.96	20.68
	50RB (0)	1905 (19150)	22.03	20.90
		1880 (18900)	21.94	20.72
		1855 (18650)	22.03	20.69

15MHz	1RB-High (74)	1902.5 (19125)	23.42	22.22
		1880 (18900)	22.87	21.65
		1857.5 (18675)	22.51	21.73
	1RB-Middle (37)	1902.5 (19125)	23.37	22.15
		1880 (18900)	23.07	21.22
		1857.5 (18675)	23.16	22.10
	1RB-Low (0)	1902.5 (19125)	23.11	22.46
		1880 (18900)	22.66	21.24
		1857.5 (18675)	22.62	21.55
	36RB-High (38)	1902.5 (19125)	22.04	20.84
		1880 (18900)	21.73	20.80
		1857.5 (18675)	21.63	20.59
	36RB-Middle (19)	1902.5 (19125)	21.93	20.75
		1880 (18900)	21.73	20.82
		1857.5 (18675)	21.79	20.54
	36RB-Low (0)	1902.5 (19125)	21.87	20.72
		1880 (18900)	21.63	20.77
		1857.5 (18675)	21.62	20.50
	75RB (0)	1902.5 (19125)	21.99	20.75
		1880 (18900)	21.73	20.72
		1857.5 (18675)	21.71	20.59

20MHz	1RB-High (99)	1900 (19100)	23.12	22.07
		1880 (18900)	23.24	21.89
		1860 (18700)	22.85	21.48
	1RB-Middle (50)	1900 (19100)	23.42	21.80
		1880 (18900)	23.49	22.16
		1860 (18700)	23.41	21.89
	1RB-Low (0)	1900 (19100)	22.97	21.60
		1880 (18900)	22.94	21.95
		1860 (18700)	22.56	21.72
	50RB-High (50)	1900 (19100)	22.18	20.98
		1880 (18900)	22.14	20.84
		1860 (18700)	21.81	20.59
	50RB-Middle (25)	1900 (19100)	22.24	21.13
		1880 (18900)	22.16	20.87
		1860 (18700)	22.00	20.71
	50RB-Low (0)	1900 (19100)	22.19	21.08
		1880 (18900)	21.97	20.79
		1860 (18700)	21.96	20.65
	100RB (0)	1900 (19100)	22.13	21.01
		1880 (18900)	22.15	20.86
		1860 (18700)	21.93	20.76

Table 11.3-4 LTE1700-FDD4

Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
1.4MHz	1RB-High (5)	1754.3 (20393)	22.91	21.89
		1732.5 (20175)	22.92	21.92
		1710.7 (19957)	22.97	22.30
	1RB-Middle (3)	1754.3 (20393)	22.88	21.74
		1732.5 (20175)	22.98	21.98
		1710.7 (19957)	23.35	22.26
	1RB-Low (0)	1754.3 (20393)	22.91	21.61
		1732.5 (20175)	22.97	21.94
		1710.7 (19957)	22.91	22.15
	3RB-High (3)	1754.3 (20393)	22.56	21.64
		1732.5 (20175)	22.92	21.86
		1710.7 (19957)	22.93	21.89
	3RB-Middle (1)	1754.3 (20393)	22.76	21.58
		1732.5 (20175)	22.95	21.91
		1710.7 (19957)	23.13	21.93
	3RB-Low (0)	1754.3 (20393)	22.70	21.95
		1732.5 (20175)	22.91	21.47
		1710.7 (19957)	23.06	21.99
	6RB (0)	1754.3 (20393)	21.82	21.00
		1732.5 (20175)	21.89	21.45
		1710.7 (19957)	21.92	20.77
3MHz	1RB-High (14)	1753.5 (20385)	23.04	21.66
		1732.5 (20175)	23.31	21.24
		1711.5 (19965)	22.81	21.96
	1RB-Middle (7)	1753.5 (20385)	22.99	21.69
		1732.5 (20175)	23.40	21.44
		1711.5 (19965)	23.19	21.94
	1RB-Low (0)	1753.5 (20385)	23.03	21.69
		1732.5 (20175)	23.20	21.36
		1711.5 (19965)	23.11	21.85
	8RB-High (7)	1753.5 (20385)	21.83	20.91
		1732.5 (20175)	21.98	21.10
		1711.5 (19965)	21.96	20.77
	8RB-Middle (4)	1753.5 (20385)	21.75	20.95
		1732.5 (20175)	22.02	20.94
		1711.5 (19965)	21.93	20.95
	8RB-Low (0)	1753.5 (20385)	21.73	20.84
		1732.5 (20175)	22.05	21.06
		1711.5 (19965)	21.96	20.98
	15RB (0)	1753.5 (20385)	21.84	20.77
		1732.5 (20175)	22.02	21.22
		1711.5 (19965)	21.92	20.84

5MHz	1RB-High (24)	1752.5 (20375)	22.89	21.31
		1732.5 (20175)	23.31	21.11
		1712.5 (19975)	22.98	21.58
	1RB-Middle (12)	1752.5 (20375)	22.93	21.30
		1732.5 (20175)	23.41	21.18
		1712.5 (19975)	23.11	21.33
	1RB-Low (0)	1752.5 (20375)	22.97	21.32
		1732.5 (20175)	23.29	21.29
		1712.5 (19975)	22.83	21.29
	12RB-High (13)	1752.5 (20375)	21.99	20.90
		1732.5 (20175)	22.18	20.96
		1712.5 (19975)	21.97	20.87
	12RB-Middle (6)	1752.5 (20375)	21.99	20.93
		1732.5 (20175)	22.28	21.17
		1712.5 (19975)	22.08	20.97
	12RB-Low (0)	1752.5 (20375)	21.97	21.01
		1732.5 (20175)	22.12	21.17
		1712.5 (19975)	21.95	21.03
	25RB (0)	1752.5 (20375)	21.95	20.91
		1732.5 (20175)	22.05	21.17
		1712.5 (19975)	21.94	20.99

10MHz	1RB-High (49)	1750 (20350)	23.14	21.77
		1732.5 (20175)	23.10	21.95
		1715 (20000)	23.16	22.27
	1RB-Middle (24)	1750 (20350)	22.99	21.94
		1732.5 (20175)	23.45	22.41
		1715 (20000)	23.40	21.82
	1RB-Low (0)	1750 (20350)	23.28	21.49
		1732.5 (20175)	23.17	21.94
		1715 (20000)	22.92	22.21
	25RB-High (25)	1750 (20350)	21.85	20.88
		1732.5 (20175)	21.87	20.89
		1715 (20000)	21.87	21.05
	25RB-Middle (12)	1750 (20350)	21.80	21.03
		1732.5 (20175)	22.04	20.96
		1715 (20000)	21.96	21.10
	25RB-Low (0)	1750 (20350)	21.96	21.11
		1732.5 (20175)	21.90	20.83
		1715 (20000)	21.86	20.93
	50RB (0)	1750 (20350)	21.89	20.89
		1732.5 (20175)	21.82	20.97
		1715 (20000)	21.91	20.99

15MHz	1RB-High (74)	1747.5 (20325)	23.09	22.32
		1732.5 (20175)	23.30	22.09
		1717.5 (20025)	23.34	21.31
	1RB-Middle (37)	1747.5 (20325)	23.19	22.46
		1732.5 (20175)	23.21	22.44
		1717.5 (20025)	22.94	21.46
	1RB-Low (0)	1747.5 (20325)	23.00	22.42
		1732.5 (20175)	23.22	22.02
		1717.5 (20025)	22.89	22.14
	36RB-High (38)	1747.5 (20325)	22.03	21.02
		1732.5 (20175)	22.07	21.14
		1717.5 (20025)	22.03	21.09
	36RB-Middle (19)	1747.5 (20325)	22.24	21.09
		1732.5 (20175)	22.15	21.12
		1717.5 (20025)	22.02	21.22
	36RB-Low (0)	1747.5 (20325)	22.01	21.10
		1732.5 (20175)	21.98	20.95
		1717.5 (20025)	22.02	21.12
	75RB (0)	1747.5 (20325)	22.08	20.99
		1732.5 (20175)	22.12	20.89
		1717.5 (20025)	22.08	21.15

20MHz	1RB-High (99)	1745 (20300)	23.01	21.36
		1732.5 (20175)	22.62	21.39
		1720 (20050)	23.05	21.82
	1RB-Middle (50)	1745 (20300)	23.46	21.97
		1732.5 (20175)	23.17	21.93
		1720 (20050)	23.22	21.76
	1RB-Low (0)	1745 (20300)	23.06	21.96
		1732.5 (20175)	22.84	21.54
		1720 (20050)	22.93	21.78
	50RB-High (50)	1745 (20300)	22.06	20.95
		1732.5 (20175)	22.00	21.05
		1720 (20050)	22.26	21.22
	50RB-Middle (25)	1745 (20300)	22.30	21.28
		1732.5 (20175)	22.17	21.15
		1720 (20050)	22.26	21.28
	50RB-Low (0)	1745 (20300)	22.26	21.25
		1732.5 (20175)	22.14	21.13
		1720 (20050)	22.07	20.88
	100RB (0)	1745 (20300)	22.14	21.13
		1732.5 (20175)	22.05	21.19
		1720 (20050)	22.26	21.18

Table 11.3-5 LTE850-FDD5

Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
1.4MHz	1RB-High (5)	848.3 (20643)	23.01	22.01
		836.5 (20525)	23.05	21.94
		824.7 (20407)	22.79	22.06
	1RB-Middle (3)	848.3 (20643)	22.91	21.87
		836.5 (20525)	23.09	21.93
		824.7 (20407)	22.99	22.04
	1RB-Low (0)	848.3 (20643)	22.88	21.76
		836.5 (20525)	23.01	21.89
		824.7 (20407)	22.85	22.01
	3RB-High (3)	848.3 (20643)	22.95	22.10
		836.5 (20525)	23.05	22.02
		824.7 (20407)	22.81	21.32
	3RB-Middle (1)	848.3 (20643)	22.93	22.30
		836.5 (20525)	22.97	22.01
		824.7 (20407)	22.81	21.70
	3RB-Low (0)	848.3 (20643)	23.06	22.21
		836.5 (20525)	22.90	21.93
		824.7 (20407)	22.86	21.63
	6RB (0)	848.3 (20643)	22.13	21.04
		836.5 (20525)	21.85	21.25
		824.7 (20407)	21.90	20.66
3MHz	1RB-High (14)	847.5 (20635)	23.13	22.15
		836.5 (20525)	22.87	22.04
		825.5 (20415)	22.98	21.51
	1RB-Middle (7)	847.5 (20635)	23.11	22.22
		836.5 (20525)	22.92	22.20
		825.5 (20415)	22.98	21.65
	1RB-Low (0)	847.5 (20635)	22.99	22.10
		836.5 (20525)	22.89	22.07
		825.5 (20415)	22.94	22.30
	8RB-High (7)	847.5 (20635)	22.29	20.90
		836.5 (20525)	21.95	20.91
		825.5 (20415)	21.89	20.95
	8RB-Middle (4)	847.5 (20635)	22.26	20.91
		836.5 (20525)	22.19	21.26
		825.5 (20415)	22.02	21.04
	8RB-Low (0)	847.5 (20635)	22.23	20.88
		836.5 (20525)	22.00	21.30
		825.5 (20415)	21.97	21.04
	15RB (0)	847.5 (20635)	22.09	21.09
		836.5 (20525)	22.07	21.22
		825.5 (20415)	21.91	20.95

5MHz	1RB-High (24)	846.5 (20625)	23.03	21.57
		836.5 (20525)	22.78	21.51
		826.5 (20425)	22.97	21.65
	1RB-Middle (12)	846.5 (20625)	23.24	21.83
		836.5 (20525)	23.18	21.47
		826.5 (20425)	23.09	21.68
	1RB-Low (0)	846.5 (20625)	22.93	21.62
		836.5 (20525)	22.92	21.35
		826.5 (20425)	22.96	21.50
	12RB-High (13)	846.5 (20625)	22.13	21.18
		836.5 (20525)	21.88	20.99
		826.5 (20425)	21.99	20.85
	12RB-Middle (6)	846.5 (20625)	22.07	21.14
		836.5 (20525)	22.00	21.10
		826.5 (20425)	21.91	20.79
	12RB-Low (0)	846.5 (20625)	21.98	21.06
		836.5 (20525)	21.94	21.04
		826.5 (20425)	21.90	20.65
	25RB (0)	846.5 (20625)	22.21	21.11
		836.5 (20525)	21.91	21.16
		826.5 (20425)	21.83	20.93

10MHz	1RB-High (49)	844 (20600)	23.25	22.20
		836.5 (20525)	22.96	22.18
		829 (20450)	22.79	21.58
	1RB-Middle (24)	844 (20600)	23.28	22.39
		836.5 (20525)	23.15	22.26
		829 (20450)	23.15	21.71
	1RB-Low (0)	844 (20600)	22.85	21.84
		836.5 (20525)	22.90	21.96
		829 (20450)	22.81	21.32
	25RB-High (25)	844 (20600)	22.22	21.37
		836.5 (20525)	22.03	21.05
		829 (20450)	22.08	21.12
	25RB-Middle (12)	844 (20600)	22.16	21.23
		836.5 (20525)	22.13	21.26
		829 (20450)	22.11	21.29
	25RB-Low (0)	844 (20600)	22.06	21.13
		836.5 (20525)	21.95	21.21
		829 (20450)	21.91	21.13
	50RB (0)	844 (20600)	22.16	21.18
		836.5 (20525)	22.04	21.10
		829 (20450)	22.10	21.10

Table 11.3-6 LTE700-FDD12

Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
1.4MHz	1RB-High (5)	715.3	22.93	22.11
		707.5	22.95	21.73
		699.7	23.03	22.04
	1RB-Middle (3)	715.3	23.18	22.10
		707.5	22.84	21.56
		699.7	23.18	22.18
	1RB-Low (0)	715.3	23.06	22.15
		707.5	22.76	21.66
		699.7	22.97	22.22
	3RB-High (3)	715.3	22.98	22.21
		707.5	22.97	21.42
		699.7	23.04	21.76
	3RB-Middle (1)	715.3	23.18	22.34
		707.5	23.02	21.43
		699.7	23.28	21.94
	3RB-Low (0)	715.3	23.05	22.33
		707.5	22.98	21.51
		699.7	23.22	21.97
	6RB (0)	715.3	22.04	21.46
		707.5	21.78	20.91
		699.7	21.98	20.72
3MHz	1RB-High (14)	714.5	22.83	21.98
		707.5	23.16	22.31
		700.5	22.93	22.24
	1RB-Middle (7)	714.5	23.22	22.06
		707.5	22.96	21.93
		700.5	23.17	22.36
	1RB-Low (0)	714.5	23.14	22.20
		707.5	22.82	21.68
		700.5	23.00	21.61
	8RB-High (7)	714.5	22.02	20.75
		707.5	21.77	21.27
		700.5	21.86	21.07
	8RB-Middle (4)	714.5	22.01	20.95
		707.5	21.72	21.22
		700.5	21.98	21.12
	8RB-Low (0)	714.5	22.11	20.99
		707.5	21.76	20.80
		700.5	22.06	21.10
	15RB (0)	714.5	22.05	20.91
		707.5	22.03	20.89
		700.5	21.92	21.02

5MHz	1RB-High (24)	713.5	22.79	21.24
		707.5	23.22	21.90
		701.5	22.55	21.64
	1RB-Middle (12)	713.5	23.04	21.82
		707.5	23.17	21.31
		701.5	22.81	21.75
	1RB-Low (0)	713.5	22.81	21.69
		707.5	23.01	21.20
		701.5	22.79	22.00
	12RB-High (13)	713.5	21.90	20.88
		707.5	21.97	20.70
		701.5	22.02	20.85
	12RB-Middle (6)	713.5	22.03	20.89
		707.5	21.78	20.81
		701.5	22.00	20.93
	12RB-Low (0)	713.5	21.98	20.93
		707.5	21.71	20.93
		701.5	22.15	21.27
	25RB (0)	713.5	21.89	21.02
		707.5	21.97	21.13
		701.5	21.99	20.92

10MHz	1RB-High (49)	711	23.10	21.99
		707.5	23.00	22.43
		704	23.17	22.32
	1RB-Middle (24)	711	23.08	21.65
		707.5	23.04	22.42
		704	23.33	22.44
	1RB-Low (0)	711	22.91	21.22
		707.5	23.00	21.86
		704	23.10	22.06
	25RB-High (25)	711	22.04	21.10
		707.5	21.88	21.08
		704	21.81	20.83
	25RB-Middle (12)	711	21.98	21.11
		707.5	21.70	20.89
		704	21.86	20.91
	25RB-Low (0)	711	21.80	20.93
		707.5	21.80	21.12
		704	21.93	21.04
	50RB (0)	711	21.85	20.97
		707.5	21.89	20.86
		704	21.97	21.07

Table 11.3-7 LTE700-FDD14

Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
5MHz	1RB-High (24)	795.5 (23355)	23.10	22.01
		793 (23330)	23.44	22.19
		790.5 (23305)	23.24	21.80
	1RB-Middle (12)	795.5 (23355)	23.45	22.11
		793 (23330)	23.43	22.05
		790.5 (23305)	23.44	22.10
	1RB-Low (0)	795.5 (23355)	23.44	22.06
		793 (23330)	23.35	21.99
		790.5 (23305)	23.14	22.08
	12RB-High (13)	795.5 (23355)	22.49	21.45
		793 (23330)	22.46	21.47
		790.5 (23305)	22.35	21.24
	12RB-Middle (6)	795.5 (23355)	22.40	21.37
		793 (23330)	22.44	21.34
		790.5 (23305)	22.38	21.26
	12RB-Low (0)	795.5 (23355)	22.44	21.27
		793 (23330)	22.35	21.47
		790.5 (23305)	22.20	21.16
	25RB (0)	795.5 (23355)	22.31	21.47
		793 (23330)	22.46	21.46
		790.5 (23305)	22.29	21.26
10MHz	1RB-High (49)	793 (23330)	23.47	22.07
	1RB-Middle (24)	793 (23330)	23.45	22.49
	1RB-Low (0)	793 (23330)	23.23	21.95
	25RB-High (25)	793 (23330)	22.47	21.44
	25RB-Middle (12)	793 (23330)	22.41	21.43
	25RB-Low (0)	793 (23330)	22.36	21.41
	50RB (0)	793 (23330)	22.48	21.49

11.4 Wi-Fi and BT Measurement result

The maximum output power of BT antenna is 11.49dBm.
The maximum tune up of BT antenna is 12dBm.

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

Table 11.4-1 WLAN2450 –Low Power

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
11			15.72	
6	16.38	16.27	16.41	16.30
1			15.76	
Tune up	**17.5**	**17.5**	**17.5**	**17.5**

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
11	13.92							
6	14.34	14.29	14.26	14.24	14.19	14.16	14.13	14.12
1	14.12							
Tune up	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**

802.11n（dBm）- HT20

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
11	13.96							
6	14.25	14.22	14.20	14.15	14.13	14.11	14.10	14.08
1	14.10							
Tune up	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**	**15.5**

Table 11.4-3 WLAN2450 –Normal Power

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
11			18.55	
6	18.80	18.75	18.99	18.96
1			18.94	
Tune up	**19**	**19**	**19**	**19**

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
11	16.80							
6	17.11	17.09	17.07	17.05	17.01	16.98	16.96	16.05
1	16.95							
Tune up	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**

802.11n（dBm）- HT20

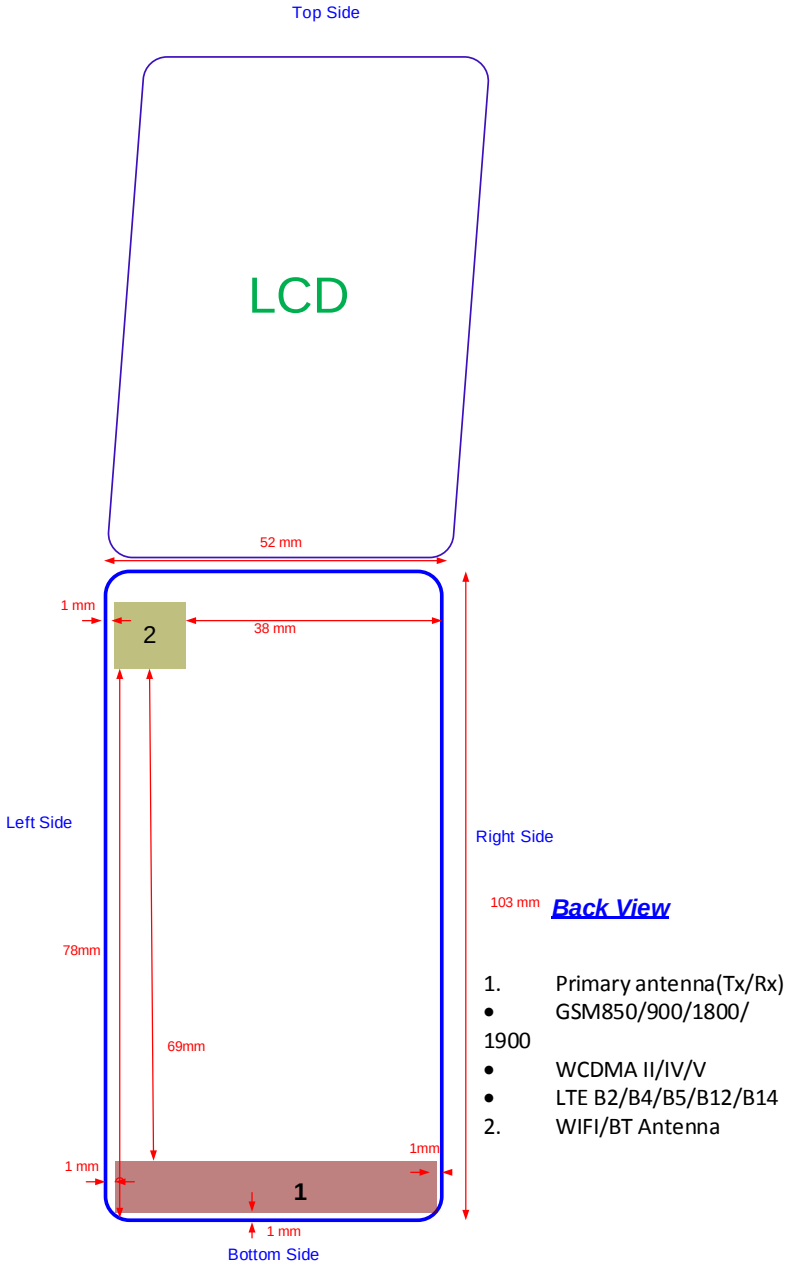
Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
11	16.79							
6	17.02	17.00	16.99	16.96	16.93	16.46	15.58	14.19
1	16.89							
Tune up	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**16**	**16**

12 Simultaneous TX SAR Considerations

12.1 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 Wi-Fi can transmit simultaneous with other transmitters.

12.2 Transmit Antenna Separation Distances



Picture 12.1 Antenna Locations

12.3 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

Table 12.1: Standalone SAR test exclusion considerations

Band/Mode	F(GHz)	Position	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.441	Head	9.6	12	15.85	No
		Body	19.2	12	15.85	Yes
2.4GHz WLAN 802.11 b	2.45	Head	9.58	17.5	56.23	No
		Body	19.17	19	79.43	No

The Bluetooth is tested with DASY system for head and body.
Both head SAR and body SAR are less than 0.01W/kg.

13 Evaluation of Simultaneous

Table 13.1: The sum of reported SAR values for main antenna and WLAN

	Position	Main antenna	WLAN	Sum
Maximum reported SAR value for Head	Left hand, Touch cheek	0.77	0.32	**1.09**
	Right hand, Touch cheek	0.56	0.61	**1.17**
Maximum reported SAR value for Body	Rear 15mm	1.06	0.10	**1.16**
	Rear unfold 15mm	0.57	0.17	**0.74**

Table 13.2: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Left hand, Touch cheek	0.77	< 0.01	**0.77**
Maximum reported SAR value for Body	Rear 15mm	1.06	< 0.01	**1.06**

Conclusion:

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

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 15mm and just applied to the condition of body worn accessory.
It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-g SAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.
The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target}-P_{Measured})/10}$$

Where P_{Target} is the power of manufacturing upper limit;
$P_{Measured}$ is the measured power in chapter 11.

Mode	Duty Cycle
Speech for GSM850/1900	1:8.3
GPRS&EGPRS for GSM850/1900	1:8.3
WCDMA&LTE	1:1

14.1 SAR results

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	Left	Touch	/	32.97	33.50	0.151	0.17	0.263	0.30	-0.12
190	836.6	Left	Tilt	/	32.97	33.50	0.087	0.10	0.114	0.13	0.09
251	848.8	Right	Touch	/	33.01	33.50	0.262	0.29	0.41	0.46	-0.09
190	836.6	Right	Touch	Fig.1	32.97	33.50	0.270	0.31	0.420	0.47	0.01
128	824.2	Right	Touch	/	32.82	33.50	0.239	0.28	0.366	0.43	0.04
190	836.6	Right	Tilt	/	32.97	33.50	0.095	0.11	0.122	0.14	0.05

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	GPRS (1)	Front	/	32.97	33.50	0.047	0.05	0.061	0.07	0.10
251	848.8	GPRS (1)	Rear	Fig.2	33.01	33.50	0.168	0.19	0.238	0.27	-0.01
190	836.6	GPRS (1)	Rear	/	32.97	33.50	0.137	0.15	0.204	0.23	0.05
128	824.2	GPRS (1)	Rear	/	32.82	33.50	0.101	0.12	0.151	0.18	-0.11
190	836.6	GPRS (1)	Rear unfold	/	32.97	33.50	0.116	0.13	0.166	0.19	0.13
251	848.8	EGPRS (1)	Rear	/	33.02	33.50	0.164	0.18	0.234	0.26	-0.05

Note: The distance between the EUT and the phantom bottom is 15mm.

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
810	1909.8	Left	Touch	/	30.01	31.00	0.162	0.20	0.285	0.36	0.02
661	1880	Left	Touch	Fig.3	29.82	31.00	0.199	0.26	0.331	0.43	0.05
512	1850.2	Left	Touch	/	30.09	31.00	0.167	0.21	0.316	0.39	0.03
661	1880	Left	Tilt	/	29.82	31.00	0.036	0.05	0.054	0.07	-0.05
661	1880	Right	Touch	/	29.82	31.00	0.146	0.19	0.232	0.30	0.13
661	1880	Right	Tilt	/	29.82	31.00	0.025	0.03	0.041	0.05	0.04

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

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
661	1880	GPRS (1)	Front	/	29.82	31.00	0.081	0.11	0.131	0.17	-0.11
810	1909.8	GPRS (1)	Rear	/	30.01	31.00	0.228	0.29	0.377	0.47	0.05
661	1880	GPRS (1)	Rear	/	29.82	31.00	0.231	0.30	0.387	0.51	-0.03
512	1850.2	GPRS (1)	Rear	Fig.4	30.09	31.00	0.261	0.32	0.432	0.53	-0.14
661	1880	GPRS (1)	Rear unfold	/	29.82	31.00	0.153	0.20	0.225	0.30	-0.08
512	1850.2	GPRS (1)	Rear	/	30.00	31.00	0.255	0.32	0.416	0.52	0.10

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-5: SAR Values (WCDMA 1900 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
9538	1907.6	Left	Touch	/	23.30	24.00	0.360	0.42	0.574	0.67	0.07
9400	1880	Left	Touch	Fig.5	23.32	24.00	0.398	0.47	0.656	0.77	0.04
9262	1852.4	Left	Touch	/	23.21	24.00	0.372	0.45	0.604	0.72	0.01
9400	1880	Left	Tilt	/	23.32	24.00	0.074	0.09	0.110	0.13	0.13
9400	1880	Right	Touch	/	23.32	24.00	0.245	0.29	0.402	0.47	0.06
9400	1880	Right	Tilt	/	23.32	24.00	0.044	0.05	0.072	0.08	-0.13

Table 14.1-6: SAR Values (WCDMA 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9400	1880	Front	/	23.32	24.00	0.160	0.19	0.258	0.30	-0.10
9538	1907.6	Rear	/	23.30	24.00	0.438	0.51	0.732	0.86	0.10
9400	1880	Rear	/	23.32	24.00	0.443	0.52	0.739	0.86	-0.10
9262	1852.4	Rear	Fig.6	23.21	24.00	0.455	0.55	0.753	0.90	0.03
9400	1880	Rear unfold	/	23.32	24.00	0.283	0.33	0.422	0.49	0.11

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-7: SAR Values (WCDMA 1700 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
1513	1752.6	Left	Touch	/	23.12	24.00	0.151	0.18	0.405	0.50	-0.03
1412	1732.4	Left	Touch	Fig.7	23.34	24.00	0.164	0.19	0.454	0.53	-0.09
1312	1712.4	Left	Touch	/	23.32	24.00	0.157	0.18	0.425	0.50	0.08
1412	1732.4	Left	Tilt	/	23.34	24.00	0.025	0.03	0.063	0.07	-0.09
1412	1732.4	Right	Touch	/	23.34	24.00	0.134	0.16	0.341	0.40	-0.05
1412	1732.4	Right	Tilt	/	23.34	24.00	0.022	0.03	0.051	0.06	0.08

Table 14.1-8: SAR Values (WCDMA 1700 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1412	1732.4	Front	/	23.34	24.00	0.130	0.15	0.20	0.23	-0.05
1513	1752.6	Rear	Fig.8	23.12	24.00	0.528	0.65	0.863	1.06	0.10
1412	1732.4	Rear	/	23.34	24.00	0.478	0.56	0.783	0.91	-0.06
1312	1712.4	Rear	/	23.32	24.00	0.435	0.51	0.705	0.82	-0.13
1412	1732.4	Rear unfold	/	23.34	24.00	0.321	0.37	0.489	0.57	-0.12

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-9: SAR Values (WCDMA 850 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
4182	836.4	Left	Touch	/	23.03	24.00	0.166	0.21	0.282	0.35	-0.04
4182	836.4	Left	Tilt	/	23.03	24.00	0.101	0.13	0.129	0.16	0.11
4233	846.6	Right	Touch	Fig.9	22.99	24.00	0.289	0.36	0.441	0.56	0.00
4182	836.4	Right	Touch	/	23.03	24.00	0.281	0.35	0.416	0.52	-0.08
4132	826.4	Right	Touch	/	23.08	24.00	0.275	0.34	0.414	0.51	0.06
4182	836.4	Right	Tilt	/	23.03	24.00	0.105	0.13	0.131	0.16	0.09

Table 14.1-10: SAR Values (WCDMA 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
4183	836.6	Front	/	23.03	24.00	0.068	0.09	0.090	0.11	-0.03
4233	846.6	Rear	Fig.10	22.99	24.00	0.225	0.28	0.317	0.40	0.11
4183	836.6	Rear	/	23.03	24.00	0.200	0.25	0.283	0.35	0.13
4132	826.4	Rear	/	23.08	24.00	0.172	0.21	0.251	0.31	-0.04
4183	836.6	Rear unfold	/	23.03	24.00	0.176	0.22	0.245	0.31	0.05

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-11: SAR Values (LTE Band2 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
18900	1880	1RB_Mid	Left	Touch	Fig.11	23.49	23.50	0.295	0.30	0.489	0.49	0.12
18900	1880	1RB_Mid	Left	Tilt	/	23.49	23.50	0.059	0.06	0.091	0.09	-0.01
18900	1880	1RB_Mid	Right	Touch	/	23.49	23.50	0.224	0.22	0.398	0.40	0.12
18900	1880	1RB_Mid	Right	Tilt	/	23.49	23.50	0.035	0.04	0.056	0.06	-0.06
19100	1900	50RB_Mid	Left	Touch	/	22.24	22.50	0.218	0.23	0.360	0.38	0.00
19100	1900	50RB_Mid	Left	Tilt	/	22.24	22.50	0.041	0.04	0.063	0.07	-0.08
19100	1900	50RB_Mid	Right	Touch	/	22.24	22.50	0.152	0.16	0.270	0.29	0.02
19100	1900	50RB_Mid	Right	Tilt	/	22.24	22.50	0.027	0.03	0.044	0.05	0.05

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-12: SAR Values (LTE Band2 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)	
Ch.	MHz											
18900	1880	1RB_Mid	Front	/	23.49	23.50	0.150	0.15	0.238	0.24	-0.06	
18900	1880	1RB_Mid	Rear	Fig.12	23.49	23.50	0.401	0.40	0.664	0.67	0.03	
18900	1880	1RB_Mid	Rear unfold	/	23.49	23.50	0.252	0.25	0.381	0.38	-0.07	
19100	1900	50RB_Mid	Front	/	22.24	22.50	0.109	0.12	0.173	0.18	0.11	
19100	1900	50RB_Mid	Rear	/	22.24	22.50	0.185	0.20	0.346	0.37	0.13	
19100	1900	50RB_Mid	Rear unfold	Note2	22.24	22.50	0.111	0.12	0.209	0.22	0.00	

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-13: SAR Values (LTE Band4 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
20300	1745	1RB_Mid	Left	Touch	Fig.13	23.46	23.50	0.306	0.31	0.489	0.49	0.03
20300	1745	1RB_Mid	Left	Tilt	/	23.46	23.50	0.072	0.07	0.112	0.11	-0.12
20300	1745	1RB_Mid	Right	Touch	/	23.46	23.50	0.296	0.30	0.475	0.48	0.10
20300	1745	1RB_Mid	Right	Tilt	/	23.46	23.50	0.064	0.06	0.093	0.09	-0.01
20300	1745	50RB_Mid	Left	Touch	/	22.30	22.50	0.236	0.25	0.375	0.39	-0.06
20300	1745	50RB_Mid	Left	Tilt	/	22.30	22.50	0.056	0.06	0.087	0.09	-0.12
20300	1745	50RB_Mid	Right	Touch	/	22.30	22.50	0.111	0.12	0.221	0.23	0.01
20300	1745	50RB_Mid	Right	Tilt	/	22.30	22.50	0.050	0.05	0.073	0.08	-0.07

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-14: SAR Values (LTE Band4 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
20300	1745	1RB_Mid	Front	/	23.46	23.50	0.146	0.15	0.225	0.23	0.04
20300	1745	1RB_Mid	Rear	Fig.14	23.46	23.50	0.462	0.47	0.753	0.76	-0.03
20300	1745	1RB_Mid	Rear unfold	/	23.46	23.50	0.323	0.33	0.563	0.57	0.06
20300	1745	50RB_Mid	Front	/	22.30	22.50	0.118	0.12	0.183	0.19	0.08
20300	1745	50RB_Mid	Rear	/	22.30	22.50	0.438	0.46	0.700	0.73	-0.02
20300	1745	50RB_Mid	Rear unfold	Note2	22.30	22.50	0.256	0.27	0.392	0.41	0.13

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-15: SAR Values (LTE Band5 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
20600	844	1RB_Mid	Left	Touch	/	23.28	23.50	0.135	0.14	0.223	0.23	0.07
20600	844	1RB_Mid	Left	Tilt	/	23.28	23.50	0.085	0.09	0.109	0.11	-0.06
20600	844	1RB_Mid	Right	Touch	Fig.15	23.28	23.50	0.243	0.26	0.366	0.39	-0.03
20600	844	1RB_Mid	Right	Tilt	/	23.28	23.50	0.122	0.13	0.089	0.09	-0.10
20600	844	25RB_High	Left	Touch	/	22.22	22.50	0.106	0.11	0.175	0.19	0.08
20600	844	25RB_High	Left	Tilt	/	22.22	22.50	0.066	0.07	0.085	0.09	-0.04
20600	844	25RB_High	Right	Touch	/	22.22	22.50	0.179	0.19	0.273	0.29	0.12
20600	844	25RB_High	Right	Tilt	/	22.22	22.50	0.069	0.07	0.086	0.09	-0.01

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-16: SAR Values (LTE Band5 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
20600	844	1RB_Mid	Front	/	23.28	23.50	0.086	0.09	0.111	0.12	-0.10
20600	844	1RB_Mid	Rear	Fig.16	23.28	23.50	0.243	0.26	0.341	0.36	-0.05
20600	844	1RB_Mid	Rear unfold	/	23.28	23.50	0.177	0.19	0.242	0.25	0.09
20600	844	25RB_High	Front	/	22.22	22.50	0.064	0.07	0.084	0.09	0.13
20600	844	25RB_High	Rear	/	22.22	22.50	0.194	0.21	0.271	0.29	0.02
20600	844	25RB_High	Rear unfold	Note2	22.22	22.50	0.126	0.13	0.173	0.18	0.02

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-17: SAR Values (LTE Band12 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
23060	704	1RB_Mid	Left	Touch	/	23.33	23.50	0.242	0.25	0.394	0.41	-0.10
23060	704	1RB_Mid	Left	Tilt	/	23.33	23.50	0.070	0.07	0.093	0.10	0.01
23060	704	1RB_Mid	Right	Touch	Fig.17	23.33	23.50	0.257	0.27	0.417	0.43	0.04
23060	704	1RB_Mid	Right	Tilt	/	23.33	23.50	0.071	0.07	0.093	0.10	0.07
23130	711	25RB_High	Left	Touch	/	22.04	22.50	0.198	0.22	0.320	0.36	0.03
23130	711	25RB_High	Left	Tilt	/	22.04	22.50	0.048	0.05	0.061	0.07	0.03
23130	711	25RB_High	Right	Touch	/	22.04	22.50	0.205	0.23	0.316	0.35	-0.10
23130	711	25RB_High	Right	Tilt	/	22.04	22.50	0.056	0.06	0.073	0.08	0.11

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-18: SAR Values (LTE Band12 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23060	704	1RB_Mid	Front	/	23.33	23.50	0.092	0.10	0.126	0.13	-0.11
23060	704	1RB_Mid	Rear	Fig.18	23.33	23.50	0.331	0.34	0.474	0.49	0.02
23060	704	1RB_Mid	Rear unfold	/	23.33	23.50	0.317	0.33	0.432	0.45	-0.05
23130	711	25RB_High	Front	/	22.04	22.50	0.075	0.08	0.103	0.11	0.03
23130	711	25RB_High	Rear	/	22.04	22.50	0.283	0.31	0.406	0.45	-0.08
23130	711	25RB_High	Rear unfold	Note2	22.04	22.50	0.266	0.30	0.371	0.41	0.12

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-19: SAR Values (LTE Band14 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
23330	793	1RB_High	Left	Touch	Fig.19	23.47	23.50	0.340	0.34	0.564	0.57	-0.04
23330	793	1RB_High	Left	Tilt	/	23.47	23.50	0.134	0.13	0.180	0.18	0.05
23330	793	1RB_High	Right	Touch	/	23.47	23.50	0.338	0.34	0.538	0.54	0.00
23330	793	1RB_High	Right	Tilt	/	23.47	23.50	0.139	0.14	0.185	0.19	-0.12
23330	793	25RB_High	Left	Touch	/	22.47	22.50	0.278	0.28	0.461	0.46	0.00
23330	793	25RB_High	Left	Tilt	/	22.47	22.50	0.110	0.11	0.149	0.15	-0.08
23330	793	25RB_High	Right	Touch	/	22.47	22.50	0.275	0.28	0.439	0.44	-0.04
23330	793	25RB_High	Right	Tilt	/	22.47	22.50	0.116	0.12	0.155	0.16	-0.07

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-20: SAR Values (LTE Band14 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23330	793	1RB_High	Front	/	23.47	23.50	0.116	0.12	0.160	0.16	-0.02
23330	793	1RB_High	Rear	Fig.20	23.47	23.50	0.365	0.37	0.532	0.54	0.19
23330	793	1RB_High	Rear unfold	/	23.47	23.50	0.272	0.27	0.394	0.40	0.01
23330	793	25RB_High	Front	/	22.47	22.50	0.093	0.09	0.127	0.13	-0.10
23330	793	25RB_High	Rear	/	22.47	22.50	0.299	0.30	0.433	0.44	0.00
23330	793	25RB_High	Rear unfold	Note2	22.47	22.50	0.234	0.24	0.338	0.34	-0.11

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-21: SAR Values (BT - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
39	2441	Left	Cheek	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
78	2441	Left	Cheek	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
0	2441	Left	Cheek	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
78	2480	Left	Tilt	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2402	Right	Cheek	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2441	Right	Tilt	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/

Table 14.1-22: SAR Values (BT - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
39	2441	Front	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
0	2402	Front	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
78	2480	Front	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2441	Rear	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2441	Left	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2441	Right	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2441	Bottom	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/
39	2441	Rear unfold	/	11.49	12	<0.01	<0.01	<0.01	<0.01	/

Note: The distance between the EUT and the phantom bottom is 15mm.

14.2 SAR results for Standard procedure

There is zoom scan measurement to be added for the highest measured SAR in each exposure configuration/band.

Table 14.2-1: SAR Values (GSM 850 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	Right	Touch	Fig.1	32.97	33.50	0.270	0.31	0.420	0.47	0.01

Table 14.2-2: SAR Values (GSM 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
251	848.8	GPRS (1)	Rear	Fig.2	33.01	33.50	0.168	0.19	0.238	0.27	-0.01

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-3: SAR Values (GSM 1900 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
661	1880	Left	Touch	Fig.3	29.82	31.00	0.199	0.26	0.331	0.43	0.05

Table 14.2-4: SAR Values (GSM 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
512	1850.2	GPRS (1)	Rear	Fig.4	30.09	31.00	0.261	0.32	0.432	0.53	-0.14

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-5: SAR Values (WCDMA 1900 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
9400	1880	Left	Touch	Fig.5	23.32	24.00	0.398	0.47	0.656	0.77	0.04

Table 14.2-6: SAR Values (WCDMA 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9262	1852.4	Rear	Fig.6	23.21	24.00	0.455	0.55	0.753	0.90	0.03

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-7: SAR Values (WCDMA 1700 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
1412	1732.4	Left	Touch	Fig.7	23.34	24.00	0.164	0.19	0.454	0.53	-0.09

Table 14.2-8: SAR Values (WCDMA 1700 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1513	1752.6	Rear	Fig.8	23.12	24.00	0.528	0.65	0.863	1.06	0.10

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-9: SAR Values (WCDMA 850 MHz Band - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
4233	846.6	Right	Touch	Fig.9	22.99	24.00	0.289	0.36	0.441	0.56	0.00

Table 14.2-10: SAR Values (WCDMA 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
4233	846.6	Rear	Fig.10	22.99	24.00	0.225	0.28	0.317	0.40	0.11

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-11: SAR Values (LTE Band2 - Head)

Ambient Temperature: 22.9 ºC							Liquid Temperature: 22.5ºC					
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
18900	1880	1RB_Mid	Left	Touch	Fig.11	23.49	23.50	0.295	0.30	0.489	0.49	0.12

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-12: SAR Values (LTE Band2 - Body)

Ambient Temperature: 22.9 ºC							Liquid Temperature: 22.5ºC				
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
18900	1880	1RB_Mid	Rear	Fig.12	23.49	23.50	0.401	0.40	0.664	0.67	0.03

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-13: SAR Values (LTE Band4 - Head)

Ambient Temperature: 22.9 ºC							Liquid Temperature: 22.5ºC					
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
20300	1745	1RB_Mid	Left	Touch	Fig.13	23.46	23.50	0.306	0.31	0.489	0.49	0.03

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-14: SAR Values (LTE Band4 - Body)

Ambient Temperature: 22.9 ºC							Liquid Temperature: 22.5ºC				
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
20300	1745	1RB_Mid	Rear	Fig.14	23.46	23.50	0.462	0.47	0.753	0.76	-0.03

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-15: SAR Values (LTE Band5 - Head)

Ambient Temperature: 22.9 ºC							Liquid Temperature: 22.5ºC					
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
20600	844	1RB_Mid	Right	Touch	Fig.15	23.28	23.50	0.243	0.26	0.366	0.39	-0.03

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-16: SAR Values (LTE Band5 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
20600	844	1RB_Mid	Rear	Fig.16	23.28	23.50	0.243	0.26	0.341	0.36	-0.05

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-17: SAR Values (LTE Band12 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
23060	704	1RB_Mid	Right	Touch	Fig.17	23.33	23.50	0.257	0.27	0.417	0.43	0.04

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-18: SAR Values (LTE Band12 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23060	704	1RB_Mid	Rear	Fig.18	23.33	23.50	0.331	0.34	0.474	0.49	0.02

Note: The distance between the EUT and the phantom bottom is 15mm.

Table 14.2-19: SAR Values (LTE Band14 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
Frequency		Mode	Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
23330	793	1RB_High	Left	Touch	Fig.19	23.47	23.50	0.340	0.34	0.564	0.57	-0.04

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-20: SAR Values (LTE Band14 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23330	793	1RB_High	Rear	Fig.20	23.47	23.50	0.365	0.37	0.532	0.54	0.19

Note: The distance between the EUT and the phantom bottom is 15mm.

14.3 WLAN Evaluation

According to the KDB248227 D01, SAR is measured for 802.11b DSSS using the initial test position procedure.

Head Evaluation

Table 14.3-1: SAR Values (WLAN - Head)– 802.11b (Fast SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
2437	6	Left	Touch	/	16.41	17.50	0.132	0.17	0.243	0.31	0.06
2437	6	Left	Tilt	/	16.41	17.50	0.015	0.02	0.026	0.03	-0.08
2437	6	Right	Touch	/	16.41	17.50	0.214	0.28	0.401	0.52	0.03
2437	6	Right	Tilt	/	16.41	17.50	0.025	0.03	0.043	0.06	0.04

As shown above table, the initial test position for head is “Right Touch”. So the head SAR of WLAN is presented as below:

Table 14.3-2: SAR Values (WLAN - Head)– 802.11b (Full SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
2437	6	Left	Touch	/	16.41	17.50	0.146	0.19	0.251	0.32	0.06
2437	6	Right	Touch	Fig.21	16.41	17.50	0.235	0.30	0.475	**0.61**	0.03
Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg. Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.											

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. The scaled reported SAR is presented as below.

Table 14.3-3: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃							
Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.						
2437	6	Left	Touch	100%	100%	**0.32**	**0.32**
2437	6	Right	Touch	100%	100%	**0.61**	**0.61**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.

Body Evaluation

Table 14.3-4: SAR Values (WLAN - Body)– 802.11b (Fast SAR)

Ambient Temperature: 22.9 ºC					Liquid Temperature: 22.5ºC				
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Front	/	18.99	19.00	0.023	0.02	0.042	0.04	0.08
2437	6	Rear	/	18.99	19.00	0.051	0.05	0.102	0.10	-0.03
2437	6	Rear unfold	/	18.99	19.00	0.092	0.09	0.159	0.16	0.09

As shown above table, the initial test position for body is “Rear unfold”. So the body SAR of WLAN is presented as below:

Table 14.3-5: SAR Values (WLAN - Body)– 802.11b (Full SAR)

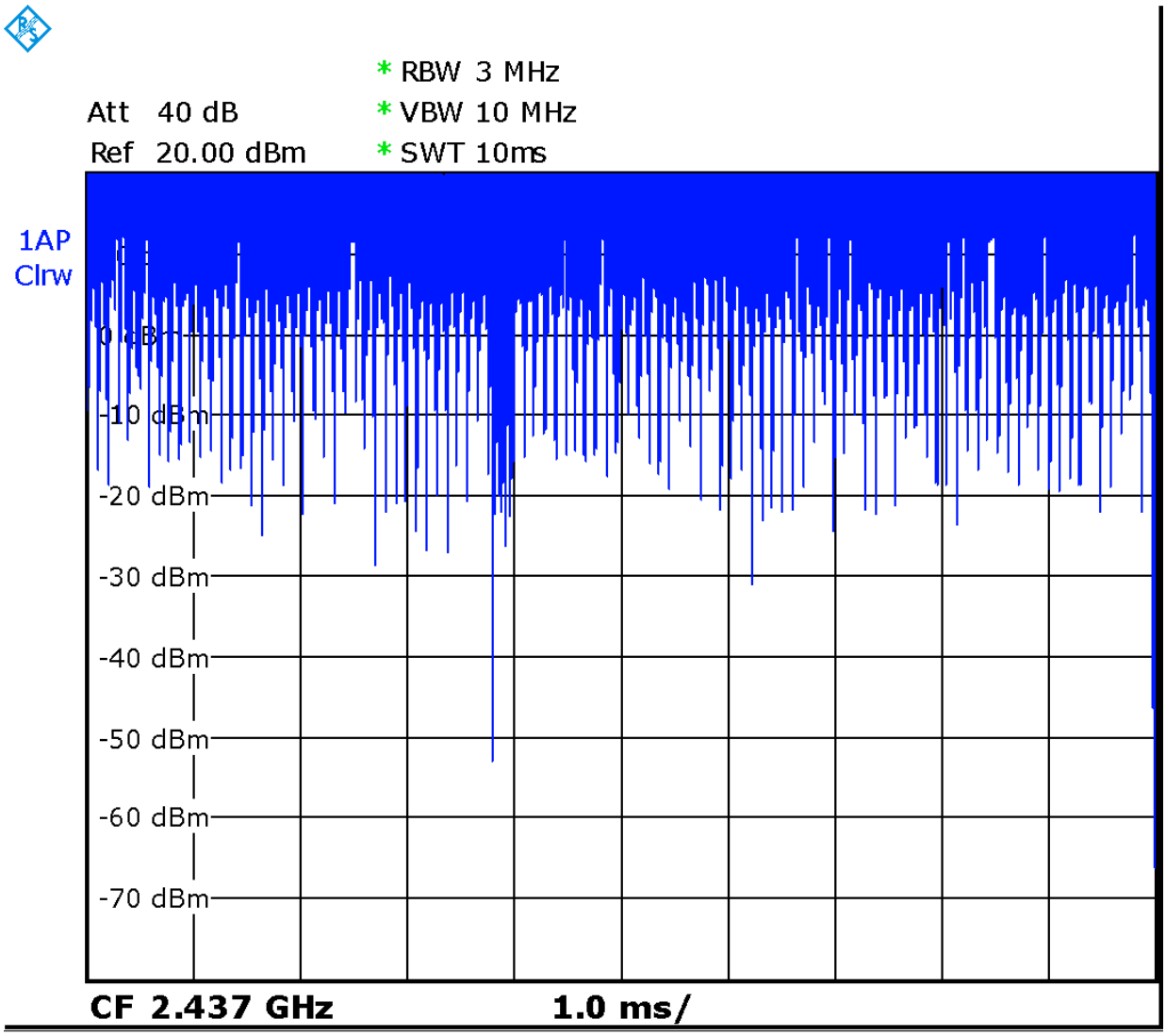
Ambient Temperature: 22.9 ºC					Liquid Temperature: 22.5ºC				
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Rear unfold	Fig.22	18.99	19.00	0.105	**0.11**	0.168	**0.17**	0.09
Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg. Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.									

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. The scaled reported SAR is presented as below.

Table 14.3-6: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 ºC		Liquid Temperature: 22.5ºC				
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Rear unfold	100%	100%	**0.17**	**0.17**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.



Picture 14.1 Duty factor plot for CH6

15 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; steps 2) 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 ≥ 1.45 W/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 15.1: SAR Measurement Variability for Body W1700 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
1513	1752.6	Rear	15	0.863	0.861	1.00	/

16 Measurement Uncertainty

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

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

Combined standard uncertainty	$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					9.55	9.43	257
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$					19.1	18.9	

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

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

	(target)									
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.7	10.6	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.4	21.1	

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

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞

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

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

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

16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.5	13.4	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						27.0	26.8	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 24, 2019	One year
02	Power meter	NRVD	102083	October 24, 2018	One year
03	Power sensor	NRV-Z5	100542		
04	Signal Generator	E4438C	MY49070393	January 4, 2019	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 17, 2019	One year
07	BTS	CMW500	159890	January 3, 2019	One year
08	E-field Probe	SPEAG EX3DV4	7514	August 27, 2018	One year
09	DAE	SPEAG DAE4	1525	September 18, 2018	One year
10	Dipole Validation Kit	SPEAG D750V3	1017	July 23, 2018	One year
11	Dipole Validation Kit	SPEAG D835V2	4d069	July 23, 2018	One year
12	Dipole Validation Kit	SPEAG D1750V2	1003	July 20, 2018	One year
13	Dipole Validation Kit	SPEAG D1900V2	5d101	July 24, 2018	One year
14	Dipole Validation Kit	SPEAG D2450V2	853	July 24, 2018	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_ Right Cheek Middle
Date: 2019/6/18
Electronics: DAE4 Sn1525
Medium: head 835 MHz
Medium parameters used: f = 836.6 MHz; σ = 0.875 mho/m; εr = 42.51; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: GSM850 836.6 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 –SN7514 ConvF(9.09, 9.09, 9.09)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.601 W/kg

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

Reference Value = 3.119 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.721 W/kg
SAR(1 g) = 0.420 W/kg; SAR(10 g) = 0.270 W/kg
Maximum value of SAR (measured) = 0.563 W/kg

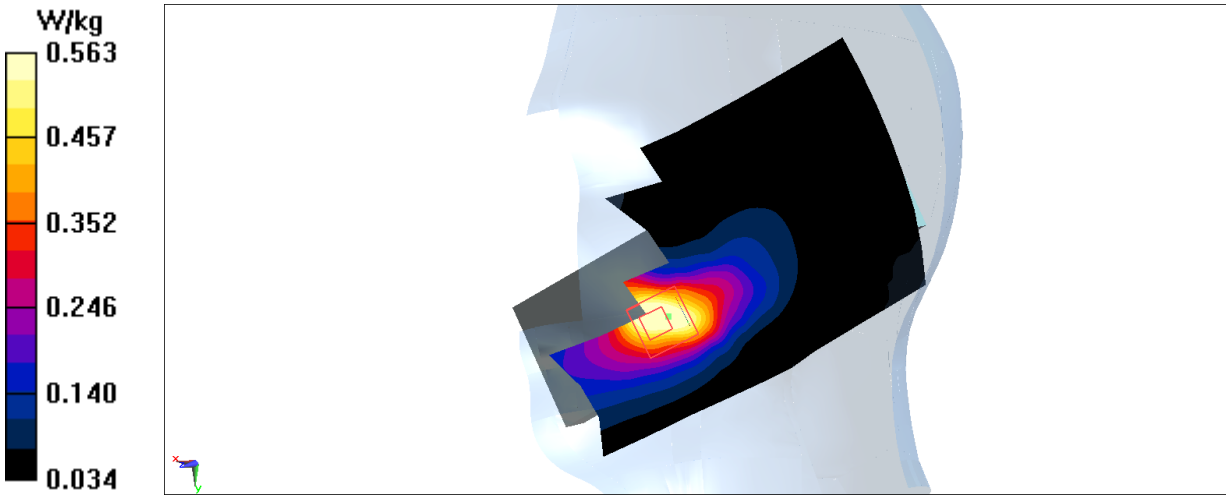


Fig.1 850MHz

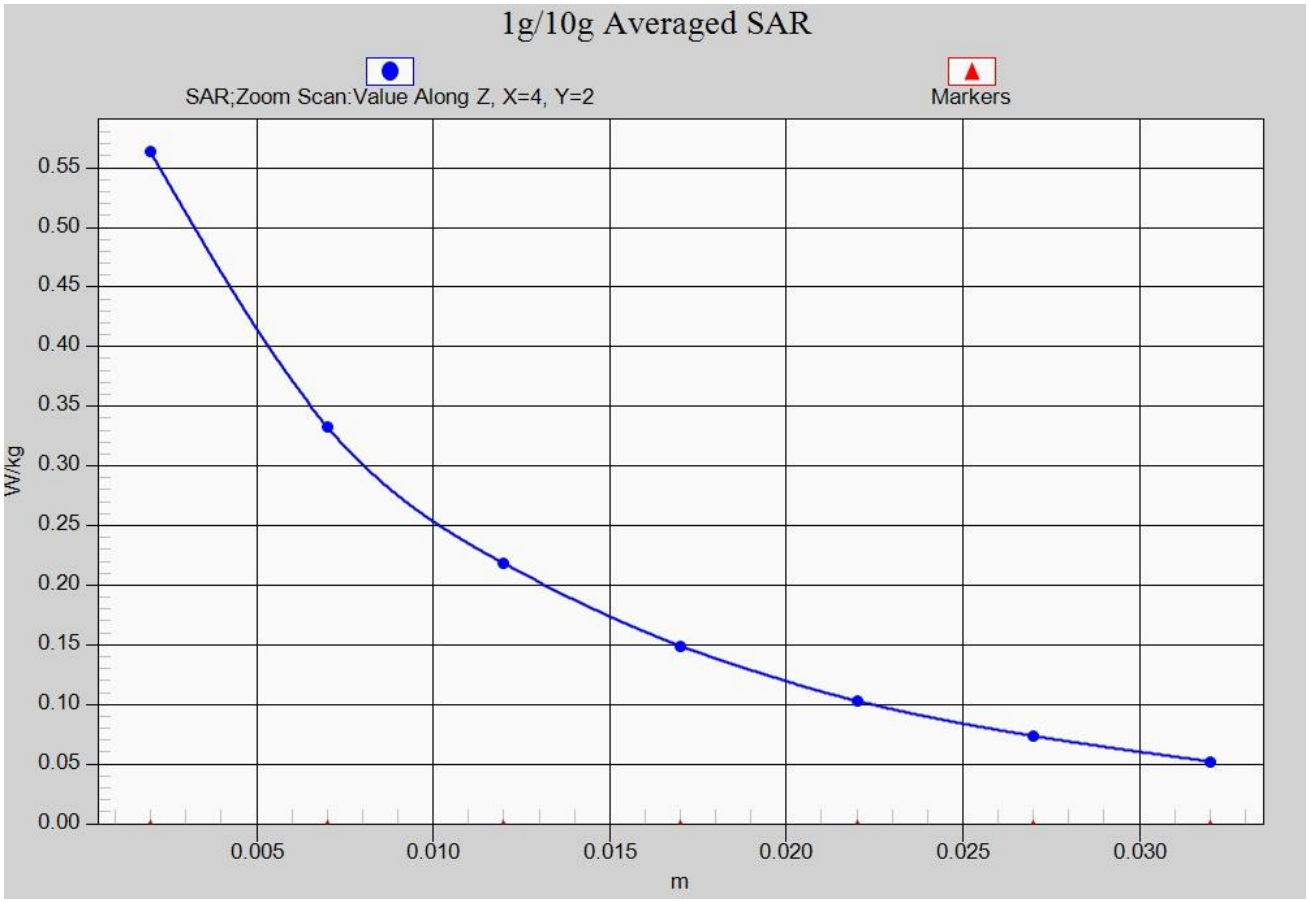


Fig. 1-1 Z-Scan at power reference point (850 MHz)

GSM850_ Rear High
Date: 2019/6/18
Electronics: DAE4 Sn1525
Medium: body 835 MHz
Medium parameters used: f = 848.8 MHz; σ = 0.991 mho/m; εr = 54.84; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: GSM850 848.8 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 –SN7514 ConvF(9.47, 9.47, 9.47)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.294 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.84 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.168 W/kg
Maximum value of SAR (measured) = 0.286 W/kg

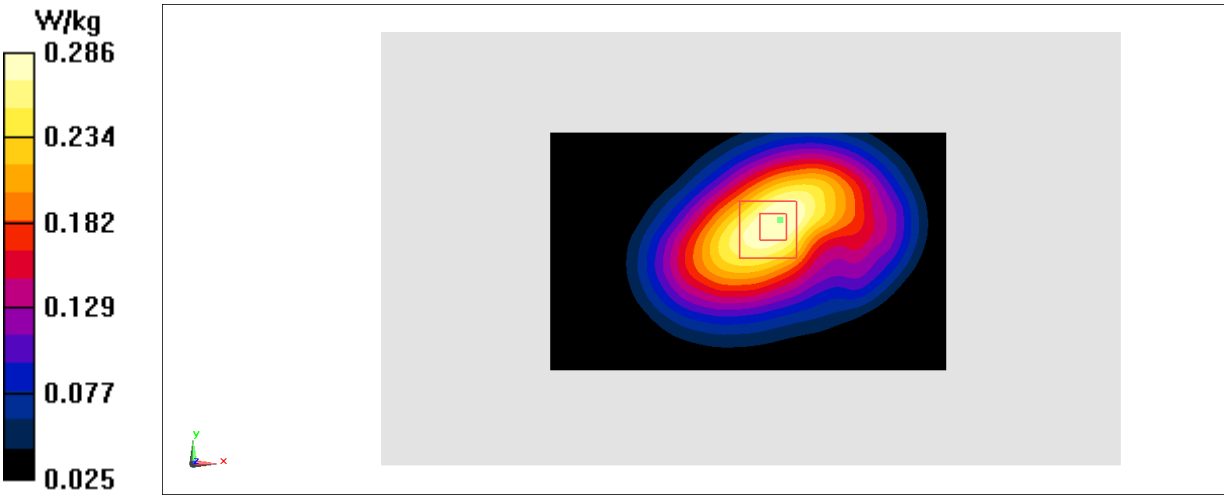


Fig.2 850 MHz

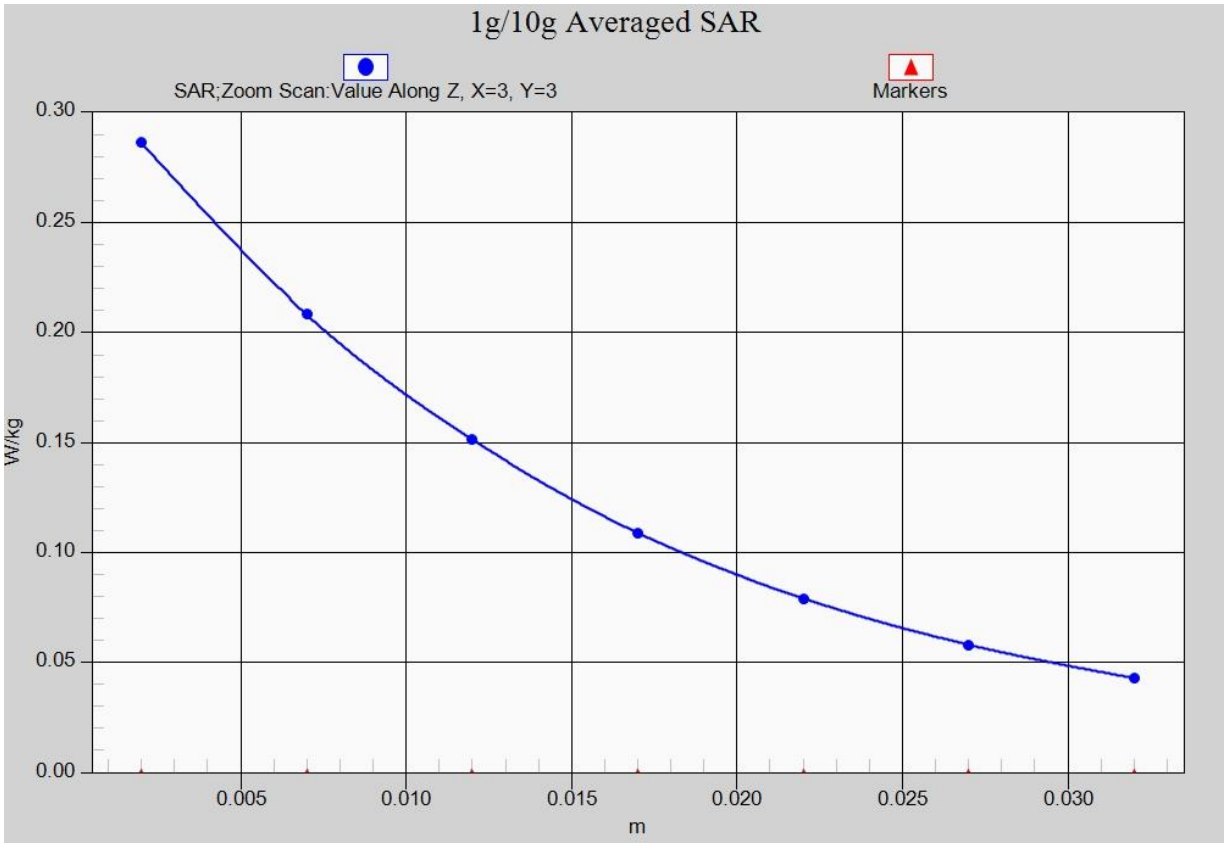


Fig. 2-1 Z-Scan at power reference point (850 MHz)

PCS1900_ Left Cheek Middle
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.393 mho/m; εr = 40.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: PCS1900 1880 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 –SN7514 ConvF(7.73, 7.73, 7.73)

Area Scan (61x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.468 W/kg

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

Reference Value = 2.934 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.539 W/kg
SAR(1 g) = 0.331 W/kg; SAR(10 g) = 0.199 W/kg
Maximum value of SAR (measured) = 0.430 W/kg

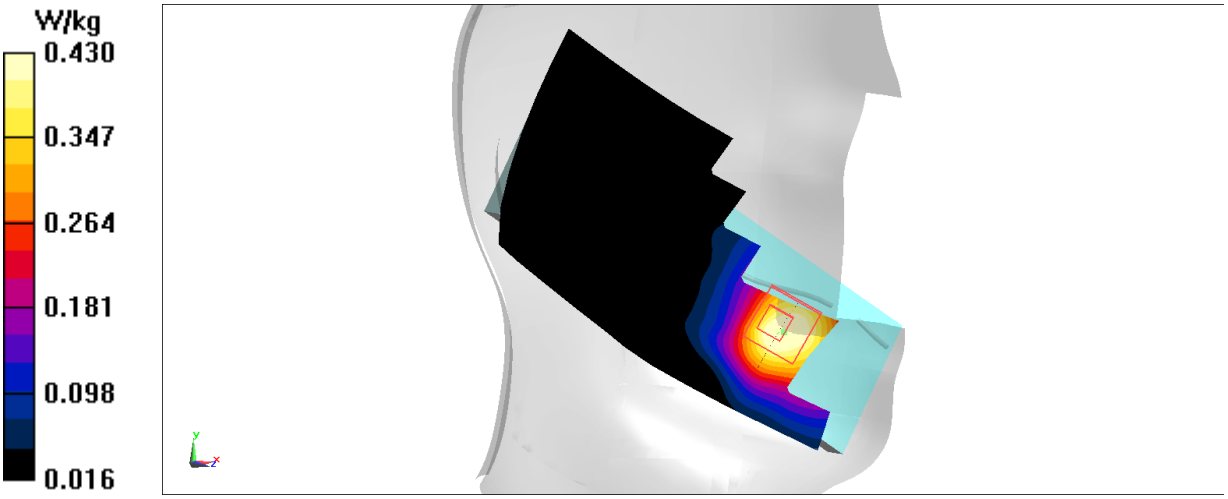


Fig.3 1900 MHz

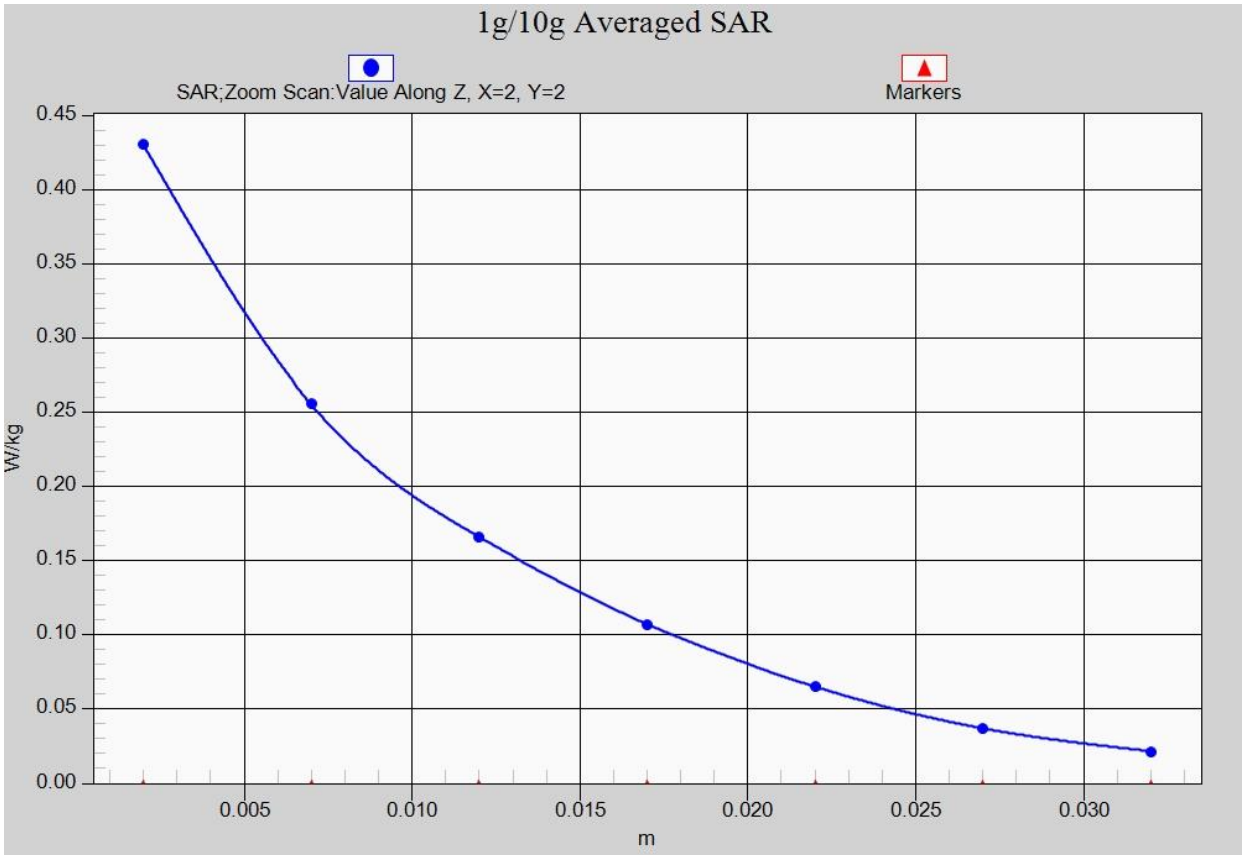


Fig. 3-1 Z-Scan at power reference point (1900 MHz)

PCS1900_Rear Low
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: body 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.517 mho/m; εr = 52.34; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: PCS1900 1850.2 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 –SN7514 ConvF(7.53, 7.53, 7.53)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.596 W/kg

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

Reference Value = 8.986 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.702 W/kg
SAR(1 g) = 0.432 W/kg; SAR(10 g) = 0.261 W/kg
Maximum value of SAR (measured) = 0.574 W/kg

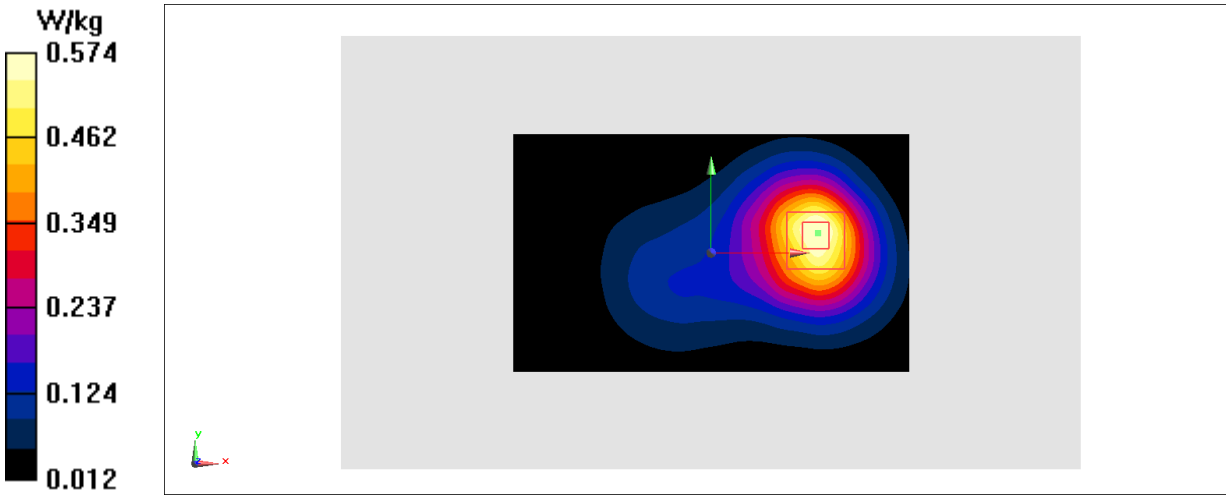


Fig.4 1900 MHz

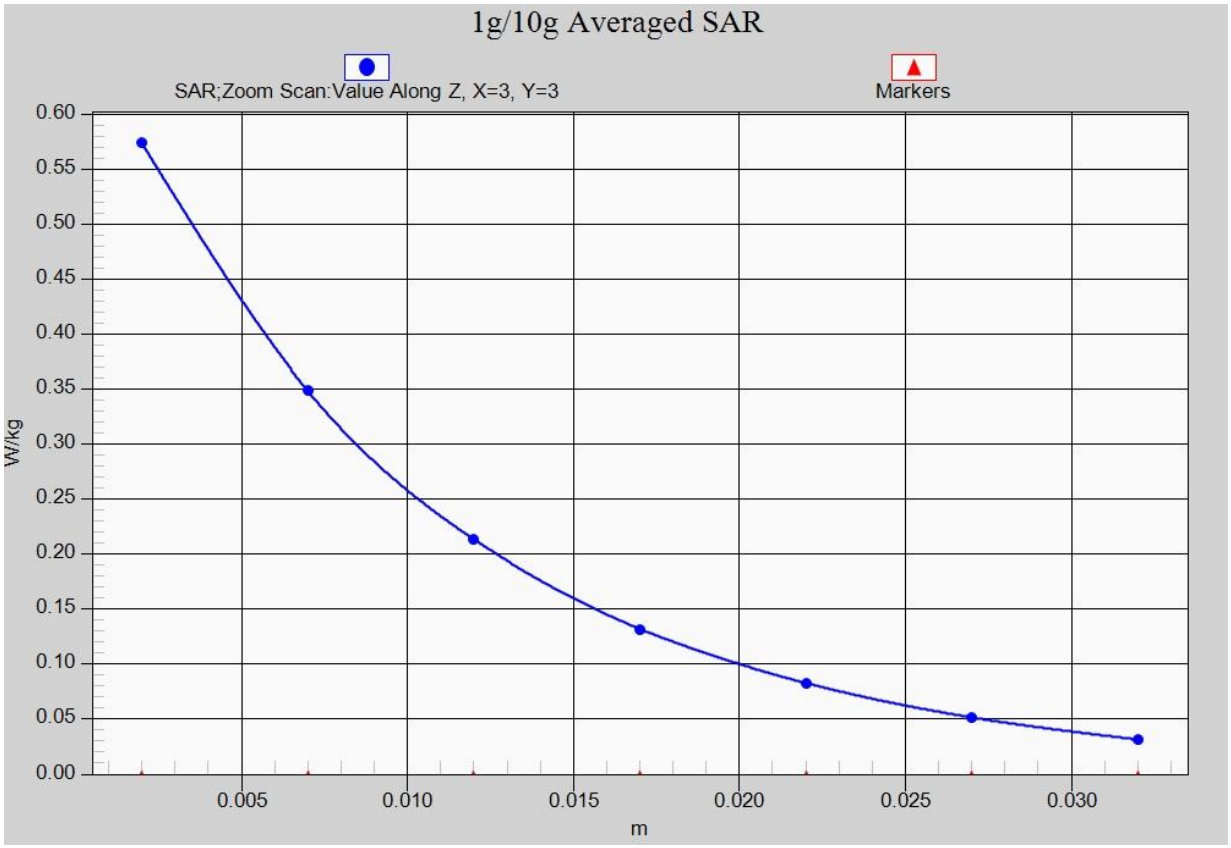


Fig. 4-1 Z-Scan at power reference point (1900 MHz)

WCDMA1900-BII_Left Cheek Middle
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.393 mho/m; εr = 40.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1900-BII 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.73, 7.73, 7.73)

Area Scan (61x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.977 W/kg

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

Reference Value = 4.692 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.656 W/kg; SAR(10 g) = 0.398 W/kg
Maximum value of SAR (measured) = 0.831 W/kg

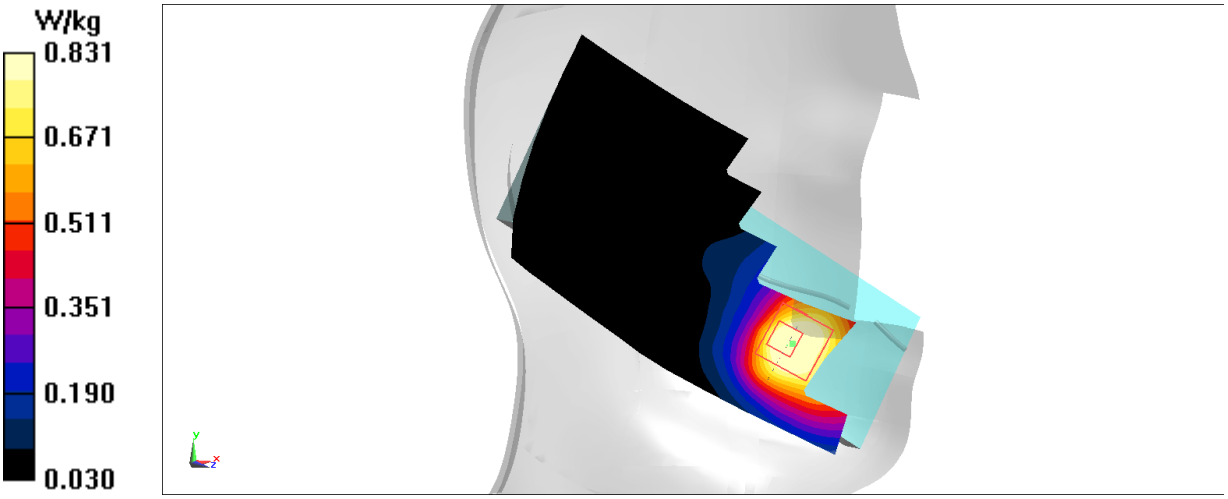


Fig.5 WCDMA1900

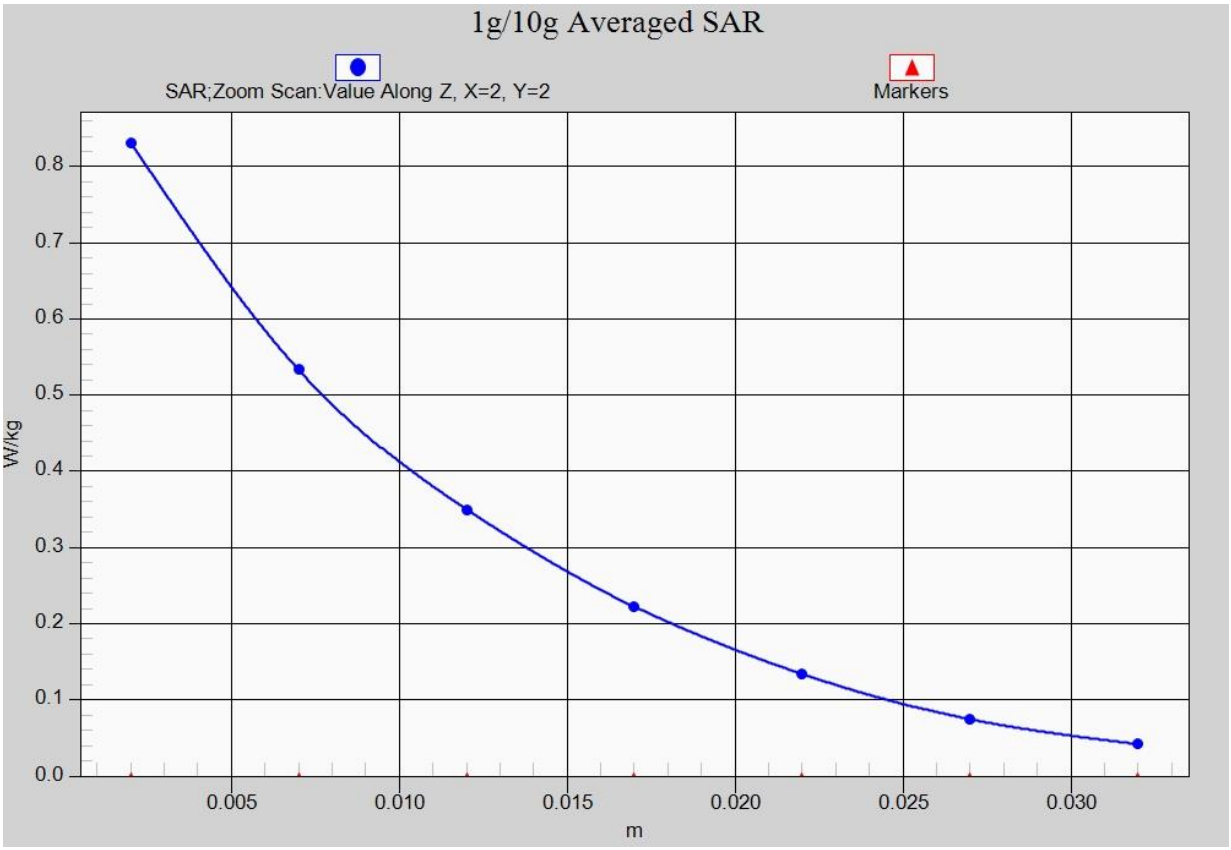


Fig. 5-1 Z-Scan at power reference point (WCDMA1900)

WCDMA1900-BII_Rear Low
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: body 1900 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.517 mho/m; εr = 52.34; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1900-BII 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.53, 7.53, 7.53)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.06 W/kg

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

Reference Value = 12.47 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.753 W/kg; SAR(10 g) = 0.455 W/kg
Maximum value of SAR (measured) = 0.992 W/kg

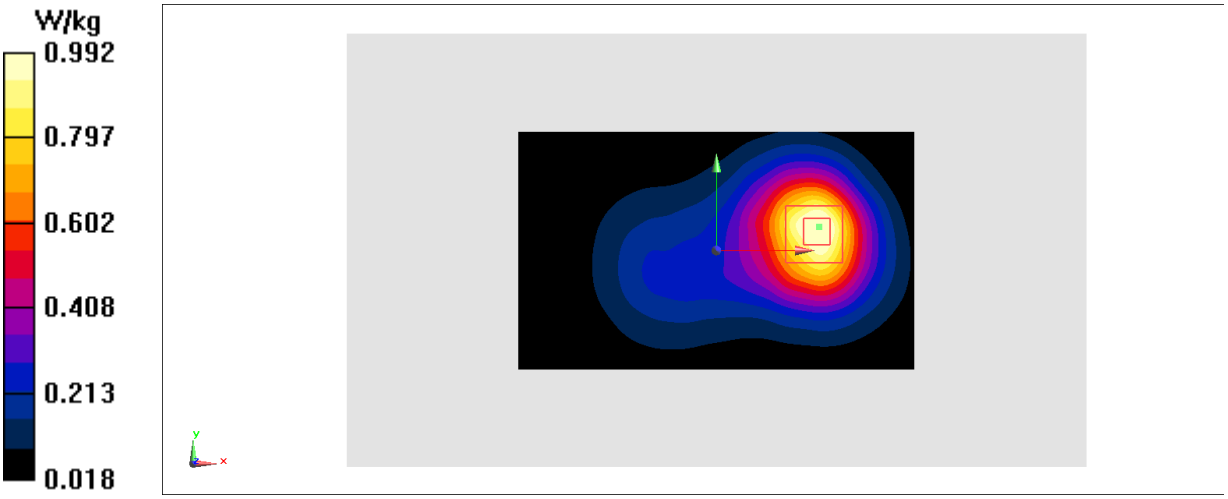


Fig.6 WCDMA1900

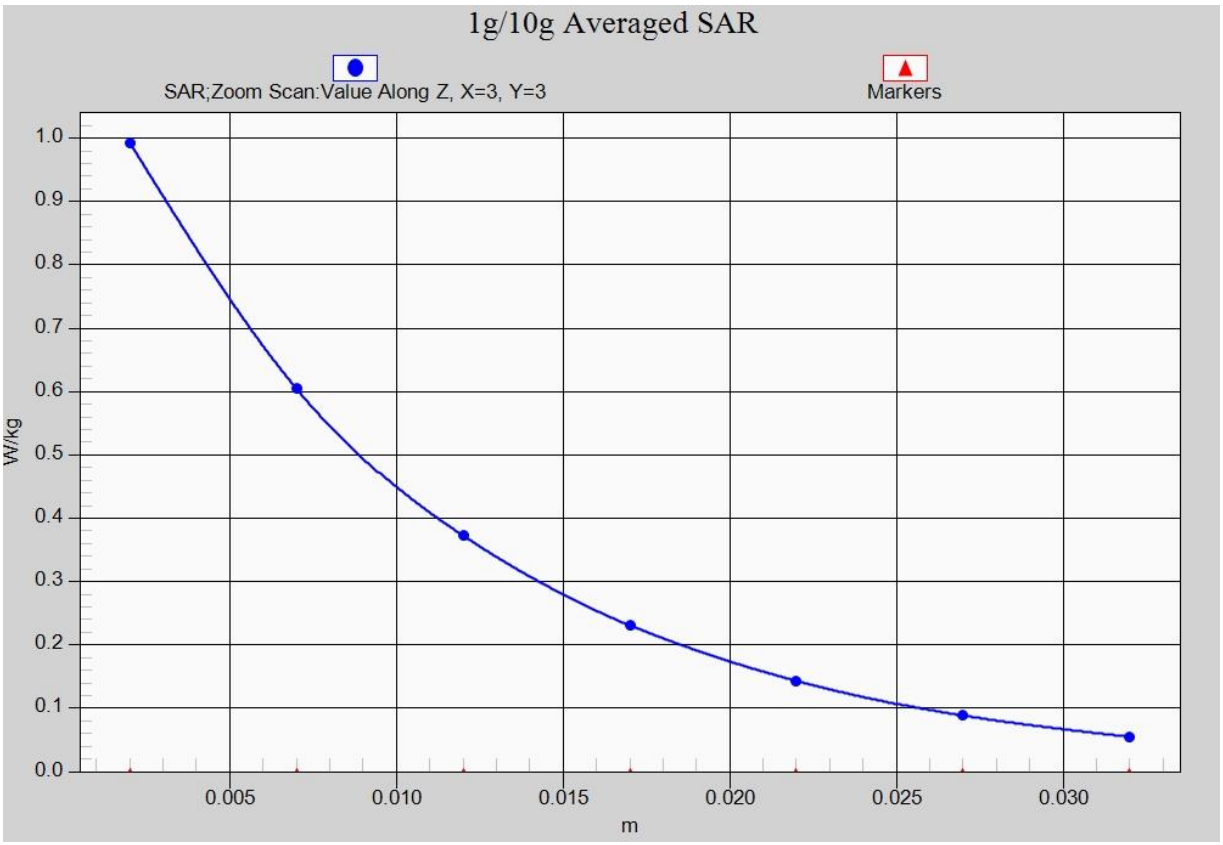


Fig. 6-1 Z-Scan at power reference point (WCDMA1900)

WCDMA1700-BIV_ Left Cheek Middle
Date: 2019/6/15
Electronics: DAE4 Sn1525
Medium: head 1750 MHz
Medium parameters used: f = 1732.4 MHz; σ = 1.386 mho/m; εr = 40.49; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(8.10, 8.10, 8.10)

Area Scan (61x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.696 W/kg

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

Reference Value = 4.694 V/m; Power Drift = -0.49 dB
Peak SAR (extrapolated) = 0.759 W/kg
SAR(1 g) = 0.454 W/kg; SAR(10 g) = 0.164 W/kg
Maximum value of SAR (measured) = 0.539 W/kg

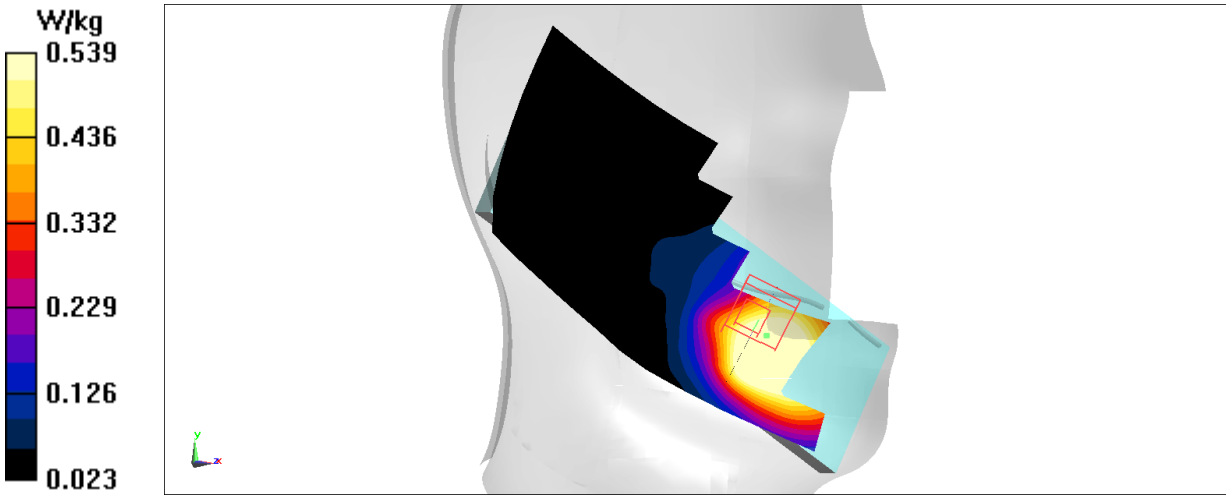


Fig.7 WCDMA1700

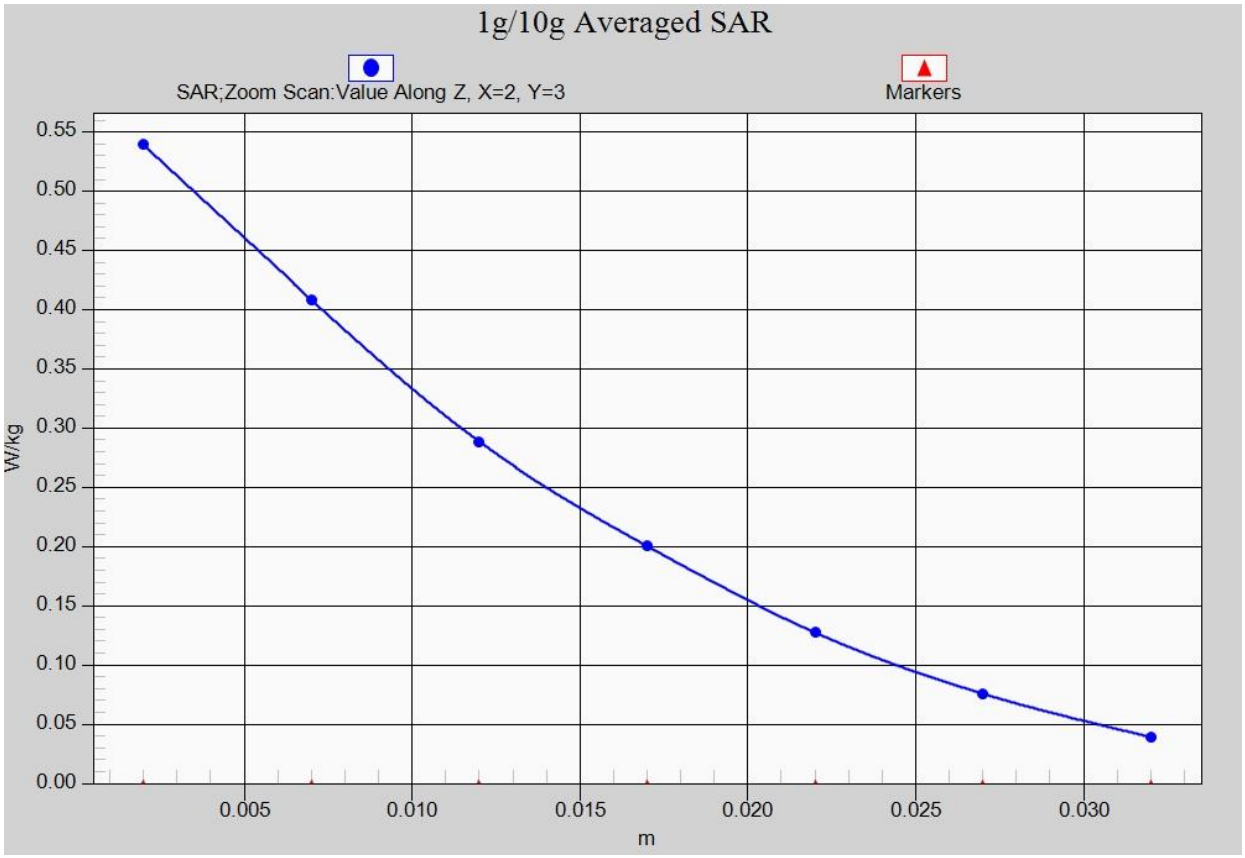


Fig. 7-1 Z-Scan at power reference point (WCDMA1700)

WCDMA1700-BIV_Rear High
Date: 2019/6/15
Electronics: DAE4 Sn1525
Medium: body 1750 MHz
Medium parameters used: f = 1752.6 MHz; σ = 1.469 mho/m; εr = 54.32; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.82, 7.82, 7.82)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.19 W/kg

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

Reference Value = 11.88 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.863 W/kg; SAR(10 g) = 0.528 W/kg
Maximum value of SAR (measured) = 1.12 W/kg

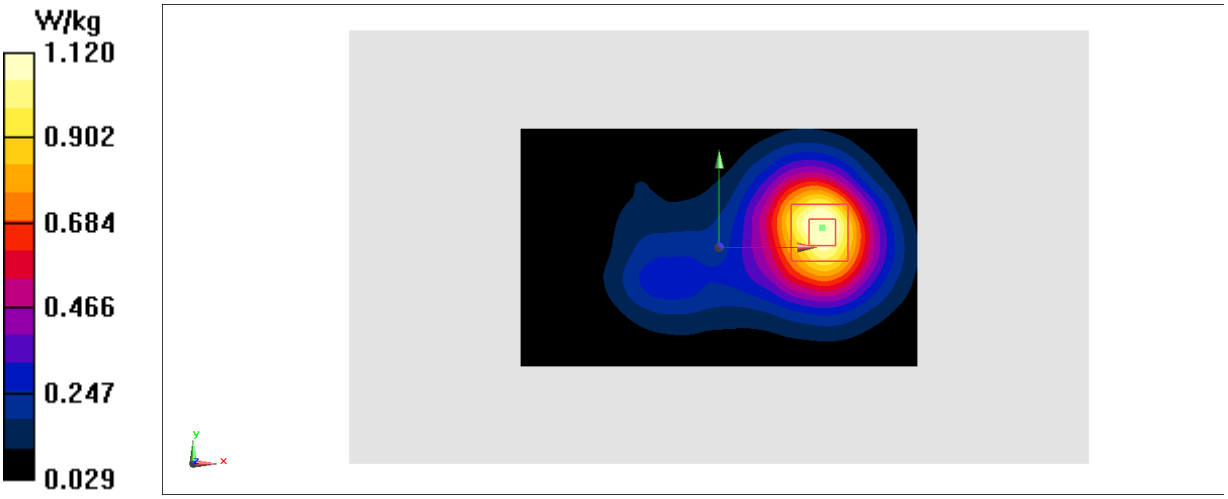


Fig.8 WCDMA1700

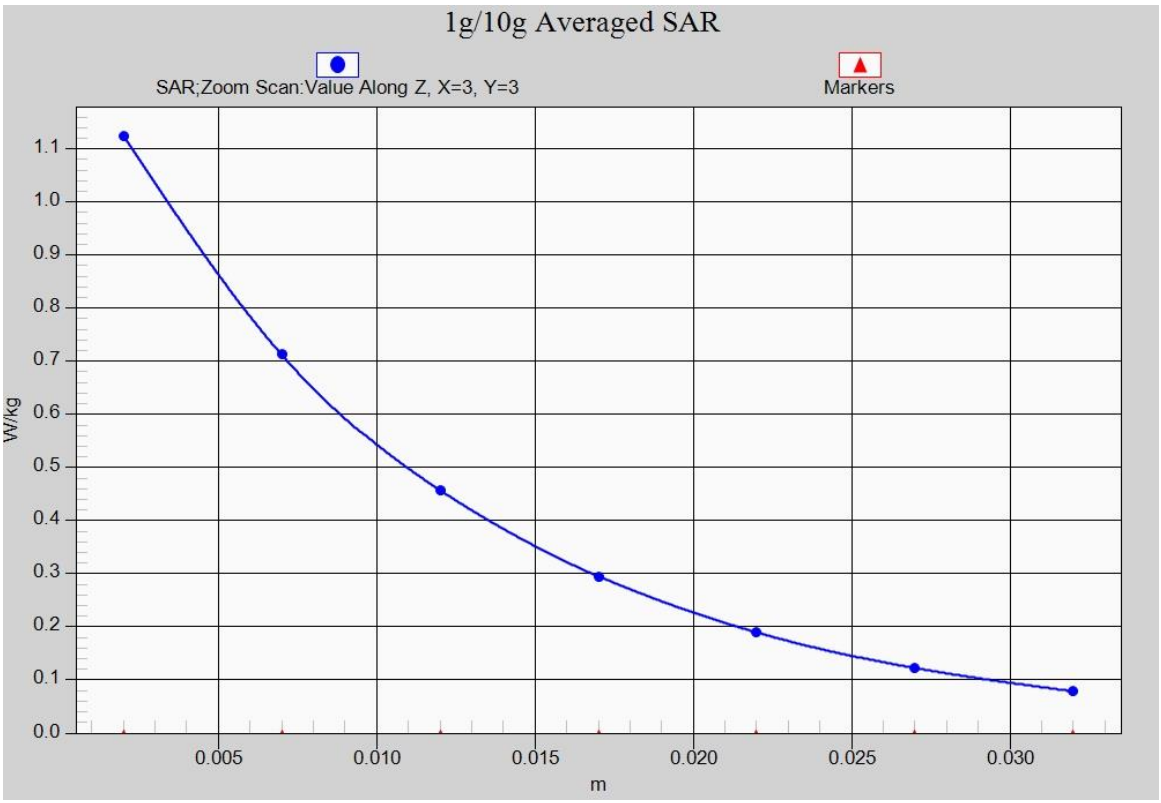


Fig. 8-1 Z-Scan at power reference point (WCDMA1700)

WCDMA850-BV_ Right Cheek High
Date: 2019/6/18
Electronics: DAE4 Sn1525
Medium: head 835 MHz
Medium parameters used: f = 846.6 MHz; σ = 0.925 mho/m; εr = 41.7; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA850-BV 846.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.09, 9.09, 9.09)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.659 W/kg

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

Reference Value = 0 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.782 W/kg
SAR(1 g) = 0.441 W/kg; SAR(10 g) = 0.289 W/kg
Maximum value of SAR (measured) = 0.600 W/kg

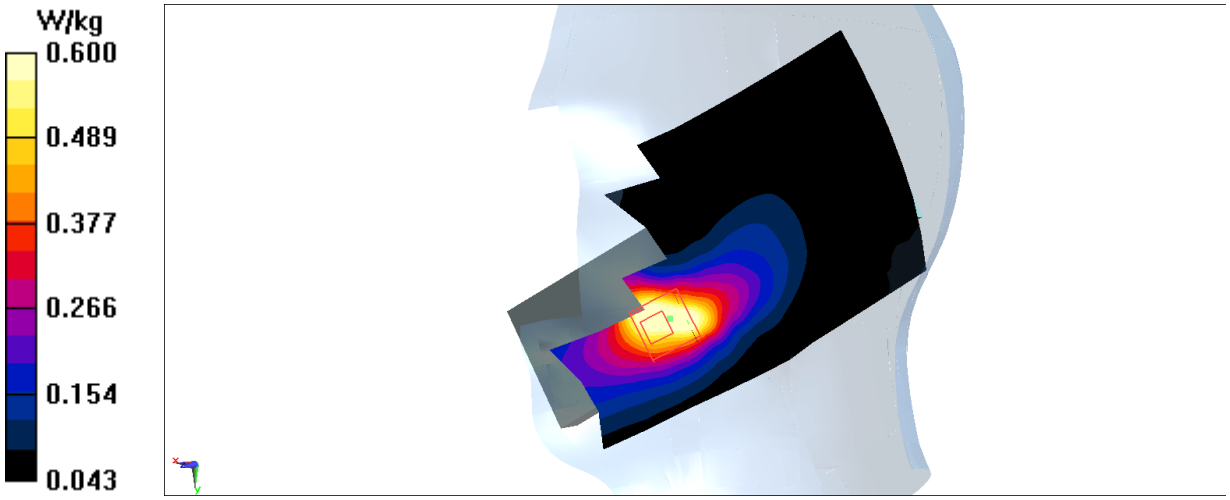


Fig.9 WCDMA 850

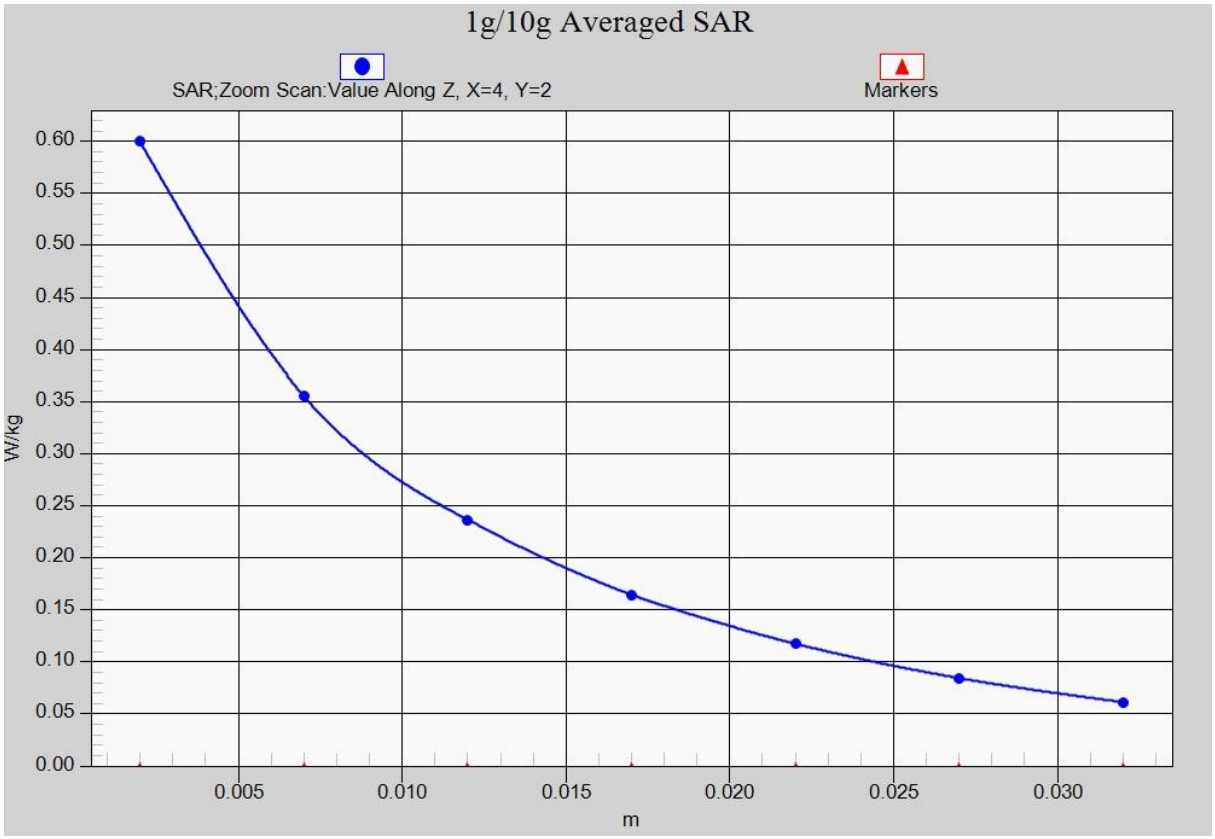


Fig. 9-1 Z-Scan at power reference point (WCDMA850)

WCDMA850-BV_Rear High
Date: 2019/6/18
Electronics: DAE4 Sn1525
Medium: body 835 MHz
Medium parameters used: f = 846.6 MHz; σ = 1.005 mho/m; εr = 55.8; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA850-BV 846.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.47, 9.47, 9.47)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.394 W/kg

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

Reference Value = 18.64 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.448 W/kg
SAR(1 g) = 0.317 W/kg; SAR(10 g) = 0.225 W/kg
Maximum value of SAR (measured) = 0.385 W/kg

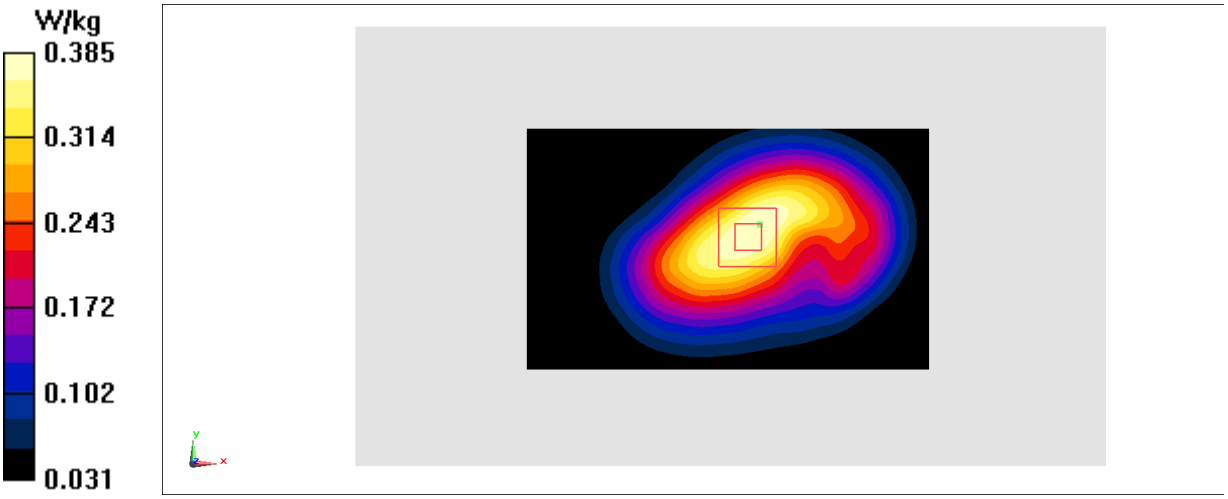


Fig.10 WCDMA 850

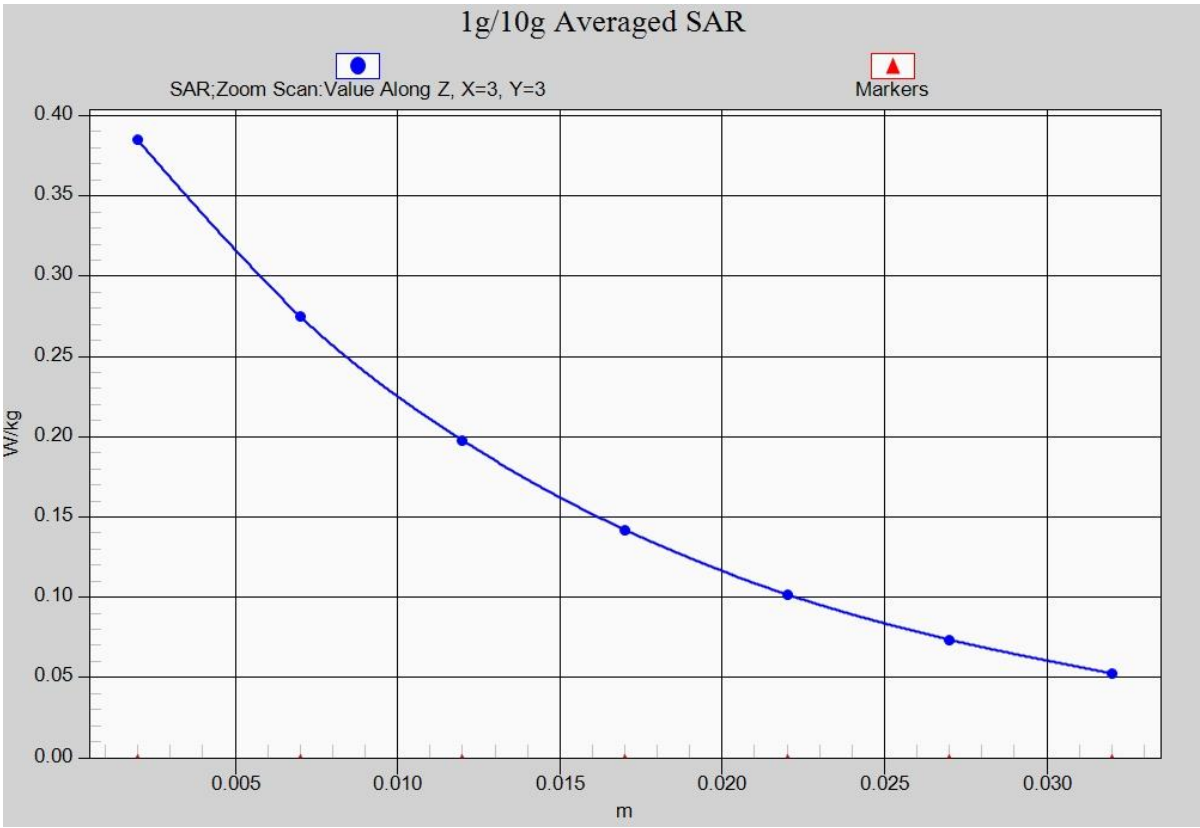


Fig. 10-1 Z-Scan at power reference point (WCDMA850)

LTE1900-FDD2_ Left Cheek Middle with QPSK_20M_1RB_Middle
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.393 mho/m; εr = 40.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.73, 7.73, 7.73)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.589 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.201 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.774 W/kg
SAR(1 g) = 0.489 W/kg; SAR(10 g) = 0.295 W/kg
Maximum value of SAR (measured) = 0.681 W/kg

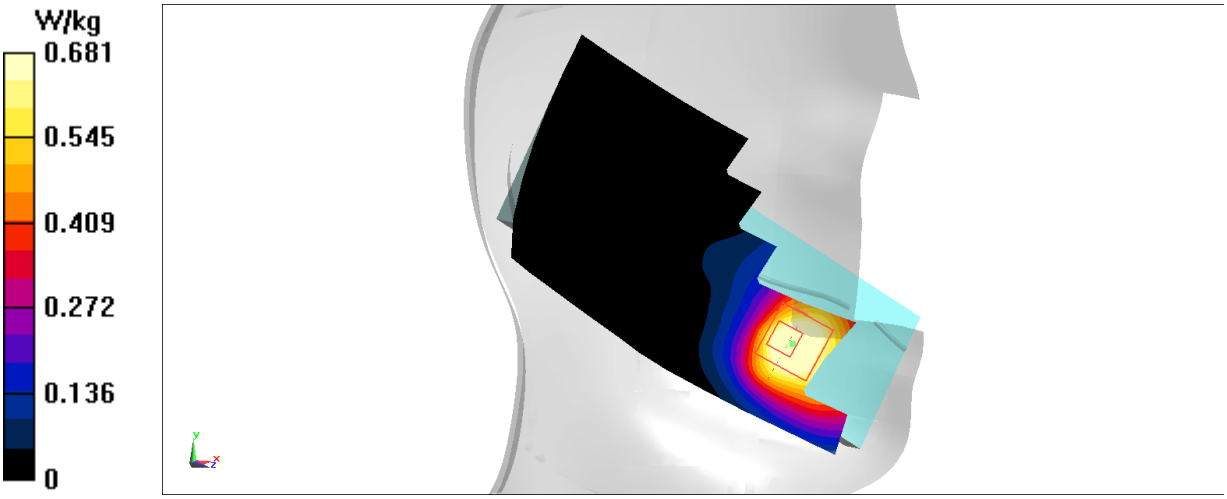


Fig.11 LTE Band2

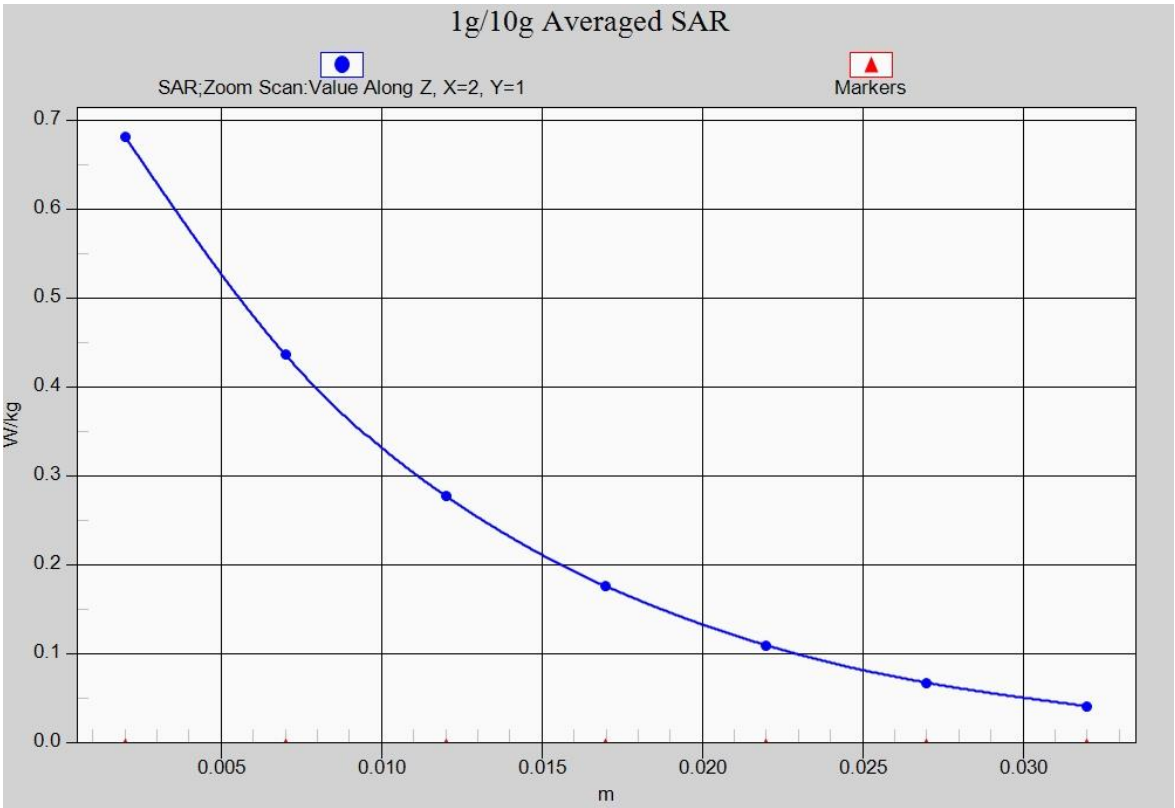


Fig. 11-1 Z-Scan at power reference point (LTE Band2)

LTE1900-FDD2_ Rear Middle with QPSK_20M_1RB_Middle
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.547 mho/m; εr = 52.24; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.53, 7.53, 7.53)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.967 W/kg

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

Reference Value = 11.06 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.664 W/kg; SAR(10 g) = 0.401 W/kg
Maximum value of SAR (measured) = 0.896 W/kg

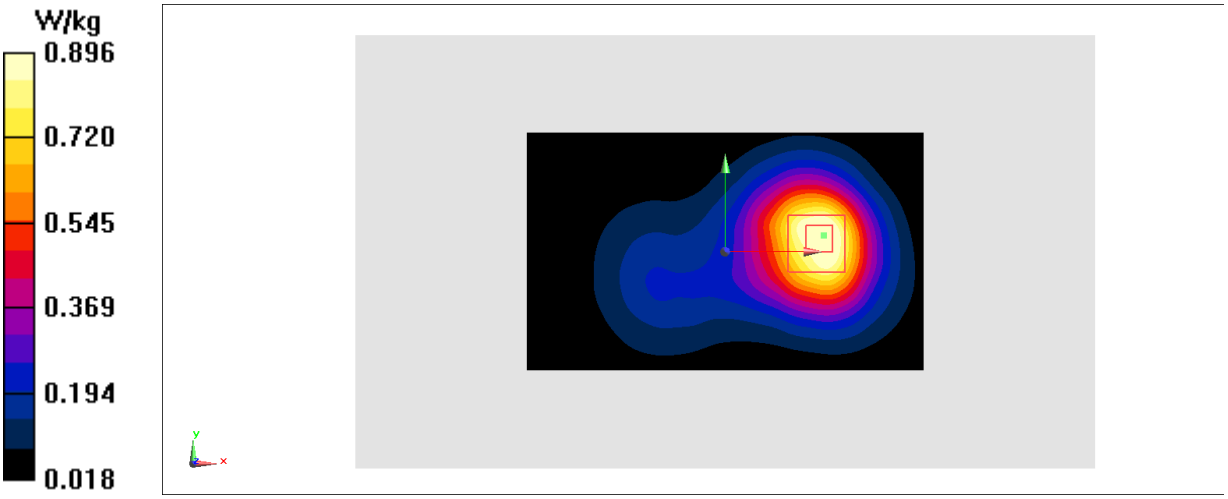


Fig.12 LTE Band2

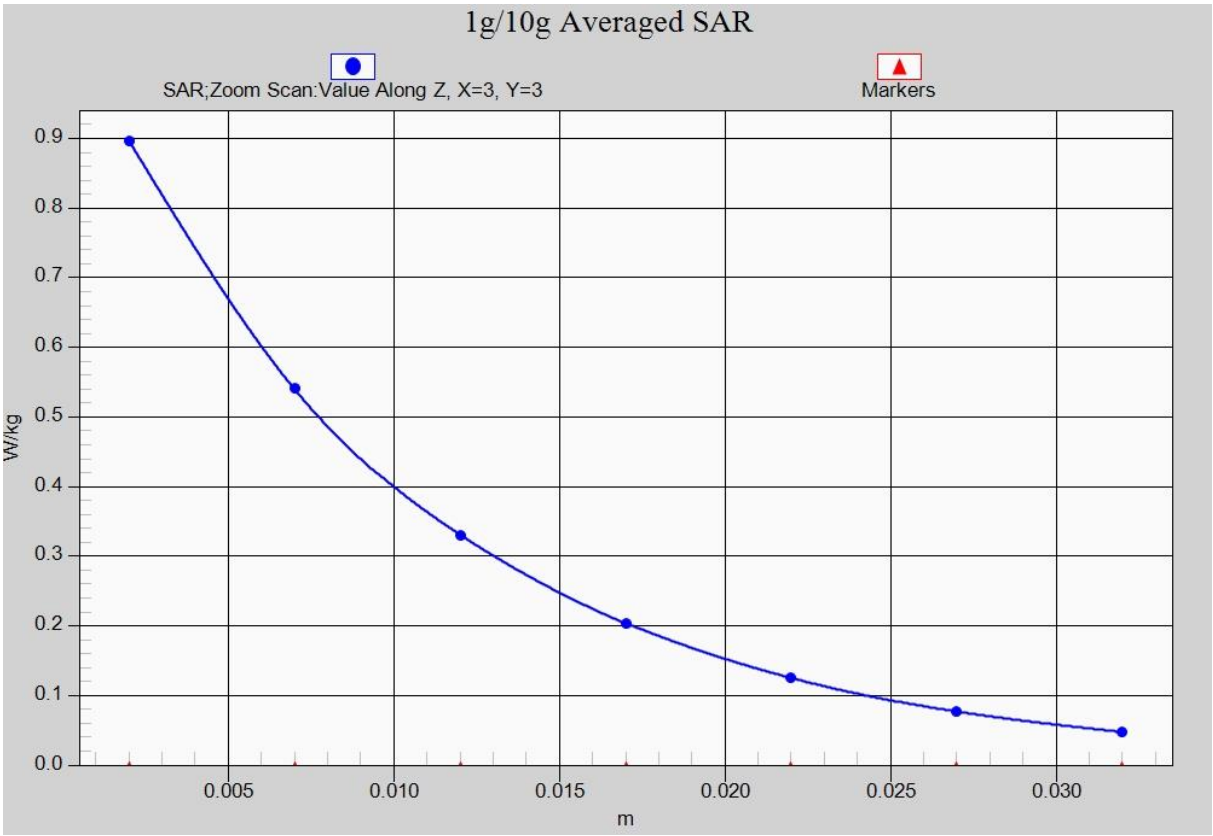


Fig. 12-1 Z-Scan at power reference point (LTE Band2)

LTE1700-FDD4_ Left Cheek High with QPSK_20M_1RB_Middle
Date: 2019/6/15
Electronics: DAE4 Sn1525
Medium: head 1750 MHz
Medium parameters used: f = 1745 MHz; σ = 1.395 mho/m; εr = 40.44; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(8.10, 8.10, 8.10)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.598 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.415 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.711 W/kg
SAR(1 g) = 0.489 W/kg; SAR(10 g) = 0.306 W/kg
Maximum value of SAR (measured) = 0.609 W/kg

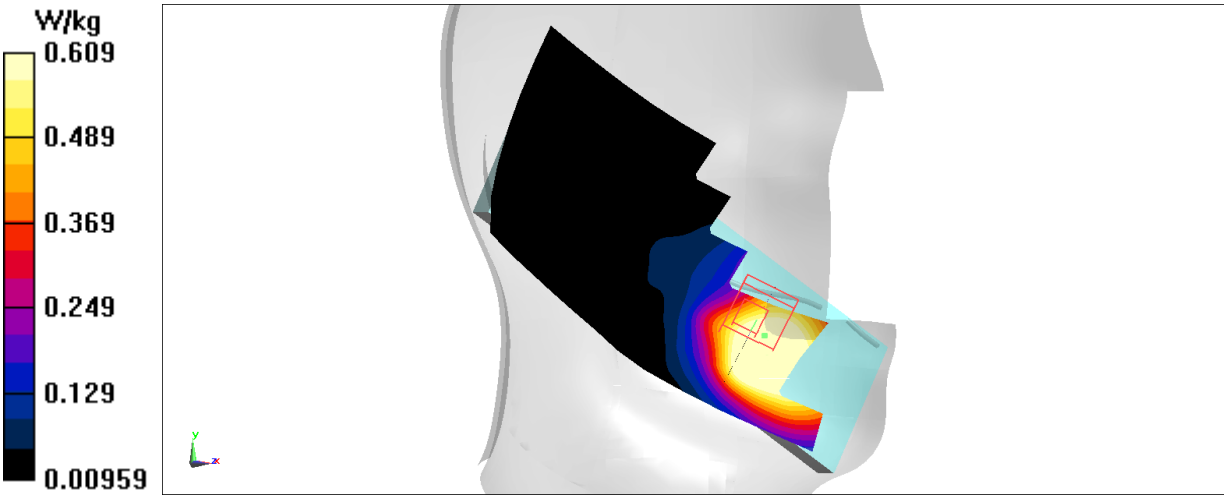


Fig.13 LTE Band4

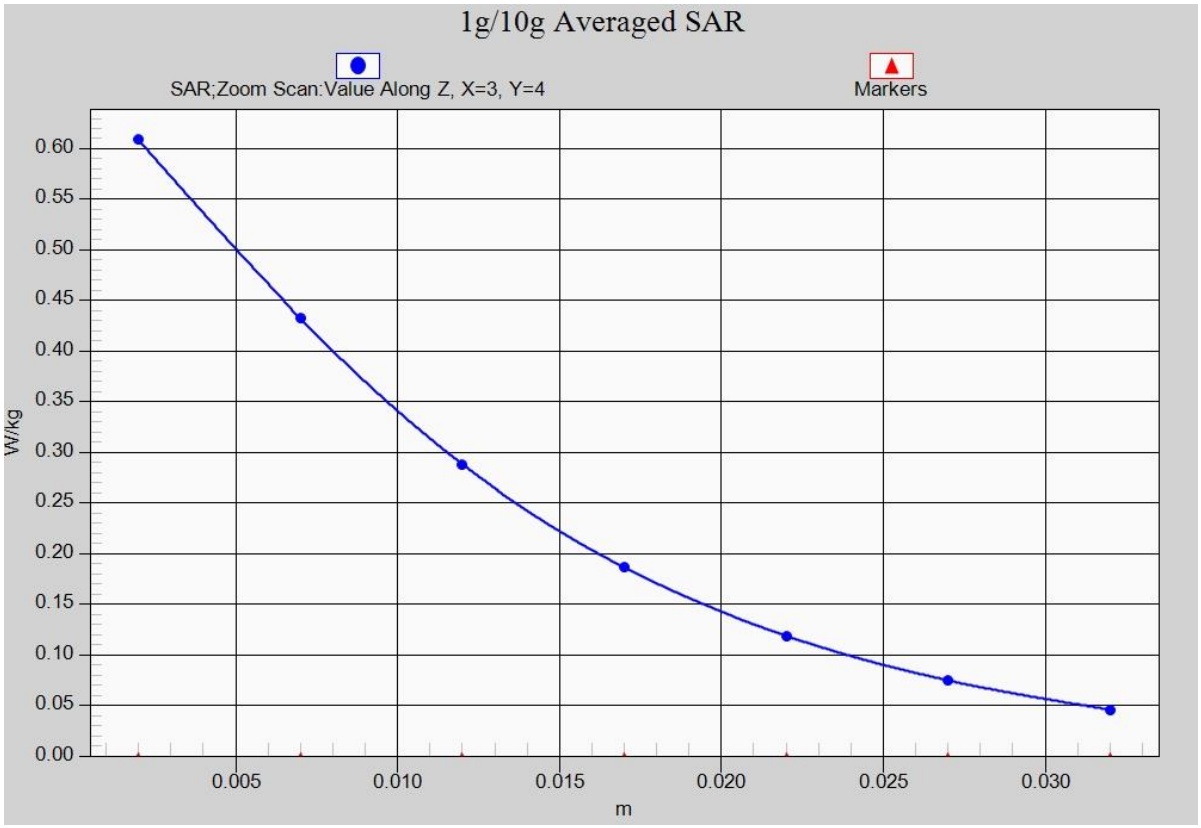


Fig. 13-1 Z-Scan at power reference point (LTE Band2)

LTE1700-FDD4_ Rear High with QPSK_20M_1RB_Middle
Date: 2019/6/15
Electronics: DAE4 Sn1525
Medium: body 1750 MHz
Medium parameters used: f = 1745 MHz; σ = 1.465 mho/m; εr = 54.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.82, 7.82, 7.82)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.04 W/kg

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

Reference Value = 12.29 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.753 W/kg; SAR(10 g) = 0.462 W/kg
Maximum value of SAR (measured) = 0.984 W/kg

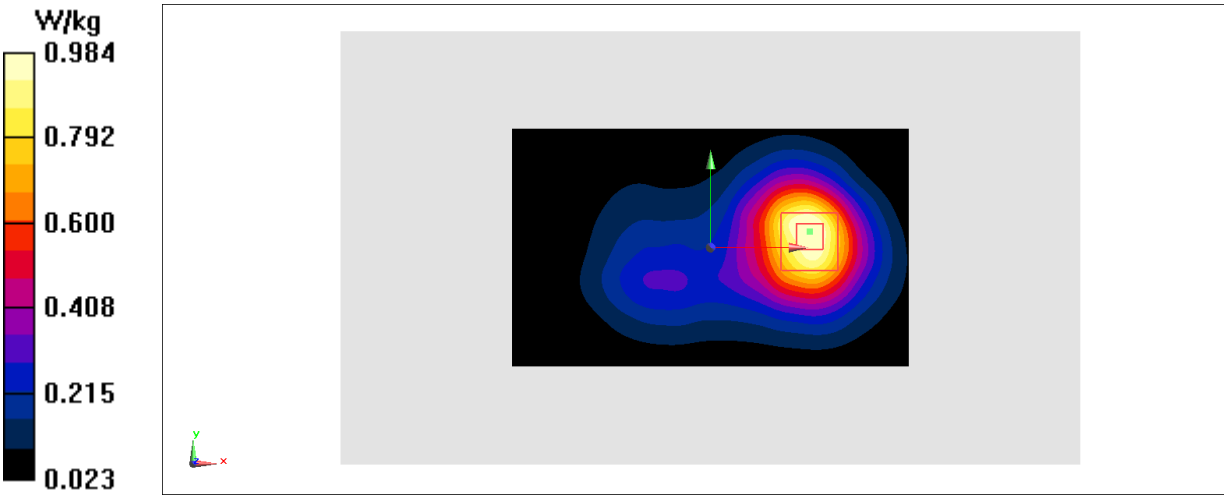


Fig.14 LTE Band4

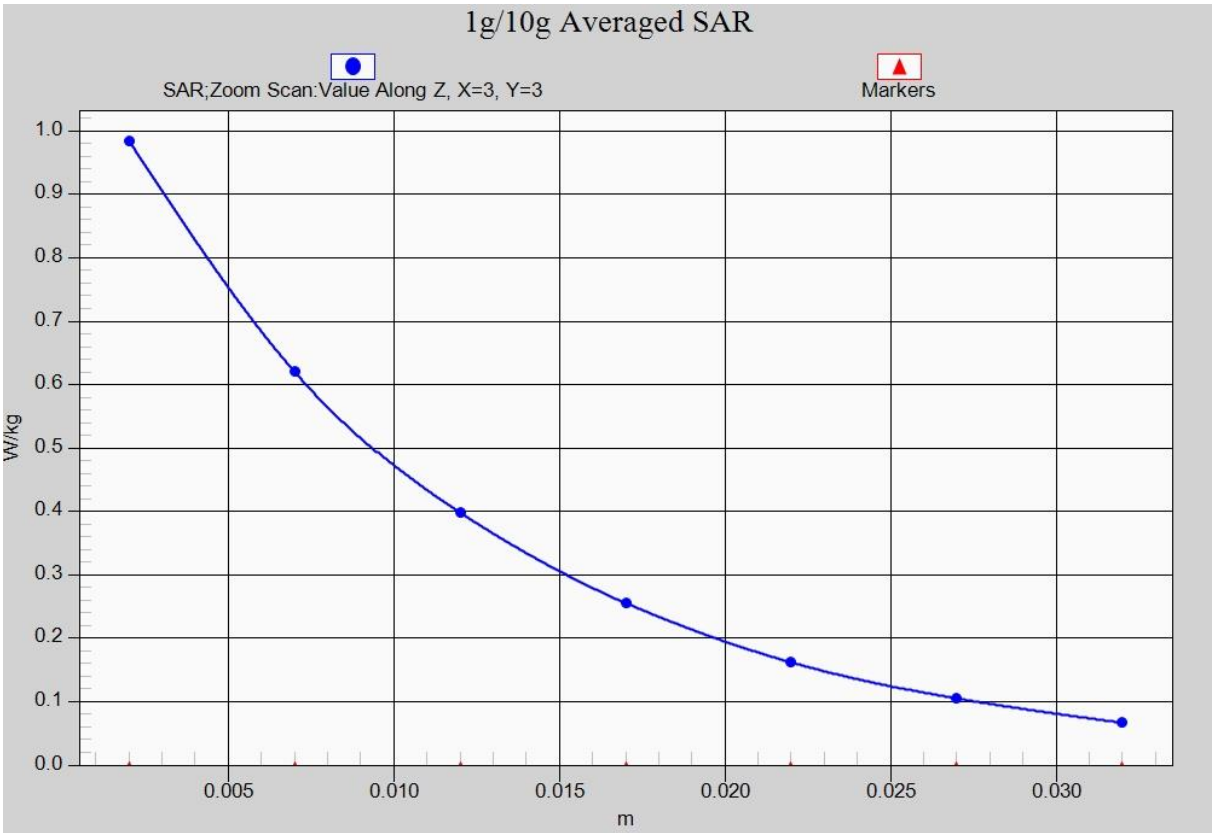


Fig. 14-1 Z-Scan at power reference point (LTE Band4)

LTE850-FDD5_ Right Cheek High with QPSK_10M_1RB_Middle
Date: 2019/6/18
Electronics: DAE4 Sn1525
Medium: head 835 MHz
Medium parameters used: f = 844 MHz; σ = 0.925 mho/m; εr = 41.69; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 844 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.09, 9.09, 9.09)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.529 W/kg

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

Reference Value = 5.483 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.618 W/kg
SAR(1 g) = 0.366 W/kg; SAR(10 g) = 0.243 W/kg
Maximum value of SAR (measured) = 0.475 W/kg

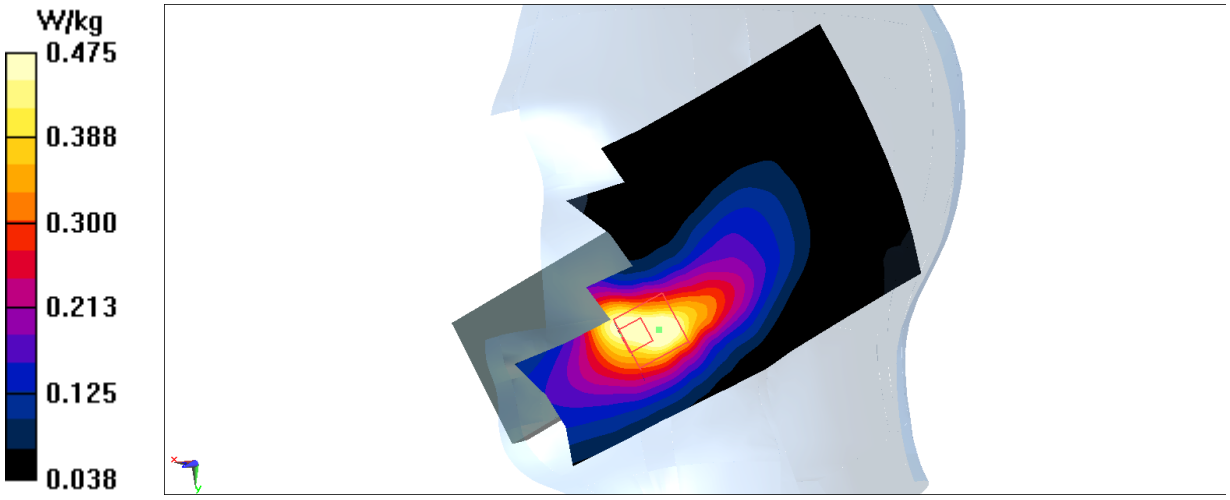


Fig.15 LTE Band5

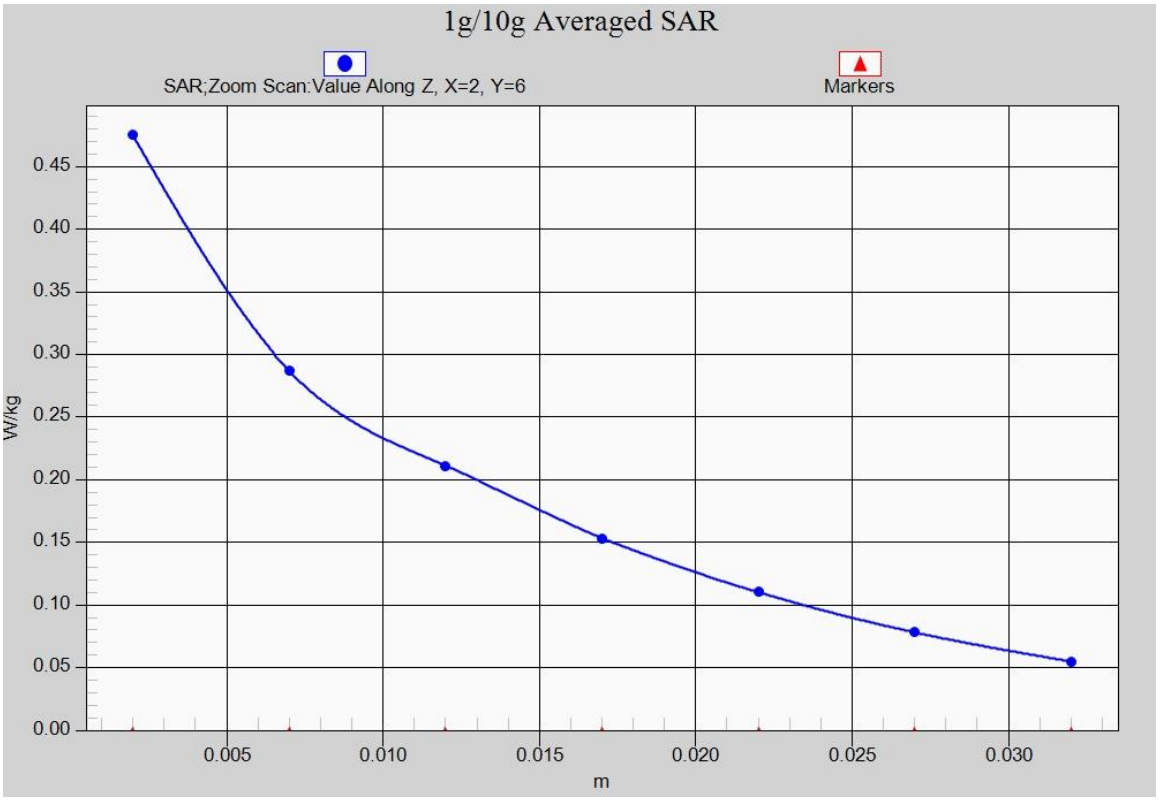


Fig. 15-1 Z-Scan at power reference point (LTE Band5)

LTE850-FDD5_ Rear High with QPSK_10M_1RB_Middle
Date: 2019/6/19
Electronics: DAE4 Sn1525
Medium: body 835 MHz
Medium parameters used: f = 844 MHz; σ = 1.004 mho/m; εr = 55.79; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 844 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.47, 9.47, 9.47)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.413 W/kg

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

Reference Value = 19.53 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.466 W/kg
SAR(1 g) = 0.341 W/kg; SAR(10 g) = 0.243 W/kg
Maximum value of SAR (measured) = 0.408 W/kg

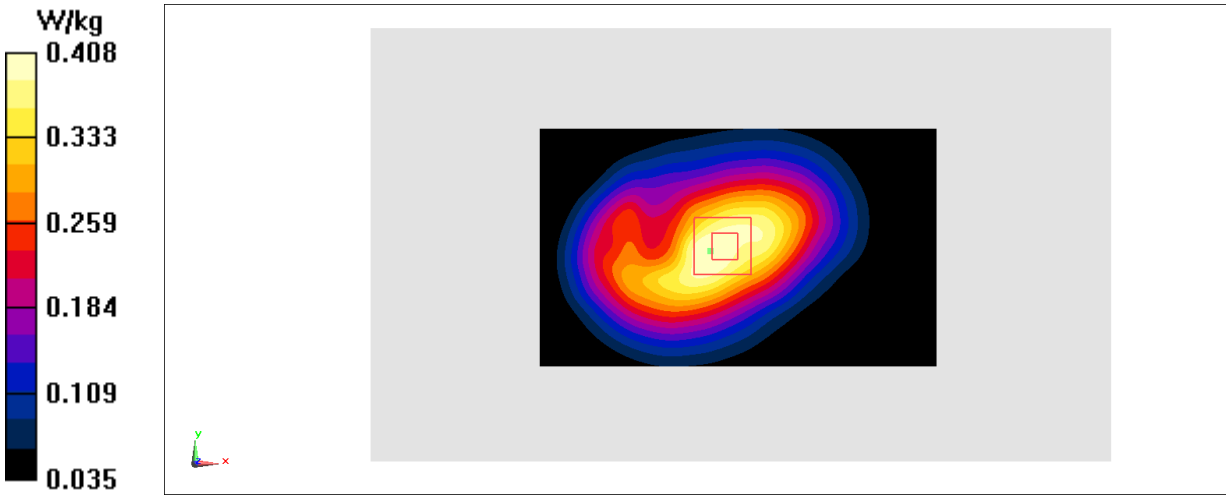


Fig.16 LTE Band5

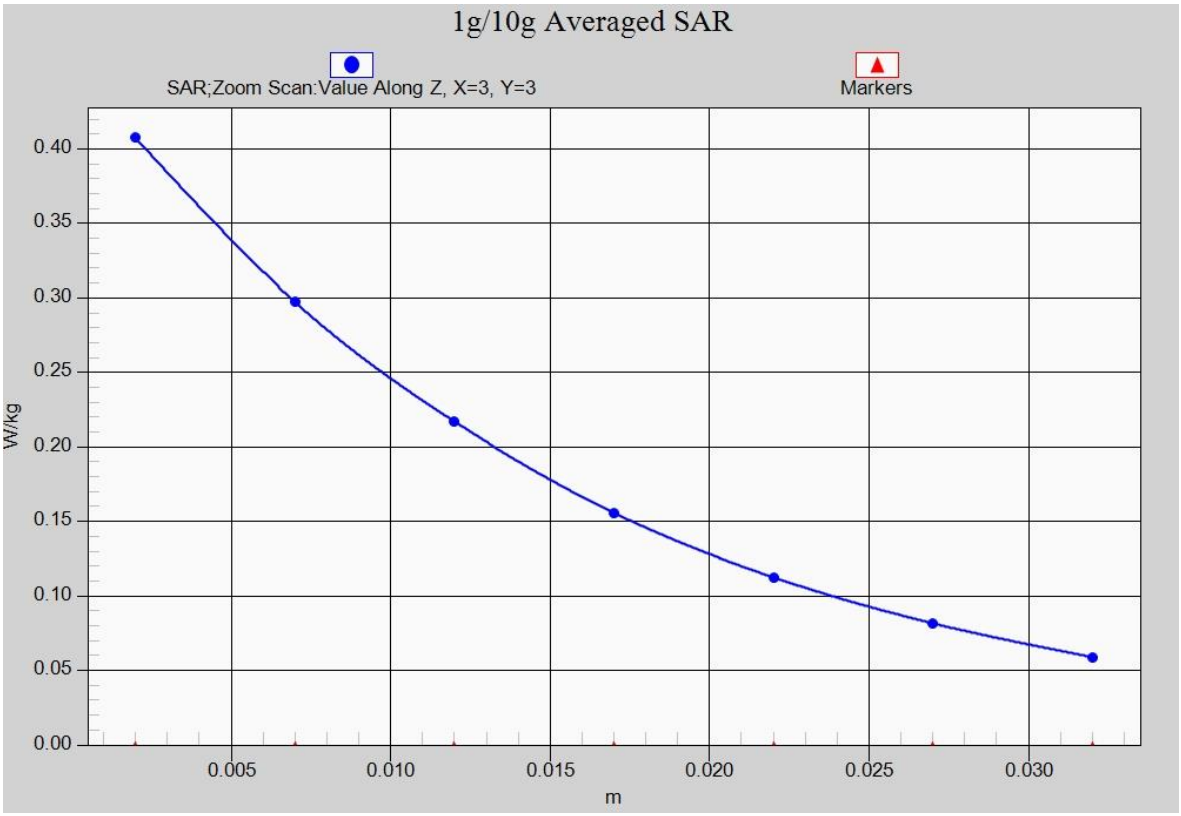


Fig. 16-1 Z-Scan at power reference point (LTE Band5)

LTE700-FDD12_ Right Cheek Low with QPSK_10M_1RB_Middle
Date: 2019/6/14
Electronics: DAE4 Sn1525
Medium: head 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.87 mho/m; εr = 42.47; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD12 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.47, 9.47, 9.47)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.647 W/kg

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

Reference Value = 2.393 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.870 W/kg
SAR(1 g) = 0.417 W/kg; SAR(10 g) = 0.257 W/kg
Maximum value of SAR (measured) = 0.603 W/kg

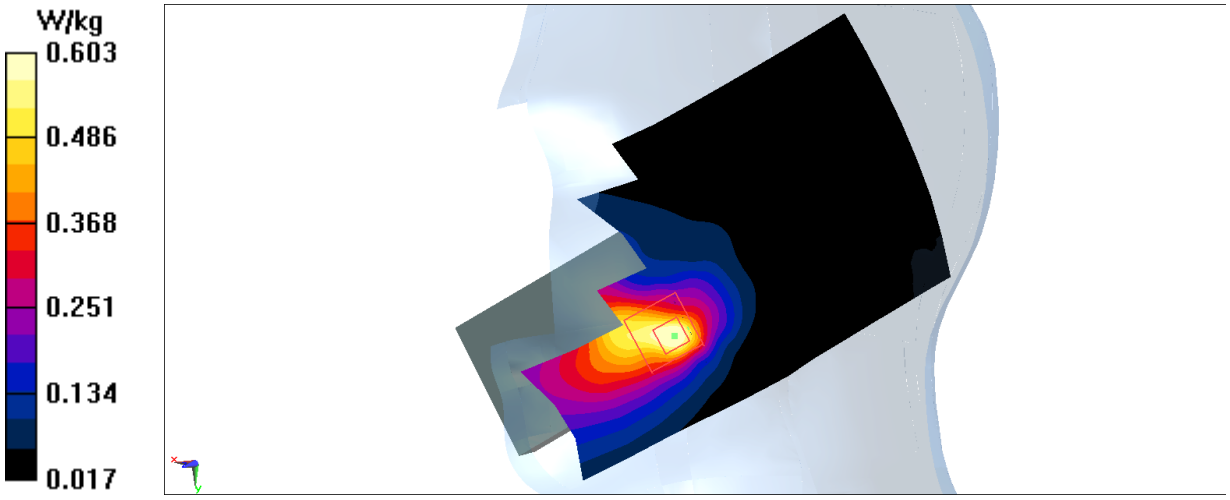


Fig.17 LTE Band12

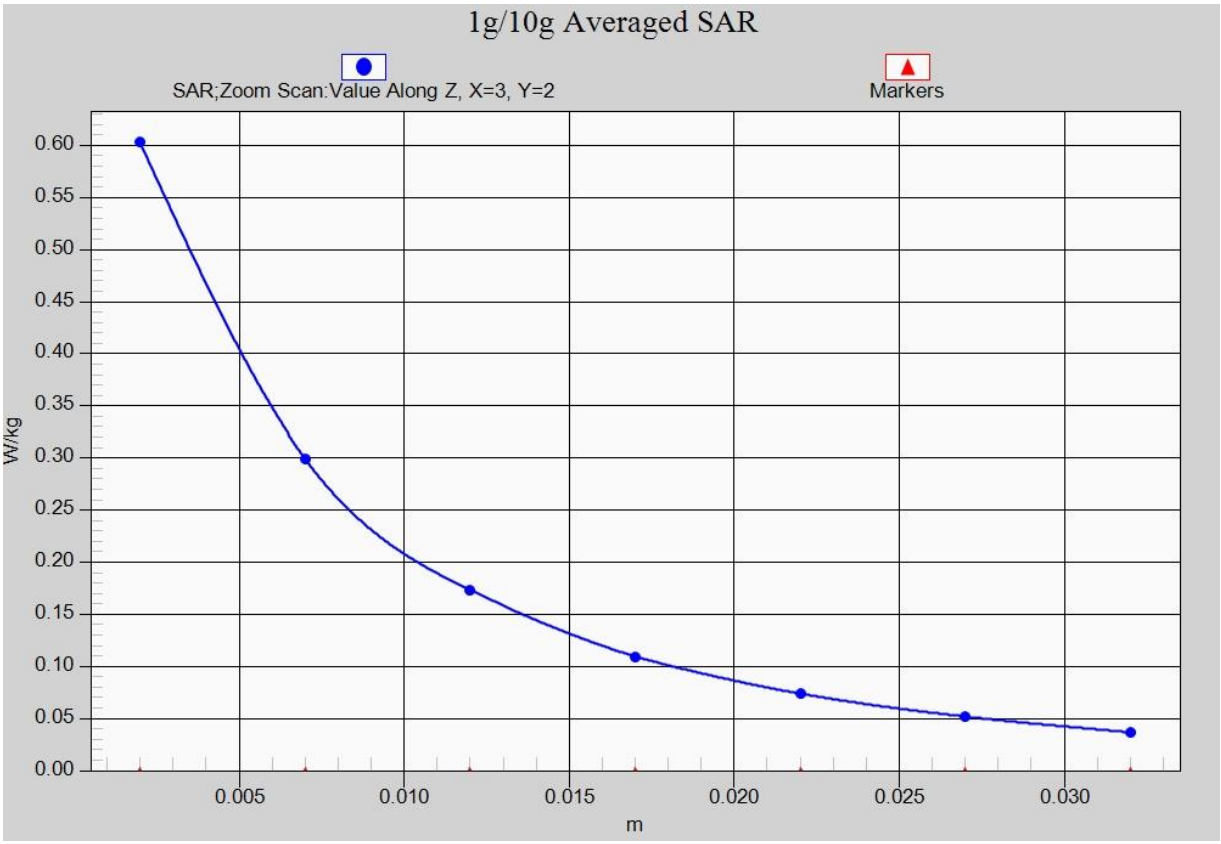


Fig. 17-1 Z-Scan at power reference point (LTE Band12)

LTE700-FDD12_ Rear Middle with QPSK_10M_1RB_Middle
Date: 2019/6/14
Electronics: DAE4 Sn1525
Medium: body 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.975 mho/m; εr = 54.60; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD12 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.68, 9.68, 9.68)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.597 W/kg

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

Reference Value = 21.64 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.669 W/kg
SAR(1 g) = 0.474 W/kg; SAR(10 g) = 0.331 W/kg
Maximum value of SAR (measured) = 0.575 W/kg

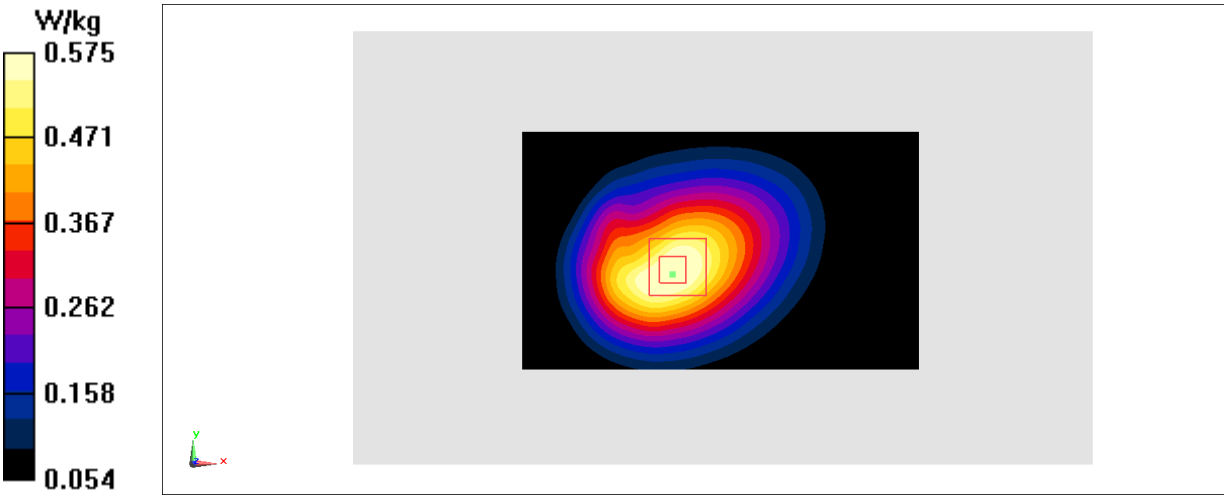


Fig.18 LTE Band12

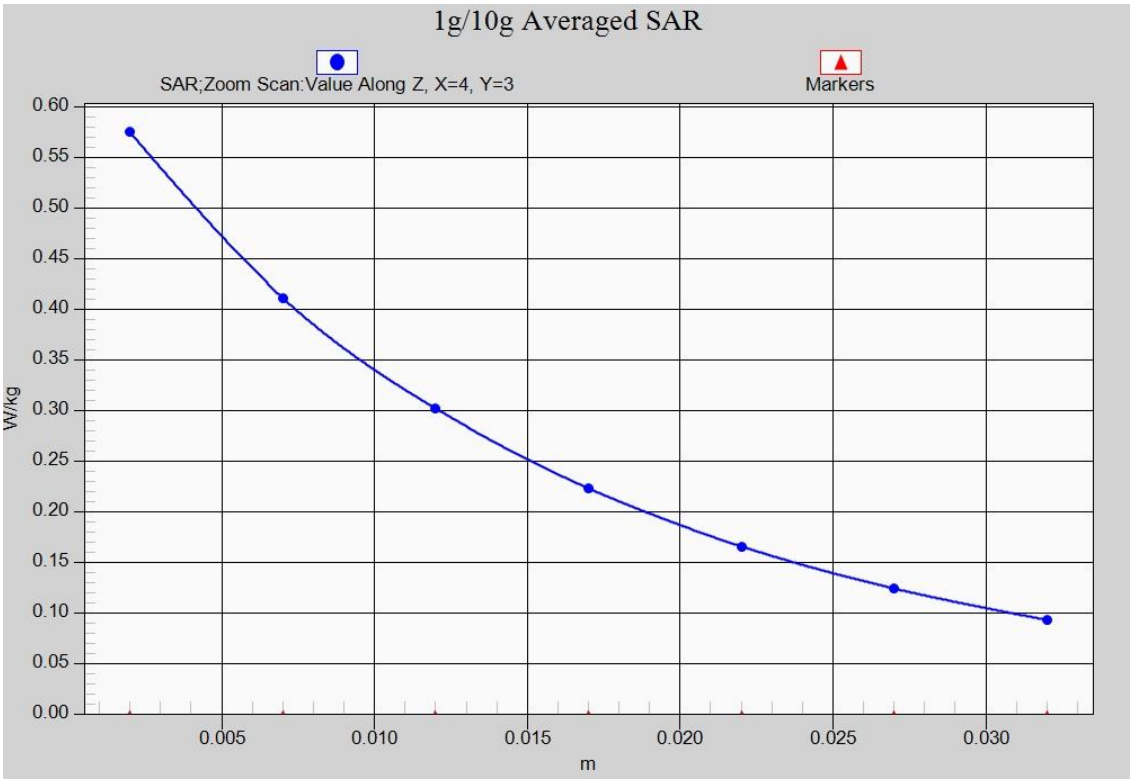


Fig. 18-1 Z-Scan at power reference point (LTE Band12)

LTE700-FDD14_ Left Cheek with QPSK_10M_1RB_High
Date: 2019/6/14
Electronics: DAE4 Sn1525
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.875 mho/m; εr = 42.38; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.47, 9.47, 9.47)

Area Scan (71x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.636 W/kg

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

Reference Value = 5.262 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.795 W/kg
SAR(1 g) = 0.564 W/kg; SAR(10 g) = 0.34 W/kg
Maximum value of SAR (measured) = 0.658 W/kg

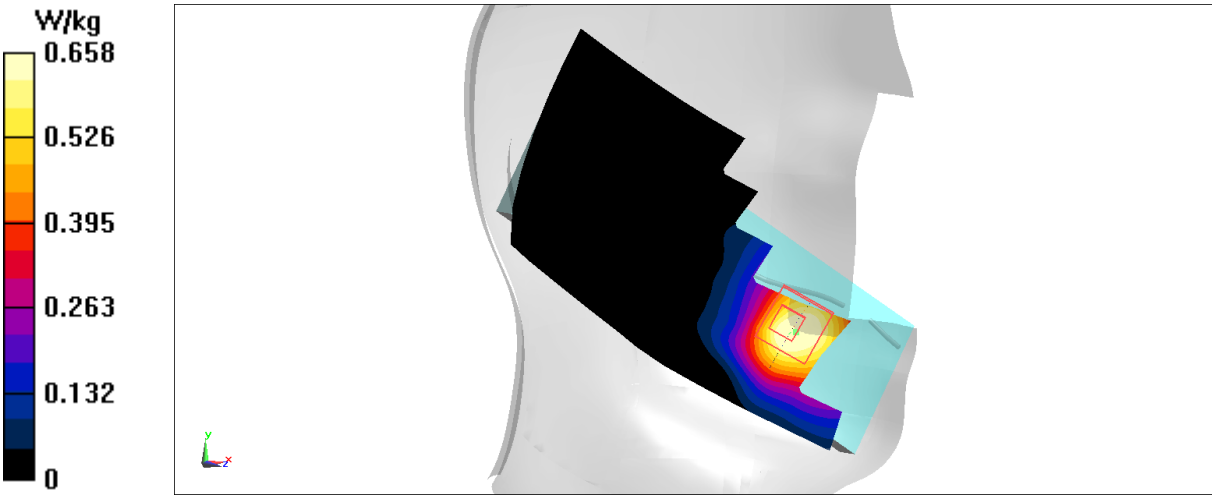


Fig.19 LTE Band14

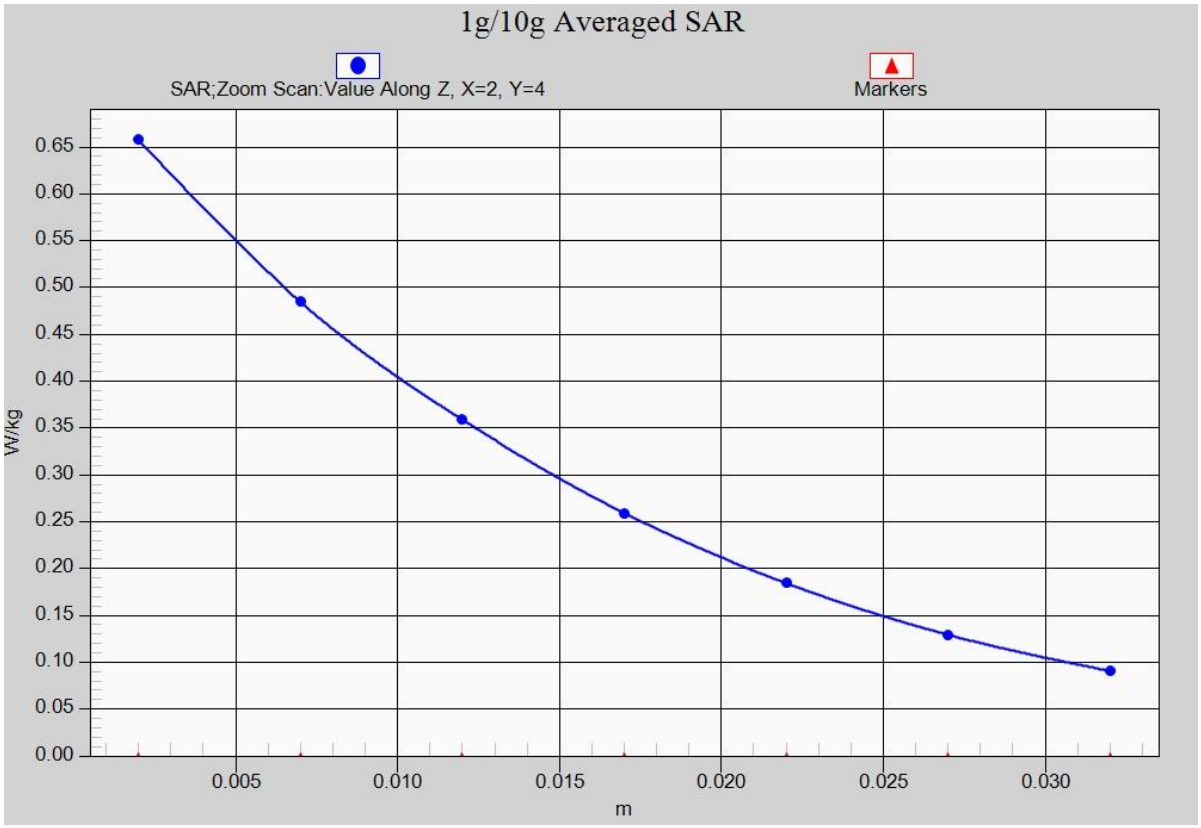


Fig. 19-1 Z-Scan at power reference point (LTE Band14)

LTE700-FDD14_ Rear with QPSK_10M_1RB_High
Date: 2019/6/14
Electronics: DAE4 Sn1525
Medium: body 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.976 mho/m; εr = 54.56; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(9.68, 9.68, 9.68)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.643 W/kg

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

Reference Value = 21.97 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.765 W/kg
SAR(1 g) = 0.532 W/kg; SAR(10 g) = 0.365 W/kg
Maximum value of SAR (measured) = 0.654 W/kg

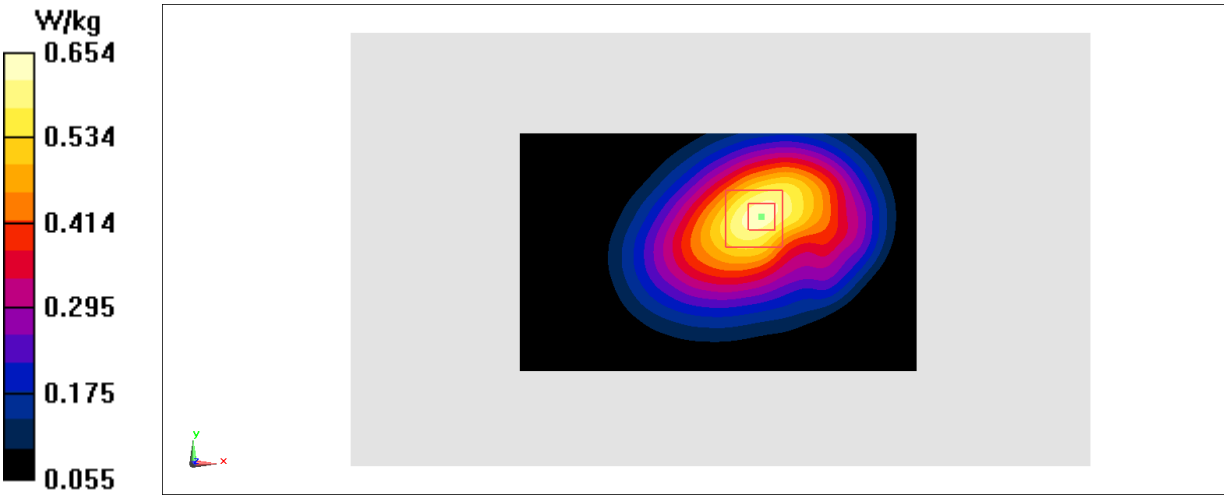


Fig.20 LTE Band14

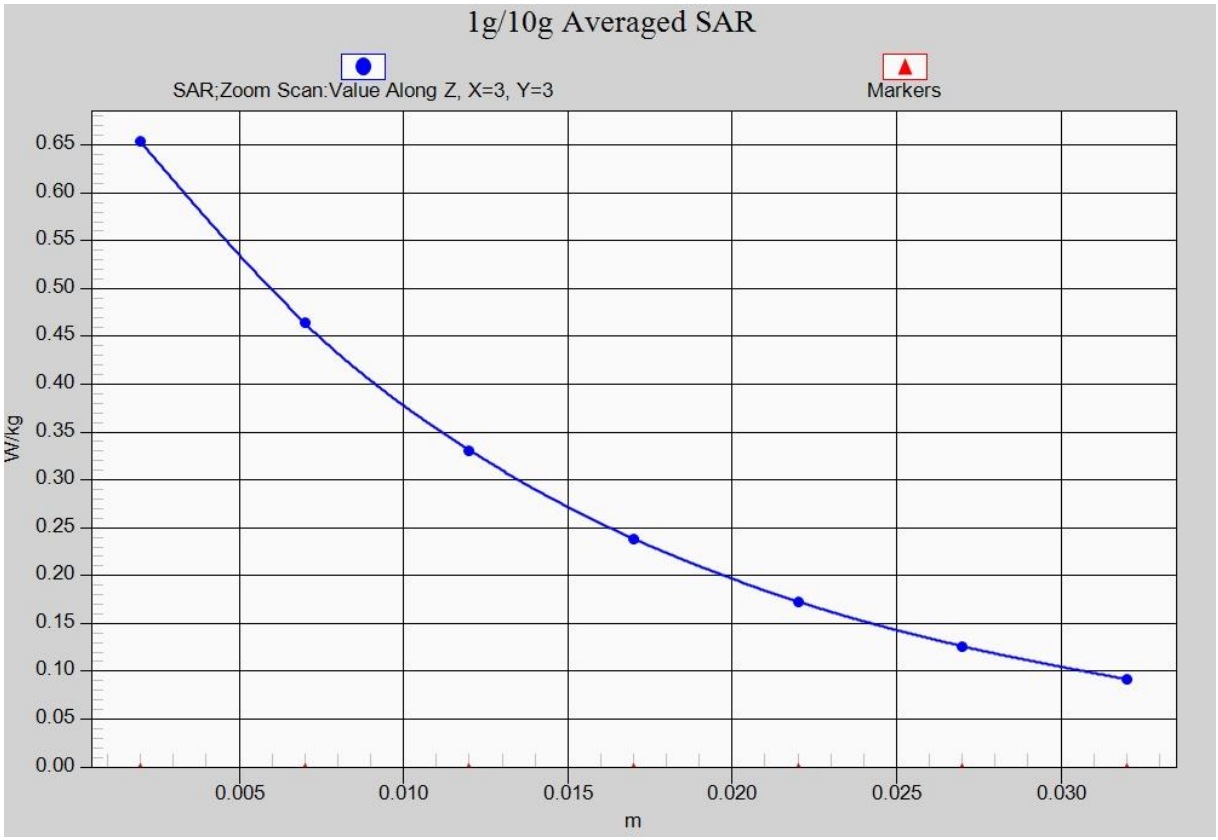


Fig. 20-1 Z-Scan at power reference point (LTE Band14)

WLAN2450_CH6 Right Cheek
Date: 2019/6/16
Electronics: DAE4 Sn1525
Medium: head 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.798 mho/m; εr = 38.89; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WLAN2450 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(6.95, 6.95, 6.95)

Area Scan (91x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.606 W/kg

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

Reference Value = 3.280 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.962 W/kg
SAR(1 g) = 0.475 W/kg; SAR(10 g) = 0.235 W/kg
Maximum value of SAR (measured) = 0.724 W/kg

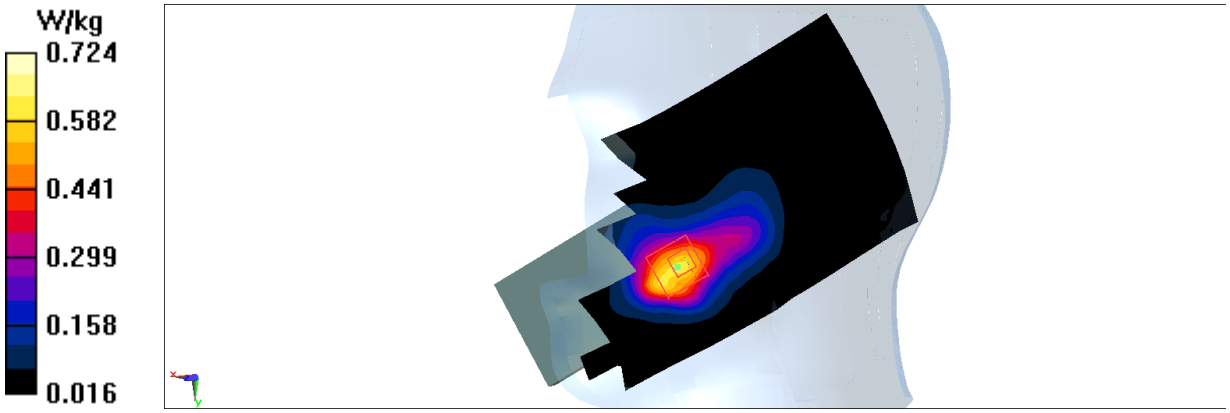


Fig.21 2450 MHz

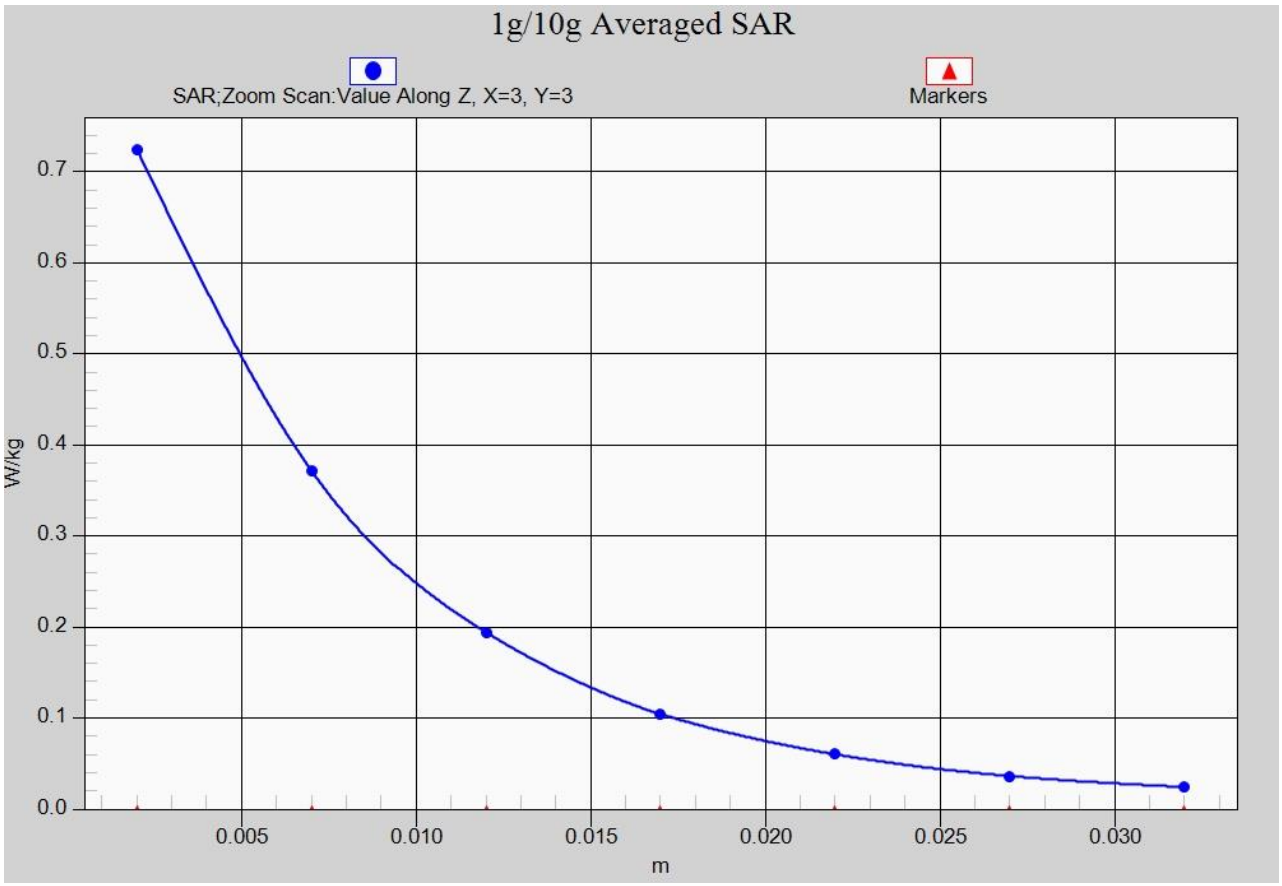


Fig. 21-1 Z-Scan at power reference point (2450 MHz)

WLAN2450_CH6 Rear unfold
Date: 2019/6/16
Electronics: DAE4 Sn1525
Medium: body 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.923 mho/m; εr = 51.88; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WLAN2450 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 –SN7514 ConvF(7.13, 7.13, 7.13)

Area Scan (171x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.219 W/kg

Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.663 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.168 W/kg; SAR(10 g) = 0.105 W/kg
Maximum value of SAR (measured) = 0.222 W/kg

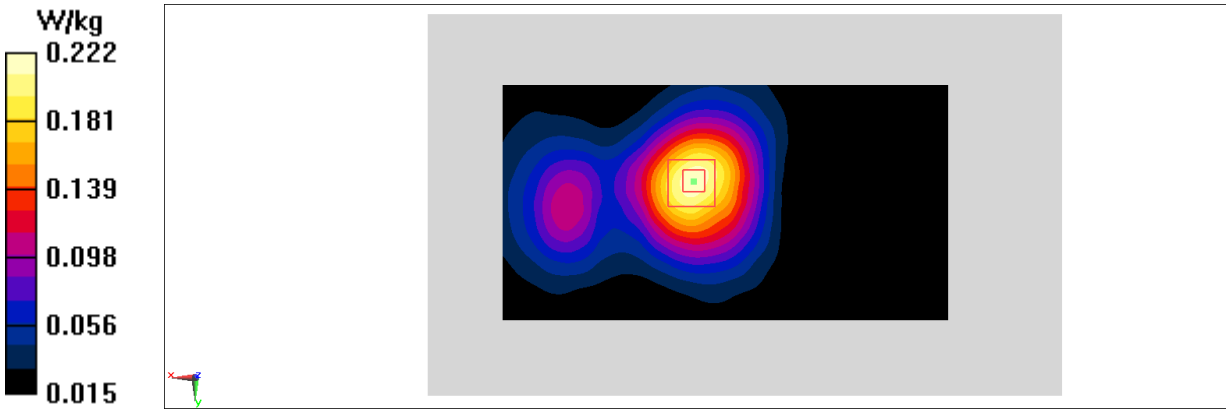


Fig.22 2450 MHz

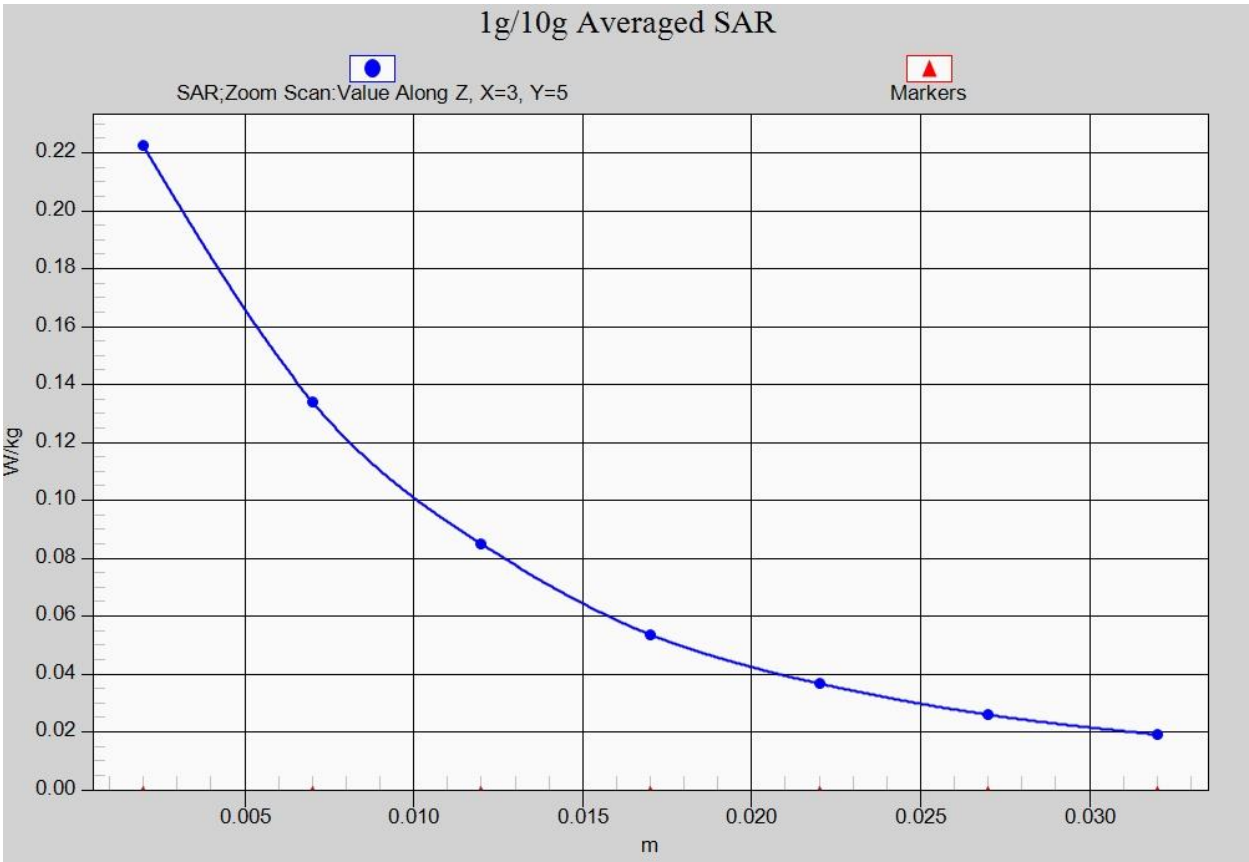


Fig. 2421 Z-Scan at power reference point (2450 MHz)

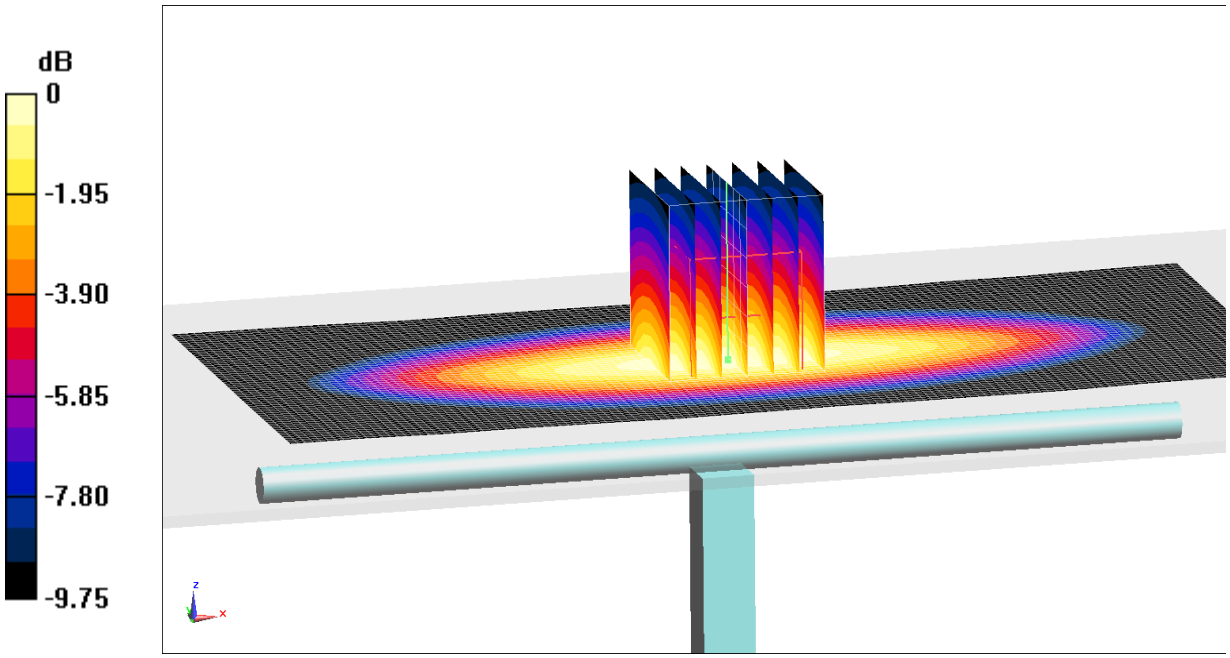
ANNEX B System Verification Results

750MHz

Date: 2019-6-14
Electronics: DAE4 Sn1525
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.875 mho/m; ε_r = 42.51; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(9.47, 9.47, 9.47)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 49.45 V/m; Power Drift = 0.05 dB
Fast SAR: SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.38 W/kg
Maximum value of SAR (interpolated) = 2.21 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 49.45 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.86 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (measured) = 2.19 W/kg



0 dB = 2.19 W/kg = 3.40 dB W/kg

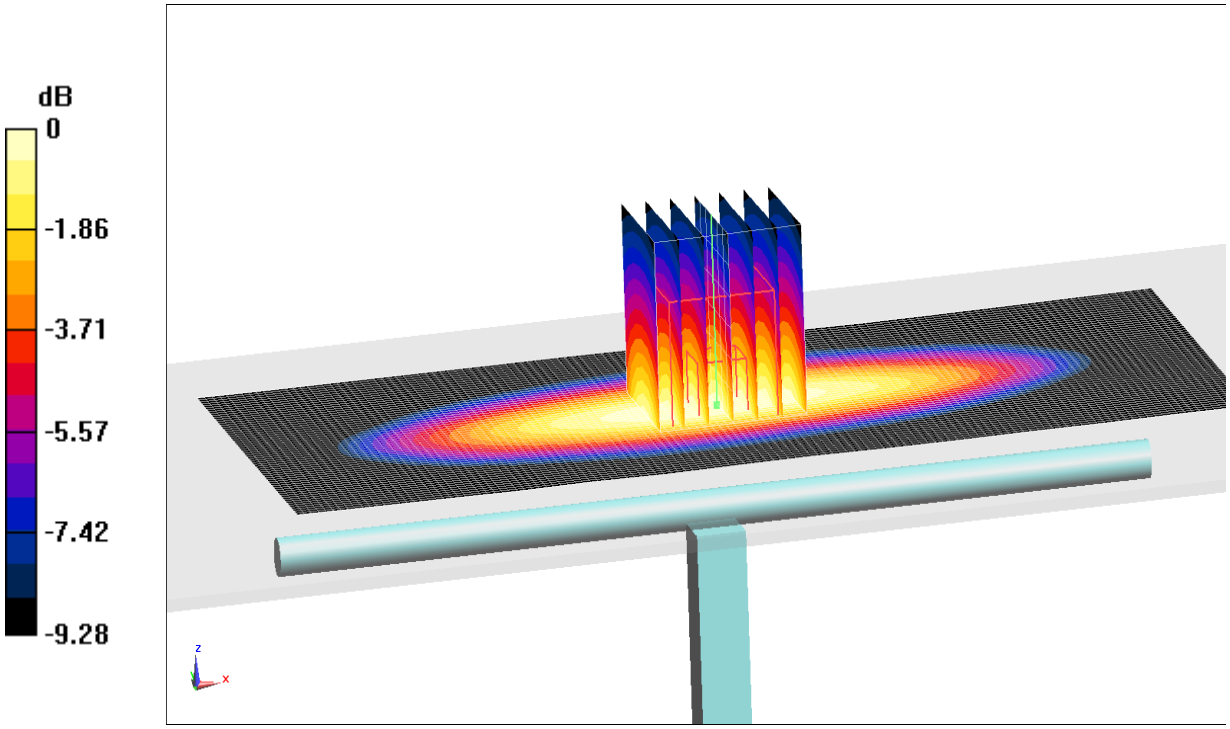
Fig.B.1 validation 750MHz 250mW

750MHz

Date: 2019-6-14
Electronics: DAE4 Sn1525
Medium: Body750 MHz
Medium parameters used: f = 750 MHz; σ = 0.976 mho/m; ε_r = 54.98; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(9.68, 9.68, 9.68)

System Validation/Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 51.669 V/m; Power Drift = -0.05 dB
Fast SAR: SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (interpolated) = 2.41 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.669 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.06 W/kg
SAR(1 g) = 2.19 W/kg; SAR(10 g) = 1.44 W/kg
Maximum value of SAR (measured) = 2.43 W/kg



0 dB = 2.43 W/kg = 3.86 dB W/kg

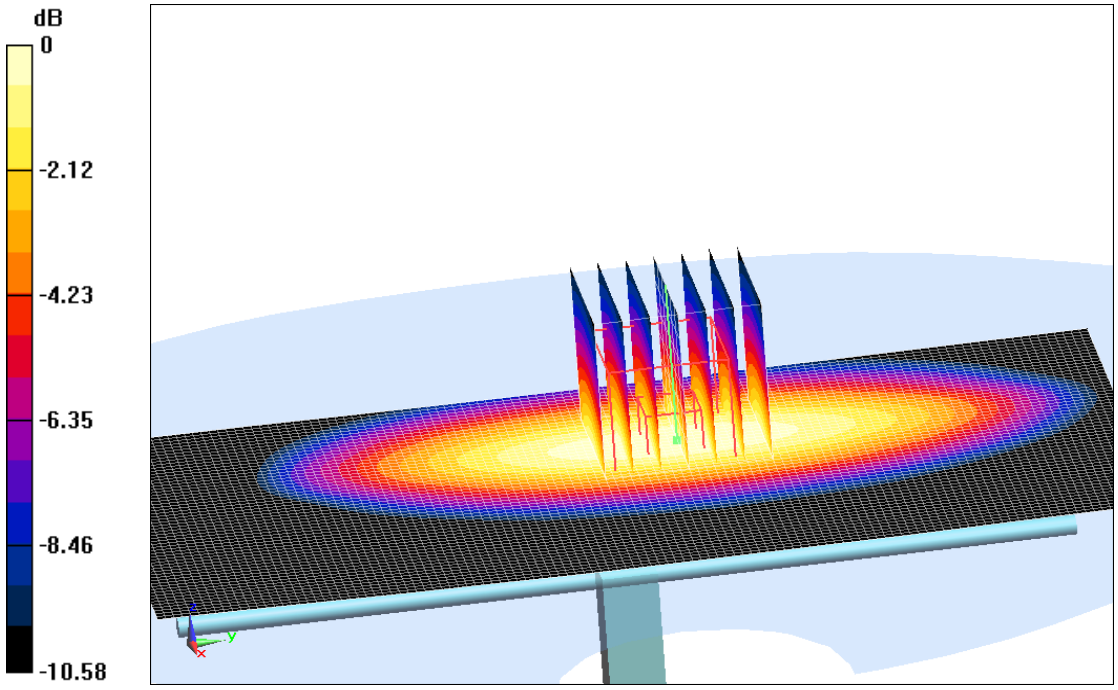
Fig.B.2 validation 750MHz 250mW

835MHz

Date: 2019-6-18
Electronics: DAE4 Sn1525
Medium: Head 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.916 S/m; ε_r = 41.83; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(9.09, 9.09, 9.09)

System Validation/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 54.22 V/m; Power Drift = -0.05 dB
Fast SAR: SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.49 W/kg
Maximum value of SAR (interpolated) = 2.53 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.22 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.06 W/kg
SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.48 W/kg
Maximum value of SAR (measured) = 2.51 W/kg



0 dB = 2.51 W/kg = 4 dBW/kg

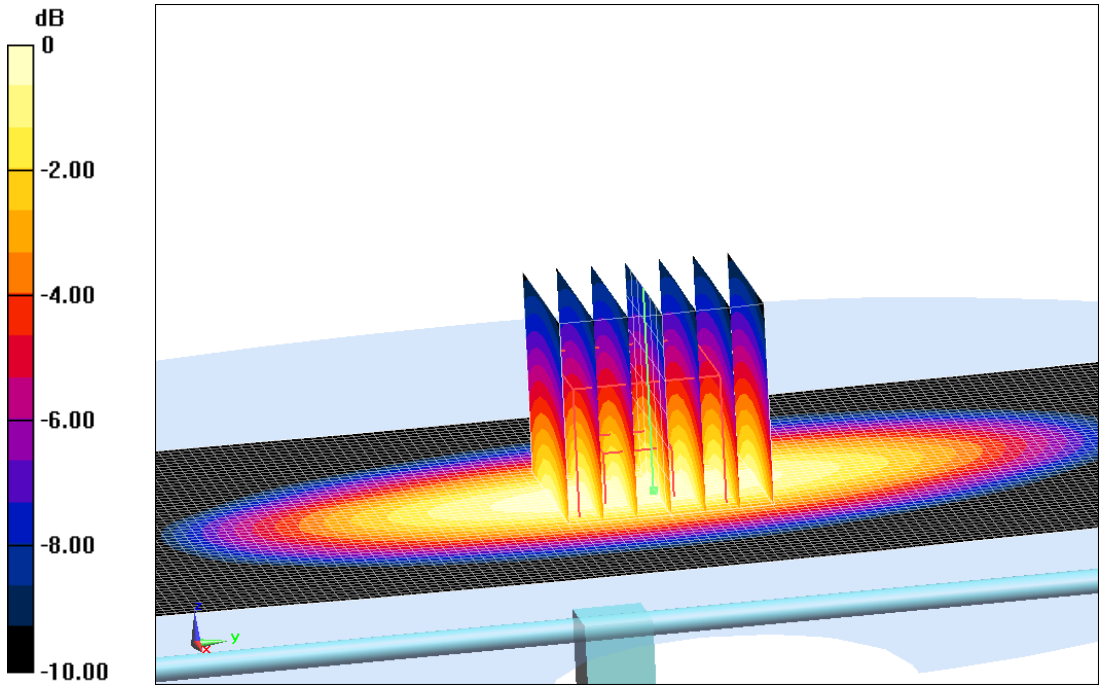
Fig.B.1 validation 835MHz 250Mw

835MHz

Date: 2019-6-18
Electronics: DAE4 Sn1525
Medium: Body 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.995 S/m; ε_r = 55.9; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(9.47, 9.47, 9.47)

System Validation /Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 52.74 V/m; Power Drift = 0.02 dB
Fast SAR: SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (interpolated) = 2.72 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.74 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.15 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 2.75 W/kg



0 dB = 2.75 W/kg = 4.39 dBW/kg

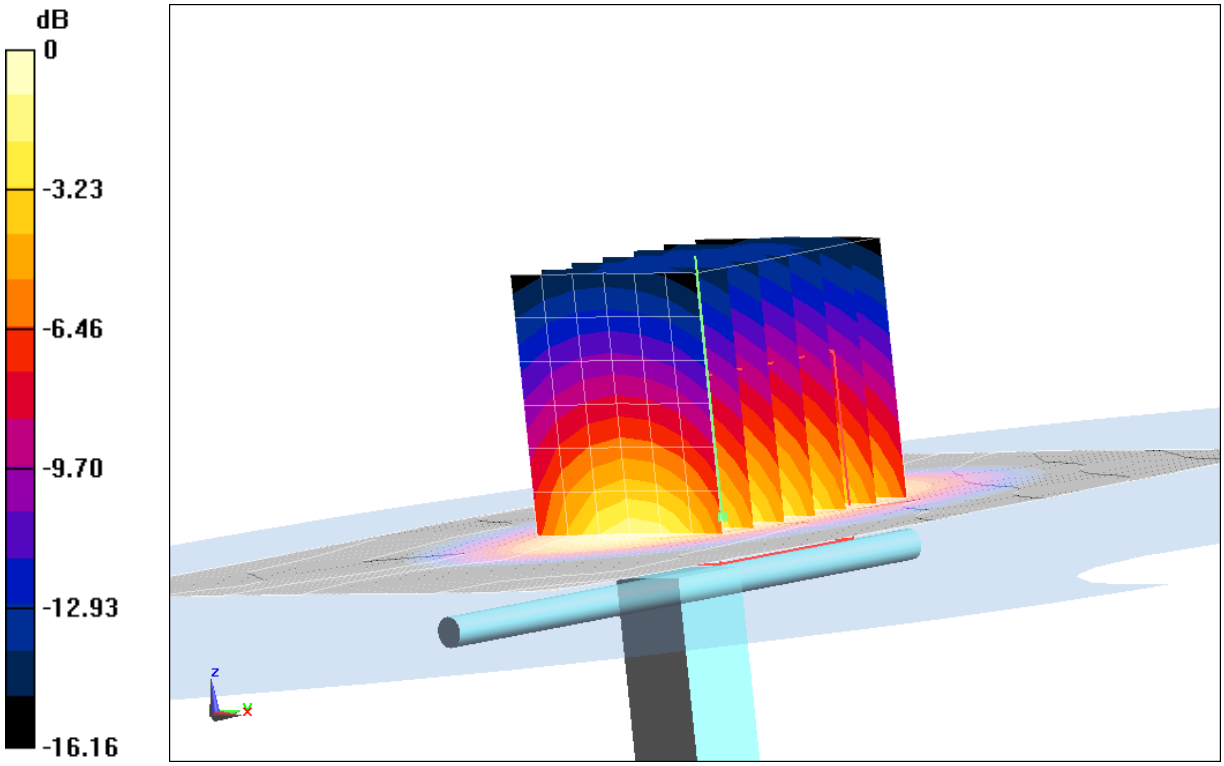
Fig.B.2 validation 835MHz 250mW

1750MHz

Date: 2019-6-15
Electronics: DAE4 Sn1525
Medium: Head 1750 MHz
Medium parameters used: f=1750 MHz; σ = 1.386 mho/m; εr = 40.49; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(8.10, 8.10, 8.10)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 89.61 V/m; Power Drift = 0.06 dB
Fast SAR: SAR(1 g) = 9.08 W/kg; SAR(10 g) = 4.80 W/kg
Maximum value of SAR (interpolated) = 10.0 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.61 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 15.59 W/kg
SAR(1 g) = 9.18 W/kg; SAR(10 g) = 4.86 W/kg
Maximum value of SAR (measured) = 10.1 W/kg



0 dB = 10.1 W/kg = 10.04 dB W/kg

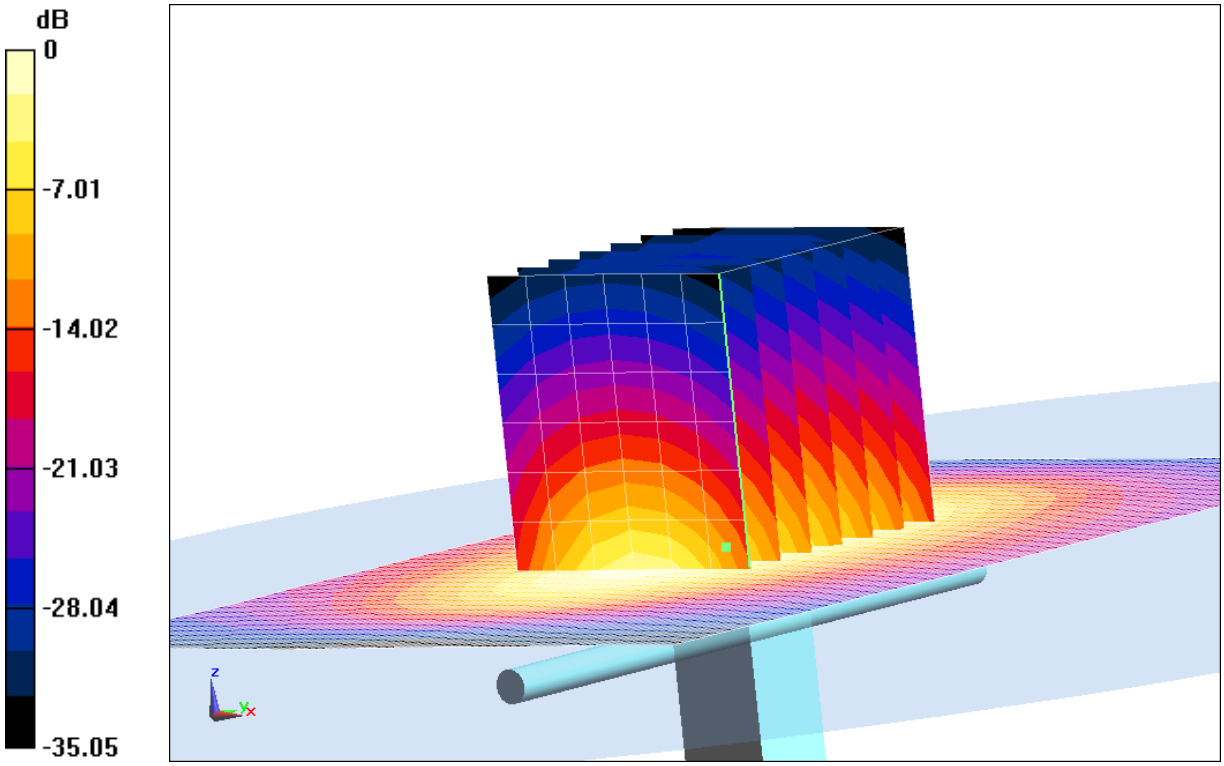
Fig.B.5 validation 1750MHz 250mW

1750MHz

Date: 2019-6-15
Electronics: DAE4 Sn1525
Medium: Body 1750 MHz
Medium parameters used: f=1750 MHz; σ = 1.456 mho/m; εr = 54.4; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(7.82, 7.82, 7.82)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 95.17 V/m; Power Drift = -0.03 dB
Fast SAR: SAR(1 g) = 9.51 W/kg; SAR(10 g) = 5.07 W/kg
Maximum value of SAR (interpolated) = 10.4 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.17 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 15.54 W/kg
SAR(1 g) = 9.42 W/kg; SAR(10 g) = 4.98 W/kg
Maximum value of SAR (measured) = 10.3 W/kg



0 dB = 10.3 W/kg = 10.13 dB W/kg

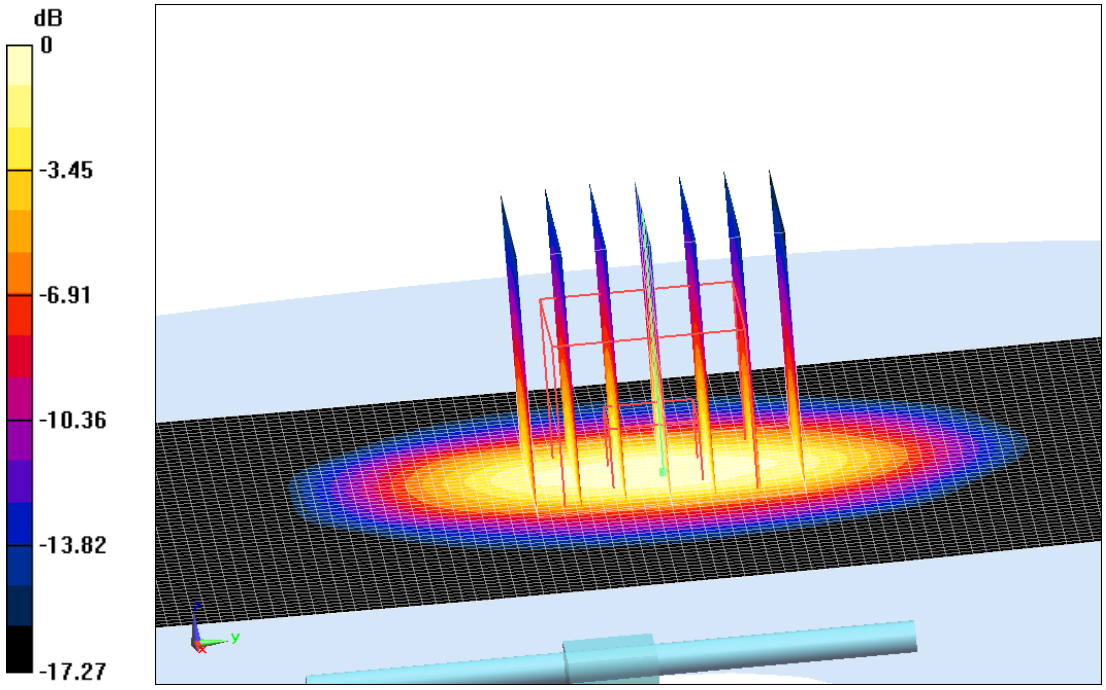
Fig.B.6 validation 1750MHz 250mW

1900MHz

Date: 2019-6-19
Electronics: DAE4 Sn1525
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.393 mho/m; ε_r = 40.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF (7.73, 7.73, 7.73)

System Validation /Area Scan(61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 93.1 V/m; Power Drift = 0.03 dB
SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.51 W/kg
Maximum value of SAR (interpolated) = 12.6 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.1 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 18.11 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.44 W/kg
Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

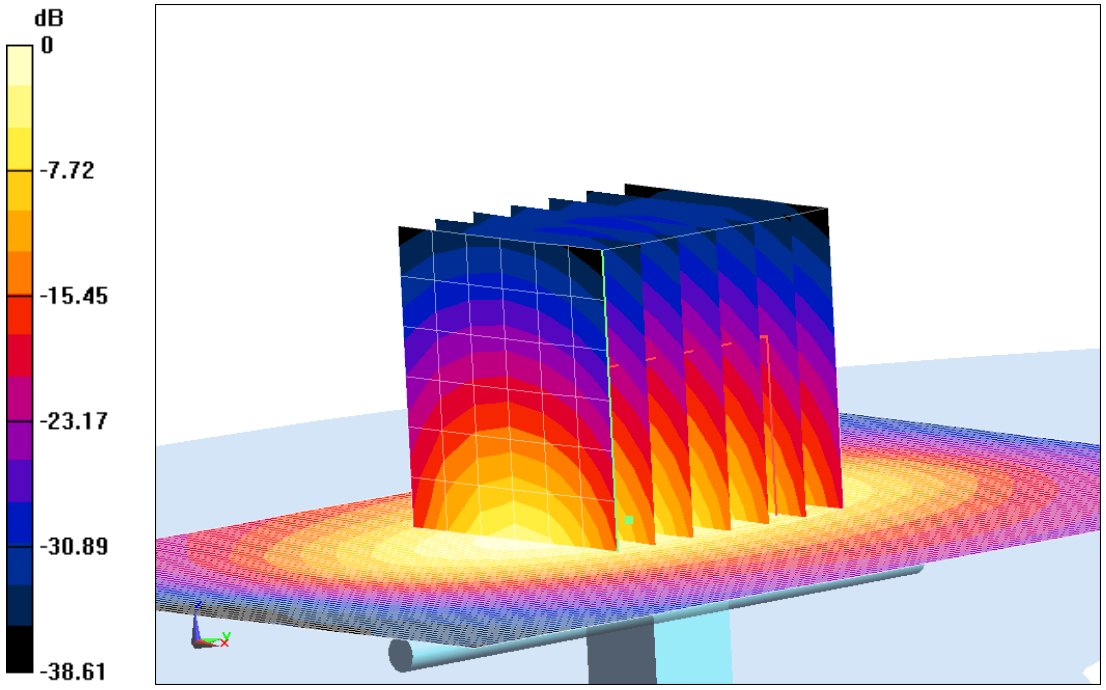
Fig.B.3 validation 1900MHz 250mW

1900MHz

Date: 2019-6-19
Electronics: DAE4 Sn1525
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.547 S/m; ε_r = 52.24; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(7.53, 7.53, 7.53)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 94.4 V/m; Power Drift = 0.04 dB
Fast SAR: SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.56 W/kg
Maximum value of SAR (interpolated) = 12.5 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.4 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 19.08 W/kg
SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.49 W/kg
Maximum value of SAR (measured) = 12.4 W/kg



0 dB = 12.4 W/kg = 10.93 dB W/kg

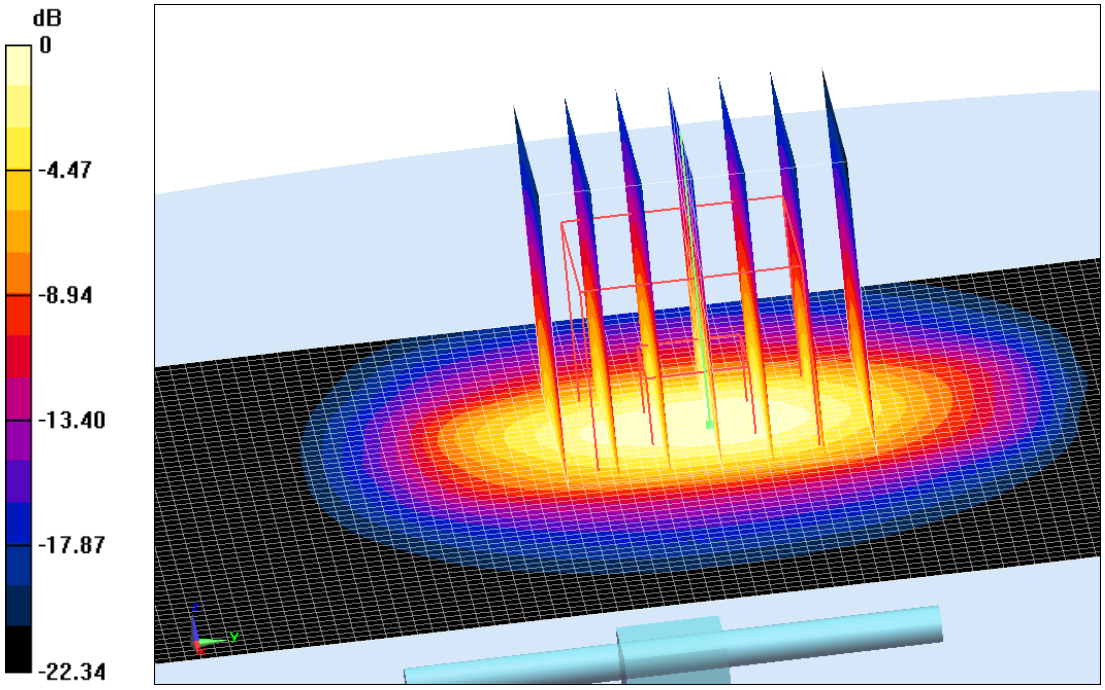
Fig.B.4 validation 1900MHz 250mW

2450MHz

Date: 2019-6-16
Electronics: DAE4 Sn1525
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.798 mho/m; ε_r = 38.89; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7514 ConvF(6.95, 6.95, 6.95)

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 82.01 V/m; Power Drift = -0.01 dB
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.05 W/kg
Maximum value of SAR (interpolated) = 16.1 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.01 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 26.76 W/kg
SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.92 W/kg
Maximum value of SAR (measured) = 15.9 W/kg



0 dB = 15.9 W/kg = 12.01 dBW/kg

Fig.B.5 validation 2450MHz 250mW