SAR TEST REPORT

No. I17Z40060-SEM01

For

TCL Communication Ltd.

GSM one band WCDMA dual band Connected Watch

Model Name: SM05

With

Hardware Version: 04

Software Version: 4K08

FCC ID: 2ACCJAT01

Issued Date: 2017-4-14

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.

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I17Z40060-SEM01	Rev.0	2017-4-5	Initial creation of test report
I17Z40060-SEM01	Rev.1	2017-4-14	1. Update the data in table 8.2/11.3 2. Update the ConvF-values on pg.56 (2450 MHz body). 3. Remove the picture of antenna location. 4. Update the description of test distance on P29

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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:	March 1, 2017
Testing End Date:	March 3, 2017

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 Specific Absorption Rate (SAR) found during testing for TCL Communication Ltd. GSM one band WCDMA dual band Connected Watch SM05 are as follows:

Table 2.1: Highest Reported SAR (10g)

<table>
<tr><th>Exposure Configuration</th><th>Technology Band</th><th>Highest Reported SAR 10g (W/kg)</th><th>Equipment Class</th><th>Limited (W/kg)</th></tr>
<tr><td rowspan="4">Wrist exposure (Separation Distance 0mm)</td><td>PCS 1900</td><td>1.94</td><td rowspan="3">PCE</td><td rowspan="4">4.0</td></tr>
<tr><td>WCDMA 1700</td><td>1.45</td></tr>
<tr><td>WCDMA 1900</td><td>1.52</td></tr>
<tr><td>WiFi</td><td>0.51</td><td>DTS</td></tr>
</table>

Table 2.2: Highest Reported SAR (1g)

<table>
<tr><th>Exposure Configuration</th><th>Technology Band</th><th>Highest Reported SAR 1g (W/kg)</th><th>Equipment Class</th><th>Limited (W/kg)</th></tr>
<tr><td rowspan="4">Next to the mouth (Separation Distance 10mm)</td><td>PCS 1900</td><td>1.20</td><td rowspan="3">PCE</td><td rowspan="4">1.6</td></tr>
<tr><td>WCDMA 1700</td><td>1.16</td></tr>
<tr><td>WCDMA 1900</td><td>1.20</td></tr>
<tr><td>WiFi</td><td>0.28</td><td>DTS</td></tr>
</table>

The SAR values found for the DUT are below the maximum recommended levels of 4.0 W/kg as averaged over any 10g tissue according to the ANSI C95.1-1992.

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**: 1.20W/kg(1g)/1.94W/kg (10g).**

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

	Position	Main antenna	WiFi	Sum
Highest reported SAR value for Body(10mm)	Front(1g)	1.20	0.28	**1.48**
Highest reported SAR value for Body(0mm)	Rear(10g)	1.94	0.51	**2.45**

Table 2.4: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Highest reported SAR value for Body(0mm)	Front(1g)	1.20	0.21	**1.41**
Highest reported SAR value for Body(10mm)	Rear(10g)	1.94	0.17	**2.11**

[1] - Estimated SAR for Bluetooth (see the table 13.3)

According to the above tables, the highest sum of reported SAR values is **1.48 W/kg (1g)/2.45W/kg(10g)**. 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:	5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong,Shanghai,China
Contact:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong,Shanghai,China
Contact:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

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

4.1 About EUT

Description:	GSM one band WCDMA dual band Connected Watch
Model Name:	SM05
Operating mode(s):	GSM 1900, WCDMA1700/1900,WiFi,BT
Tested Tx Frequency:	1850.2 – 1910 MHz (GSM 1900)
	1712.4 – 1752.6 MHz (WCDMA 1700 Band IV)
	1852.4–1907.6 MHz (WCDMA1900 Band II)
	2412 – 2462 MHz (Wi-Fi 2.4G)
GPRS/EGPRS Multislot Class:	33
Device type:	Portable device
Antenna type:	Integrated antenna

4.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	014688000003596	04	4K08
EUT2	014688000002101	04	4K08

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

Note: It is performed to test SAR with the EUT 1 and conducted power with the EUT 2.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	TLp004D1	CAC0490001C1	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.

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

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

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

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
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

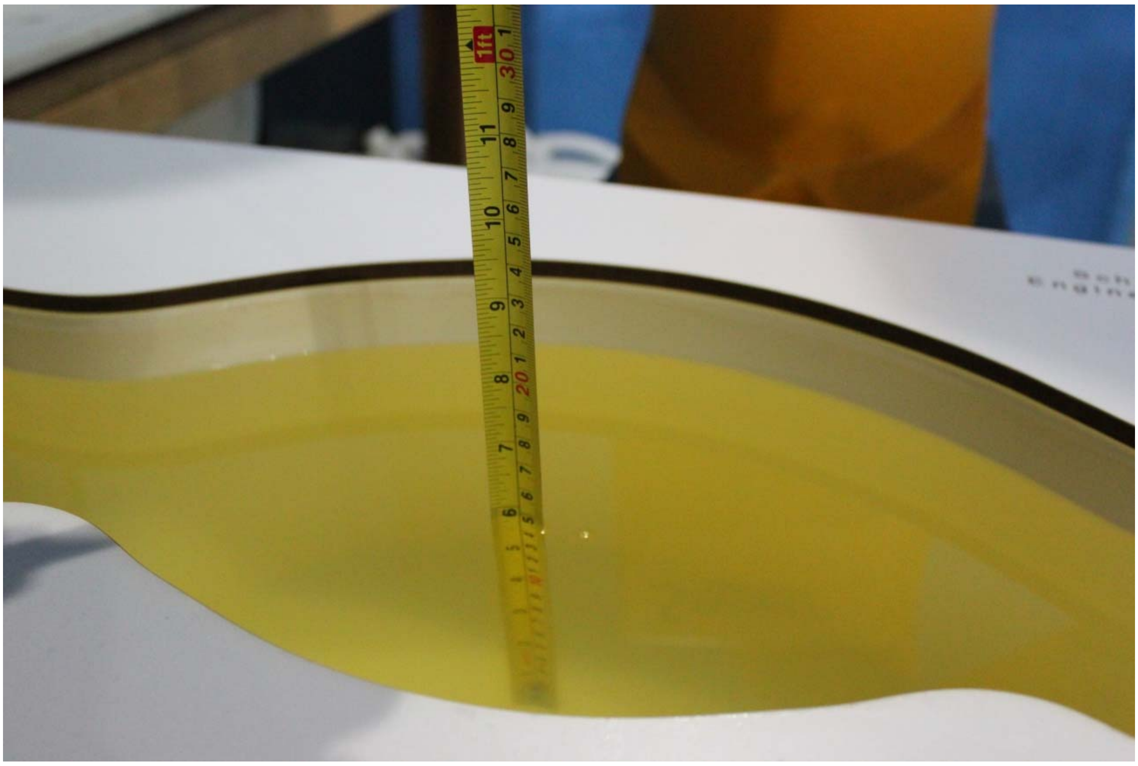
7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

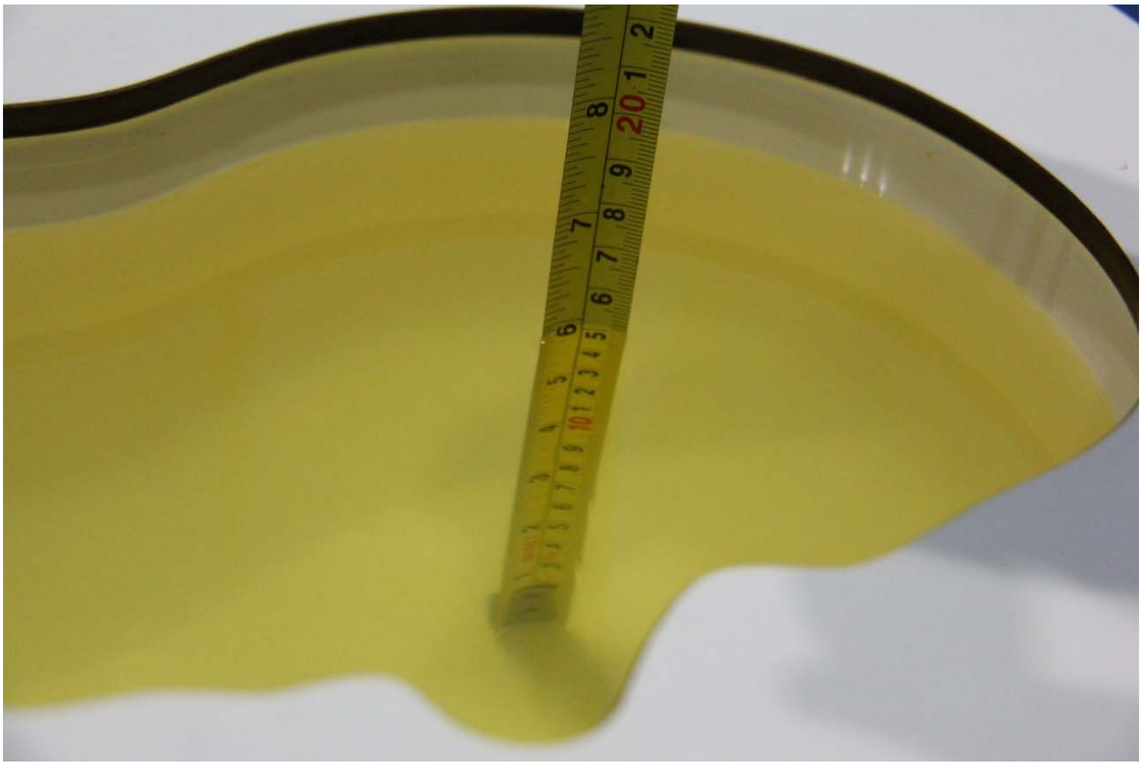
Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2017-3-1	Head	1750 MHz	39.44	-1.60	1.374	0.29
	Body	1750 MHz	54.04	1.20	1.466	-1.61
2017-3-2	Head	1900 MHz	39.33	-1.68	1.382	-1.29
	Body	1900 MHz	53.21	-0.17	1.525	0.33
2017-3-3	Head	2450 MHz	39.22	0.05	1.813	0.72
	Body	2450 MHz	52.62	-0.15	1.95	0.00

Note: The liquid temperature is 22.0℃

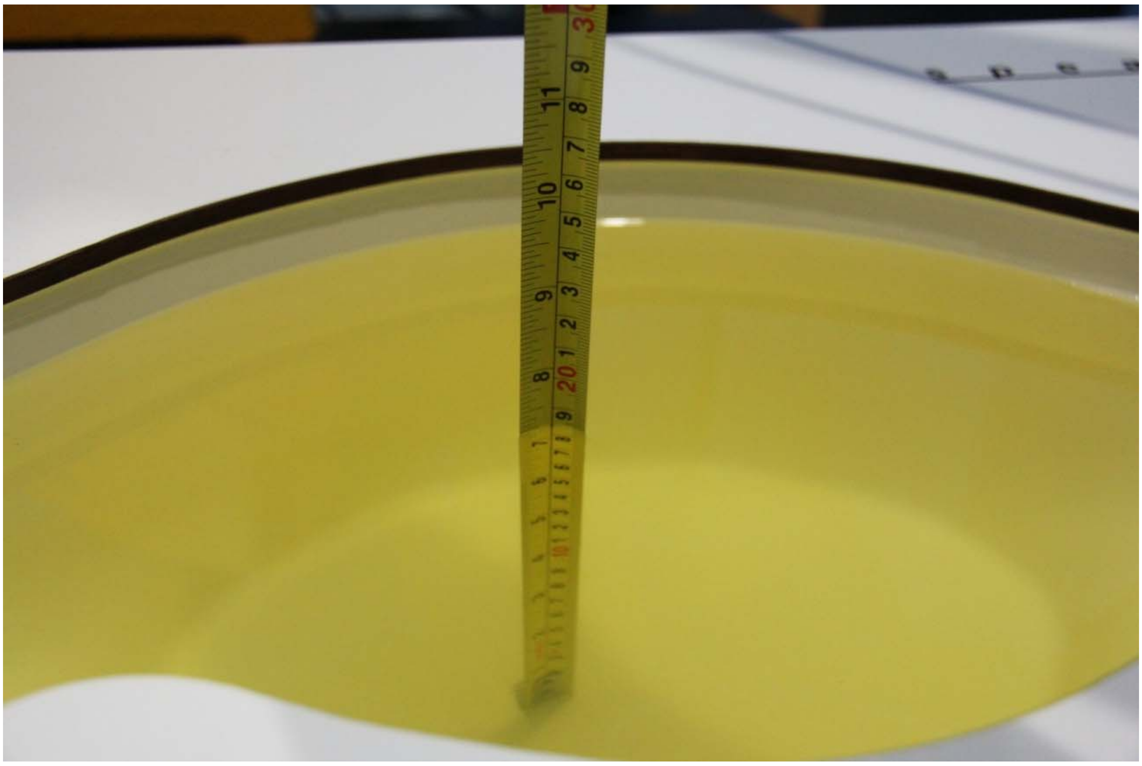
Picture 7-1 Liquid depth in the Head Phantom (1750 MHz)



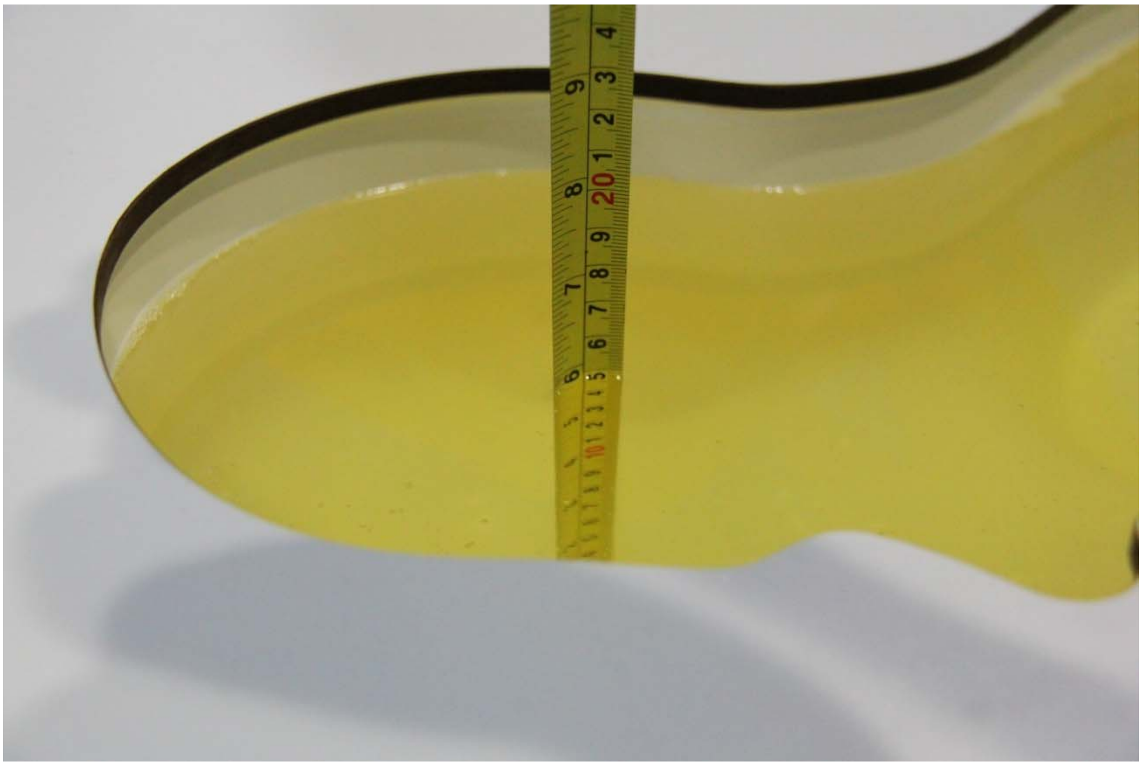
Picture 7-2 Liquid depth in the Flat Phantom (1750MHz)



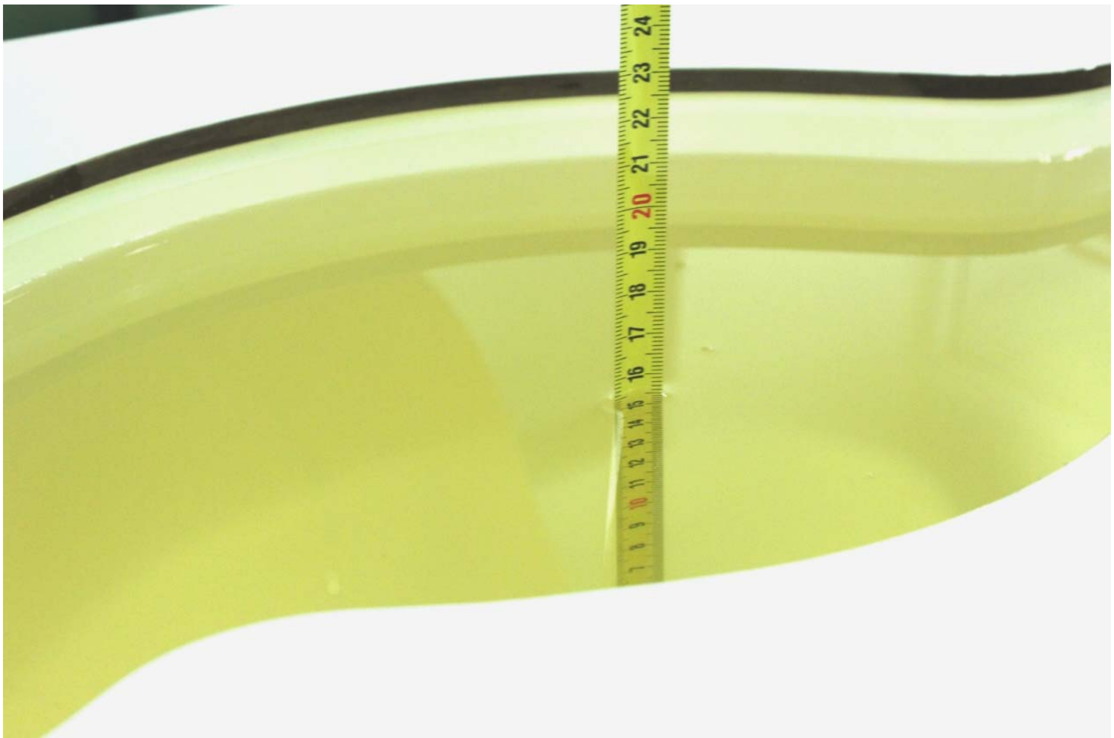
Picture 7-3 Liquid depth in the Head Phantom (1900 MHz)



Picture 7-4 Liquid depth in the Flat Phantom (1900MHz)



Picture 7-5 Liquid depth in the Head Phantom (2450MHz)

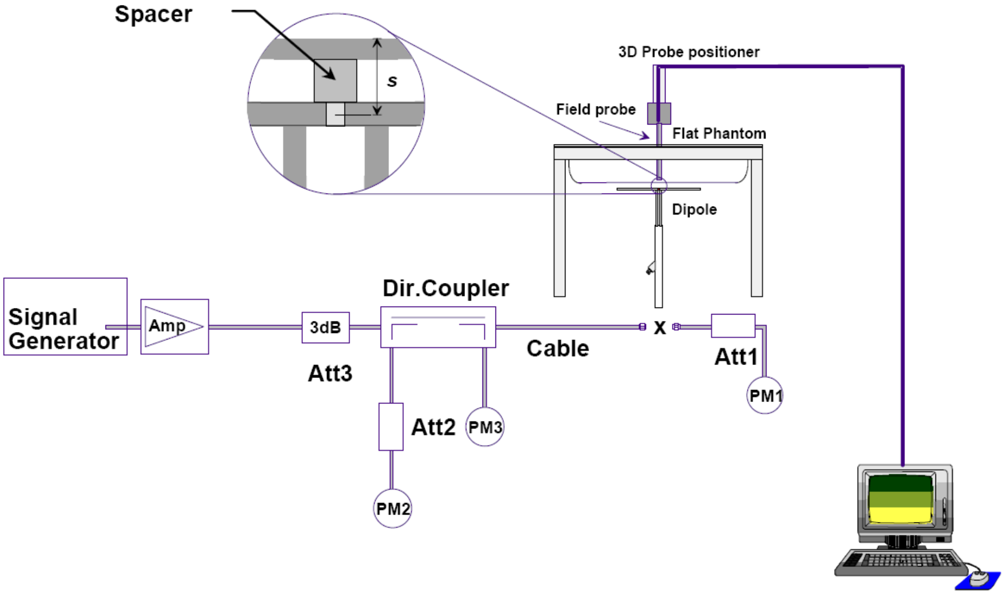


Picture 7-6 Liquid depth in the Flat Phantom (2450MHz)

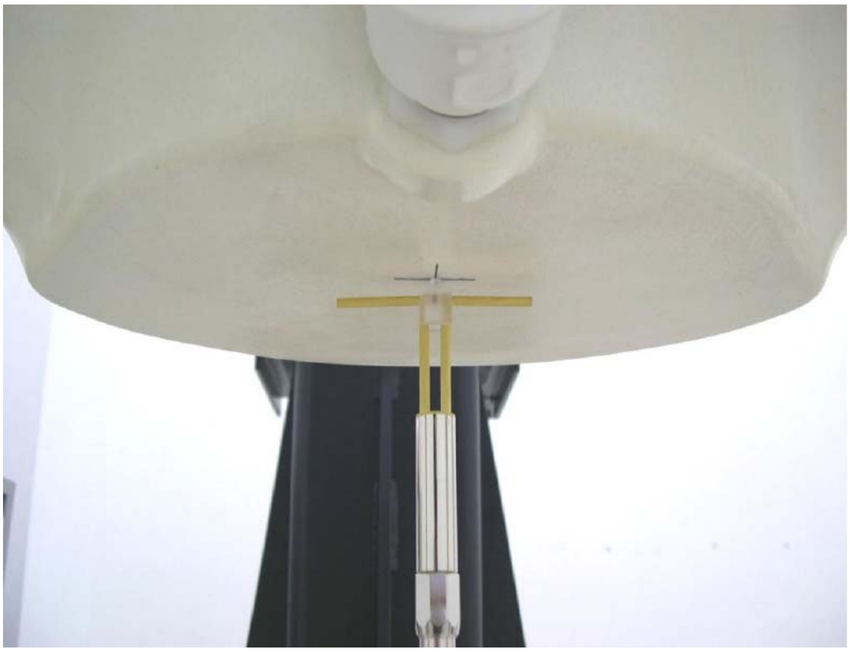
8 System verification

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
2017-3-1	1750 MHz	19.5	36.8	19.44	36.32	-0.31%	-1.30%
2017-3-2	1900 MHz	21.2	40.7	21.56	40.8	1.70%	0.25%
2017-3-3	2450 MHz	24.6	52.8	24.36	52.08	-0.98%	-1.36%

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
2017-3-1	1750 MHz	19.6	37.0	19.44	37	-0.82%	0.00%
2017-3-2	1900 MHz	21.3	40.1	21.48	41	0.85%	2.24%
2017-3-3	2450 MHz	24.1	51.2	24.72	52.76	2.57%	3.05%

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.

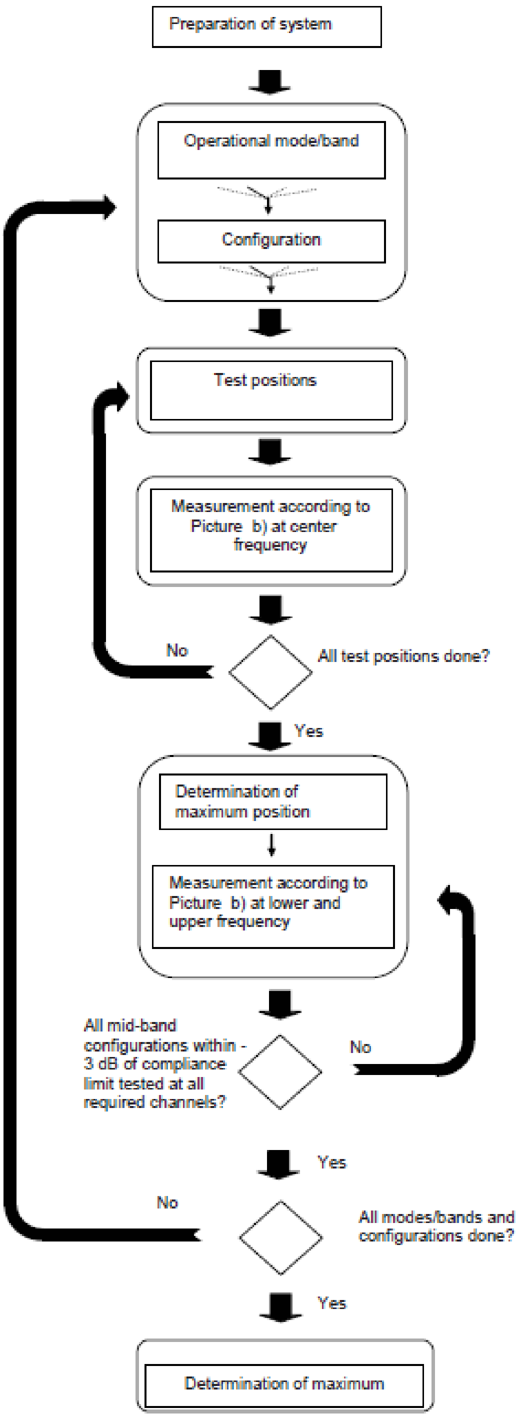
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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

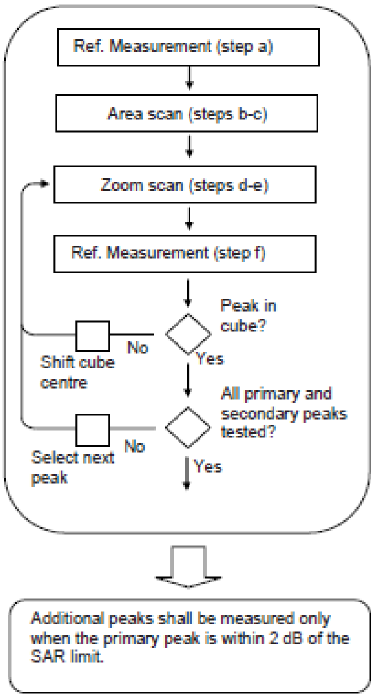
If more than three frequencies need to be tested according to 11.1 (i.e., N_c > 3), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

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 within3 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 a – Tests to be performed



Picture b – General procedure

Picture 9.1Block 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 1528-2003. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

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

9.3 GSM Measurement Procedures for SAR

The following procedures may be considered for each frequency band to determine SAR test reduction for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance. GSM voice mode transmits with 1 time slot. GPRS and EDGE may transmit up to 4 time slots in the 8 time-slot frame according to the multislot class implemented in a device.
SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. GSM voice and GPRS data use GMSK, which is a constant amplitude modulation with minimal peak to average power difference within the time-slot burst. For EDGE, GMSK is used for MCS 1 – MCS 4 and 8-PSK is used for MCS 5 – MCS 9; where 8-PSK has an inherently higher peak-to-average power ratio. The GMSK and 8-PSK EDGE configurations are considered separately for SAR compliance. The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

9.4 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.

9.5 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 12 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-gSAR 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 55wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithm mare 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: The conducted power measurement results for 1900

GSM 1900MHz	Conducted Power(dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	29.43	29.51	29.79
Tune up	30	30	30

Table 11.2: The conducted power measurement results for GSM, GPRS and EGPRS

PCS1900 GPRS (GMSK)	Measured Power (dBm)			Tune up	calculation	Averaged Power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.38	29.47	29.57	30.70	-9.03	20.35	20.44	20.54
2 Txslots	27.61	27.62	27.67	28.20	-6.02	21.59	21.60	21.65
3Txslots	26.65	26.72	26.73	26.80	-4.26	22.39	22.46	22.47
4 Txslots	**25.41**	**25.52**	**25.49**	**25.70**	**-3.01**	**22.40**	**22.51**	**22.48**
PCS1900 EGPRS (GMSK)	Measured Power (dBm)				calculation	Averaged Power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.77	29.83	29.90	30.70	-9.03	20.74	20.80	20.87
2 Txslots	27.67	27.74	27.77	28.20	-6.02	21.65	21.72	21.75
3Txslots	26.71	26.71	26.72	26.80	-4.26	22.45	22.45	22.46
4 Txslots	**25.49**	**25.50**	**25.48**	**25.70**	**-3.01**	**22.48**	**22.49**	**22.47**
PCS1900 EGPRS (8PSK)	Measured Power (dBm)				calculation	Averaged Power (dBm)		
	810	661	512			810	661	512
1 Txslot	26.08	26.07	26.25	26.70	-9.03	17.05	17.04	17.22
2 Txslots	25.89	25.90	26.06	26.50	-6.02	19.87	19.88	20.04
3Txslots	25.73	25.79	25.82	26.00	-4.26	21.47	21.53	21.56
4 Txslots	25.06	25.07	25.17	25.50	-3.01	22.05	22.06	22.16

NOTES:

1) Division Factors

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

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

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

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

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

According to the conducted power as above, the body measurements of PCS1900 are performed with 4Txslots.

11.2 WCDMA Measurement result

Table 11.3: The conducted Power for WCDMA

Item	band	FDDIV result			
	ARFCN	1312 (1712.4MHz)	1412 (1732.4MHz)	1513 (1752.6MHz)	Tune up
WCDMA	\	22.49	22.48	22.45	23.20
HSUPA	1	22.38	22.27	22.59	22.70
	2	21.58	21.58	21.65	21.80
	3	21.39	20.92	21.64	21.70
	4	22.09	21.59	22.03	22.70
	5	22.42	22.54	22.59	23.20
DC-HSDPA	1	21.11	21.23	21.15	22.70
	2	21.14	21.21	21.17	22.70
	3	21.12	21.20	21.15	22.70
	4	21.11	21.22	21.13	22.70
Item	band	FDDII result			
	ARFCN	9262 (1852.4MHz)	9400 (1880MHz)	9538 (1907.6MHz)	Tune up
WCDMA	\	22.51	22.55	22.53	23.20
HSUPA	1	21.59	21.29	21.47	22.70
	2	20.50	20.64	20.24	21.70
	3	20.18	20.28	19.84	21.80
	4	21.09	21.13	21.21	22.70
	5	21.76	21.60	21.75	23.20
DC-HSDPA	1	21.09	21.08	21.02	22.70
	2	21.07	21.07	21.01	22.70
	3	21.06	21.04	21.03	22.70
	4	21.06	21.05	21.02	22.70

11.3 Wi-Fi and BT Measurement result

The output power of BT antenna is as following:

Mode	Conducted Power (dBm)		
	Channel 0 (2402MHz)	Channel 39 (2441MHz)	Channel 78(2480MHz)
GFSK	9.03	9.63	8.07
Tune up	**10**	**10**	**9**
EDR2M-4_DQPSK	9.81	9.91	8.22
Tune up	**10**	**10**	**9**
EDR3M-8DPSK	9.67	9.42	7.76
Tune up	**10**	**10**	**9**

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

802.11b(dBm)								
Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
1(2412MHz)	15.77							
tune up	16.00							
6(2437MHz)	15.21							
tune up	15.50							
11(2462MHz)	17.31	17.11	16.99	16.73				
tune up	17.50	17.50	17.50	17.50				
802.11g(dBm)								
Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1(2412MHz)	9.94							
tune up	10.00							
6(2437MHz)	9.79							
tune up	10.00							
11(2462MHz)	11.99	11.81	11.64	11.30	10.96	10.44	9.96	9.83
tune up	12.00	12.00	12.00	12.00	12.00	12.00	10.00	10.00
802.11n(dBm)-20MHz								
Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1(2412MHz)	8.05							
tune up	9.00							
6(2437MHz)	7.95							
tune up	8.00							
11(2462MHz)	9.99	9.59	9.22	8.88	8.38	7.98	7.83	7.61
tune up	10.00	10.00	10.00	10.00	10.00	8.00	8.00	8.00

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 Standalone SAR Test Exclusion Considerations

Standalone 1-g/10-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/10-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 and 7.5 for 10-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)	Distance	SAR test exclusion threshold(mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.441	0mm	23.96	10	10	yes
		10mm	19.20	10	10	Yes
2.4GHz WLAN	2.45	0mm	23.96	17.5	56.23	No
		10mm	19.17	17.5	56.23	No

12.3 Evaluation of Simultaneous

Table 12.2: The sum of reported SAR values for main antenna and WiFi

	Position	Main antenna	WiFi	Sum
Highest reported SAR value for Body(10mm)	Front(1g)	1.20	0.28	**1.48**
Highest reported SAR value for Body(0mm)	Rear(10g)	1.94	0.51	**2.45**

Table 12.3: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Highest reported SAR value for Body(0mm)	Front(1g)	1.20	0.21	**1.41**
Highest reported SAR value for Body(10mm)	Rear(10g)	1.94	0.17	**2.11**

[1] - Estimated SAR for Bluetooth (see the table 13.3)

Table 12.4: Estimated SAR for Bluetooth

Mode/Band	F (GHz)	Position	Distance (mm)	Upper limit of power *		Estimated (W/kg)
				dBm	mW	
Bluetooth	2.441	Front(1g)	10	10	10.00	0.21
Bluetooth	2.441	Rear(10g)	5	10	10.00	0.17

* - Maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance,mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR..
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

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.

13 SAR Test Result

It is determined by KDB447498 D01 for the distance between the EUT and the phantom bottom. The distance is 10mm/0mm 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-gSAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or >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.

Table 13.1: Duty Cycle

Mode	**Duty Cycle**
GPRS&EGPRS for GSM1900	1:2
WCDMA	1:1

13.1 SAR results for Fast SAR

Table 13.1-1: SAR Values (GSM 1900 MHz Band-Body) 10mm

Ambient Temperature: 23.0℃ Liquid Temperature: 22.5℃											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz										
810	1909.8	GPRS (4)	Front	/	29.43	30	0.412	**0.47**	0.751	**0.86**	-0.03
661	1880	GPRS (4)	Front	/	29.51	30	0.55	**0.62**	1	**1.12**	-0.04
512	1850.2	GPRS (4)	Front	**Fig.1**	29.79	30	0.661	**0.69**	1.14	**1.20**	-0.01

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.1-2: SAR Values (GSM 1900 MHz Band-Body) 0mm

Ambient Temperature: 23.0℃ Liquid Temperature: 22.5℃											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz										
810	1909.8	GPRS (4)	Rear	/	25.41	25.7	1.23	**1.31**	2.47	**2.64**	-0.09
661	1880	GPRS (4)	Rear	/	25.52	25.7	1.55	**1.62**	3.08	**3.21**	-0.13
512	1850.2	GPRS (4)	Rear	**Fig.2**	25.49	25.7	1.85	**1.94**	3.32	**3.48**	-0.05
661	1880	EGPRS(4)	Rear	/	25.48	25.7	1.79	**1.88**	3.27	**3.44**	0.10

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.1-3: SAR Values (WCDMA 1700 MHz Band-Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
1738	1752.6	Front	/	22.45	23.2	0.514	**0.61**	0.924	**1.10**	0.07
1637	1732.4	Front	/	22.48	23.2	0.533	**0.63**	0.960	**1.13**	0.03
1537	1712.4	Front	**Fig.3**	22.49	23.2	0.558	**0.66**	0.985	**1.16**	-0.18

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.1-4: SAR Values (WCDMA 1700 MHz Band-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
1738	1752.6	Rear	/	22.45	23.2	1.11	**1.32**	2.11	**2.51**	0.08
1637	1732.4	Rear	/	22.48	23.2	1.18	**1.39**	2.23	**2.63**	0.12
1537	1712.4	Rear	**Fig.4**	22.49	23.2	1.23	**1.45**	2.25	**2.65**	0.01

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.1-5: SAR Values (WCDMA 1900 MHz Band-Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
9938	1907.6	Front	/	22.53	23.2	0.427	**0.50**	0.771	**0.90**	0.06
9800	1880	Front	/	22.55	23.2	0.564	**0.66**	1.01	**1.17**	0.07
9662	1852.4	Front	**Fig.5**	22.51	23.2	0.576	**0.68**	1.02	**1.20**	0.05

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.1-6: SAR Values (WCDMA 1900 MHz Band-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
9938	1907.6	Rear	/	22.53	23.2	0.998	**1.16**	1.99	**2.32**	0.09
9800	1880	Rear	/	22.55	23.2	1.06	**1.23**	2.09	**2.43**	-0.08
9662	1852.4	Rear	**Fig.6**	22.51	23.2	1.3	**1.52**	2.45	**2.87**	-0.01

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.1-7: SAR Values (WiFi -Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
11	2462	Front	/	17.31	17.5	0.136	**0.14**	0.253	**0.26**	-0.07
6	2437	Front	/	15.21	15.5	0.110	**0.12**	0.208	**0.22**	0.02
1	2412	Front	**Fig.7**	15.77	16	0.139	**0.15**	0.260	**0.27**	-0.14

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.1-8: SAR Values (WiFi-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
11	2462	Rear	**Fig.8**	17.31	17.5	0.475	**0.50**	1.07	**1.12**	0.07
6	2437	Rear	/	15.21	15.5	0.282	**0.30**	0.639	**0.68**	-0.04
1	2412	Rear	/	15.77	16	0.348	**0.37**	0.782	**0.82**	-0.01

Note1: The distance between the EUT and the phantom bottom is 0mm.

13.2 SAR results for Standard procedure

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

Table 13.2-1: SAR Values (GSM 1900 MHz Band-Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz										
512	1850.2	GPRS (4)	Front	**Fig.1**	29.79	30	0.661	**0.69**	1.14	**1.20**	-0.01

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.2-2: SAR Values (GSM 1900 MHz Band-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz										
512	1850.2	GPRS (4)	Rear	**Fig.2**	25.49	25.7	1.85	**1.94**	3.32	**3.48**	-0.05

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.2-3: SAR Values (WCDMA 1700 MHz Band-Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
1537	1712.4	Front	**Fig.3**	22.49	23.2	0.558	**0.66**	0.985	**1.16**	-0.18

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.2-4: SAR Values (WCDMA 1700 MHz Band-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
1537	1712.4	Rear	**Fig.4**	22.49	23.2	1.23	**1.45**	2.25	**2.65**	0.01

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.2-5: SAR Values (WCDMA 1900 MHz Band-Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
9662	1852.4	Front	**Fig.5**	22.51	23.2	0.576	**0.68**	1.02	**1.20**	0.05

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.2-6: SAR Values (WCDMA 1900 MHz Band-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
9662	1852.4	Rear	**Fig.6**	22.51	23.2	1.3	**1.52**	2.45	**2.87**	-0.01

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.2-7: SAR Values (WiFi-Body) 10mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
1	2412	Front	**Fig.7**	15.77	16	0.139	**0.15**	0.260	**0.27**	-0.14

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 13.2-8: SAR Values (WiFi-Body) 0mm

Ambient Temperature: 23.0 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
11	2462	Rear	**Fig.8**	17.31	17.5	0.475	**0.50**	1.07	**1.12**	0.07

Note1: The distance between the EUT and the phantom bottom is 0mm.

Table 13.2-9: SAR Values (WLAN - Body) – 802.11b 1Mbps (Scaled Reported SAR)

Ambient Temperature: 22.2 ℃ Liquid Temperature: 21.7 ℃						
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g) (W/kg)	Scaled reported SAR (1g) (W/kg)
MHz	Ch.					
2412	1	Front	97.73%	100%	**0.27**	**0.28**

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

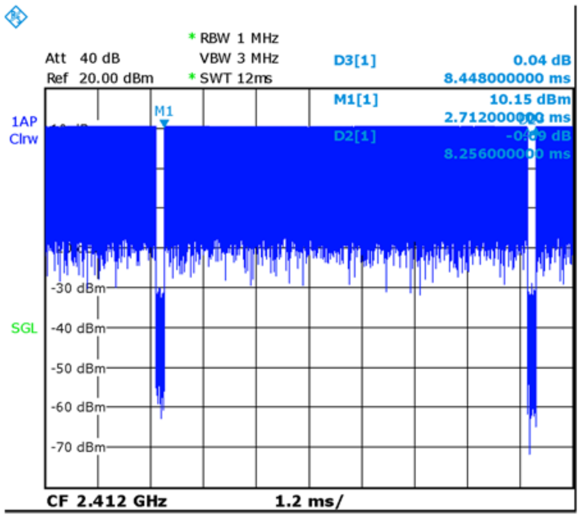
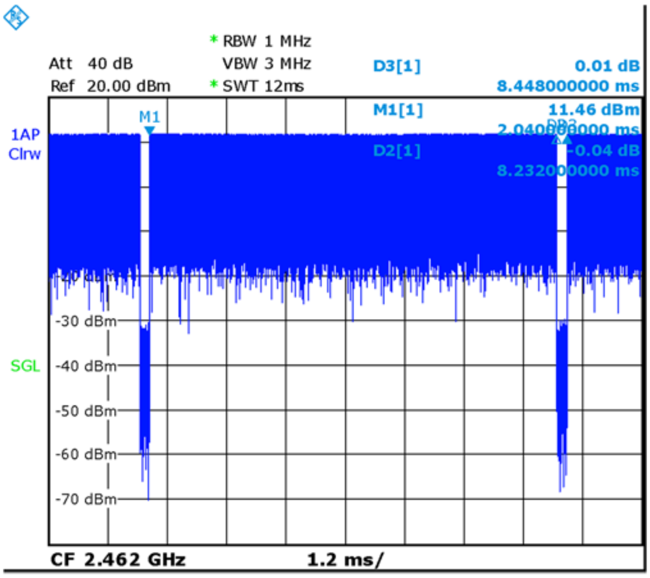


Table 13.2-10: SAR Values (WLAN - Body) – 802.11b 1Mbps (Scaled Reported SAR)

Ambient Temperature: 22.2 ℃ Liquid Temperature: 21.7 ℃						
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (10g) (W/kg)	Scaled reported SAR (10g) (W/kg)
MHz	Ch.					
2462	11	Rear	97.44%	100%	**0.5**	**0.51**

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



14 SAR Measurement Variability

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

The following procedures are applied to determine if repeated measurements are required.
1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Table 14.1: SAR Measurement Variability for Body GSM1900 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
1909.8	810	Front	10	1.14	1.11	1.03	/

Table 14.2: SAR Measurement Variability for Body WCDMA1700 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
1909.8	810	Front	10	0.985	0.977	1.01	/

Table 14.3: SAR Measurement Variability for Body WCDMA1900 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
1909.8	810	Front	10	1.02	1.01	1.01	/

15 Measurement Uncertainty

15.1 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	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	∞
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	

15.2 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	$\sqrt{3}$	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	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	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	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞

Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.8	10.7	636
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.6	21.4	

15.3 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	B	0	R	$\sqrt{3}$	1	1	0	0	∞

	conditions-noise									
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	

15.4 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	

16 MAIN TEST INSTRUMENTS

Table 16.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period

01	Network analyzer	E5071C	MY46110673	January 13,2017	One year
02	Power meter	NRVD	102083	September 22,2016	One year
03	Power sensor	NRV-Z5	100595		
04	Signal Generator	E4438C	MY49071430	January 13,2017	One Year
05	Amplifier	25S1G6	0344445	No Calibration Requested	
06	BTS	E5515C	MY50263375	January16, 2017	One year
07	E-field Probe	SPEAG EX3DV4	3846	January 13,2017	One year
08	DAE	SPEAG DAE4	1331	January 19, 2017	One year
09	Dipole Validation Kit	SPEAG D1900V2	5d101	July 28, 2016	One year
10	Dipole Validation Kit	SPEAG D1750V2	1003	July 21,2016	One year
11	Dipole Validation Kit	SPEAG D2450V2	853	July 25,2016	One year

END OF REPORT BODY

ANNEX A Graph Results

1900 Body Front Low 10mm

Date: 2017-3-2
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.366 mho/m; εr = 39.41; ρ = 1000 kg/m^3
Ambient Temperature: 23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.56 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.41 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.661 W/kg
Maximum value of SAR (measured) = 1.36 W/kg

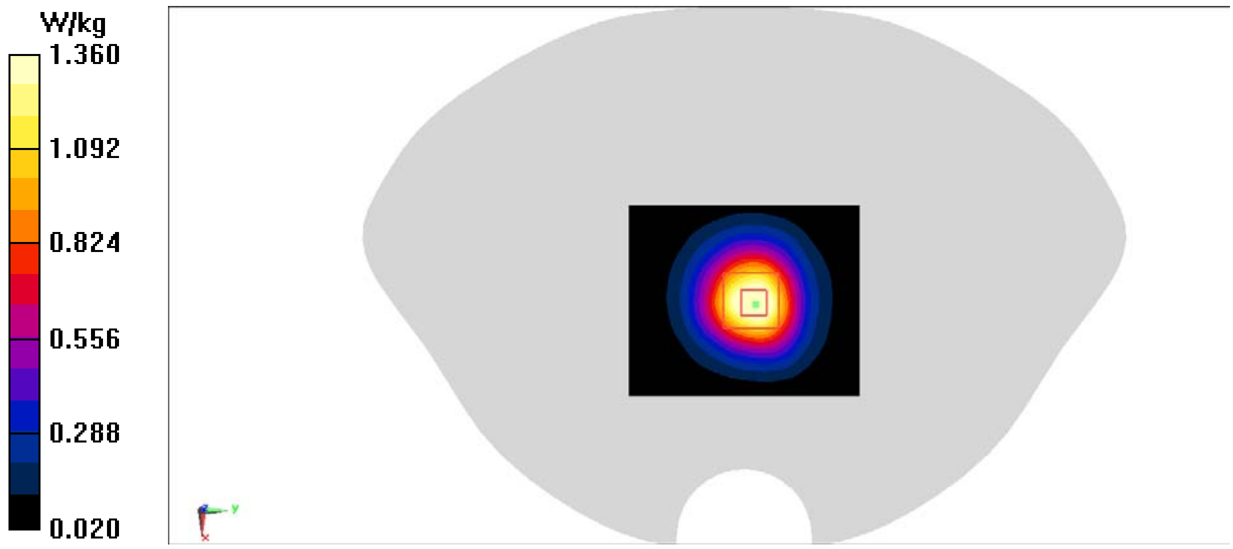


Fig.1 1900 MHz

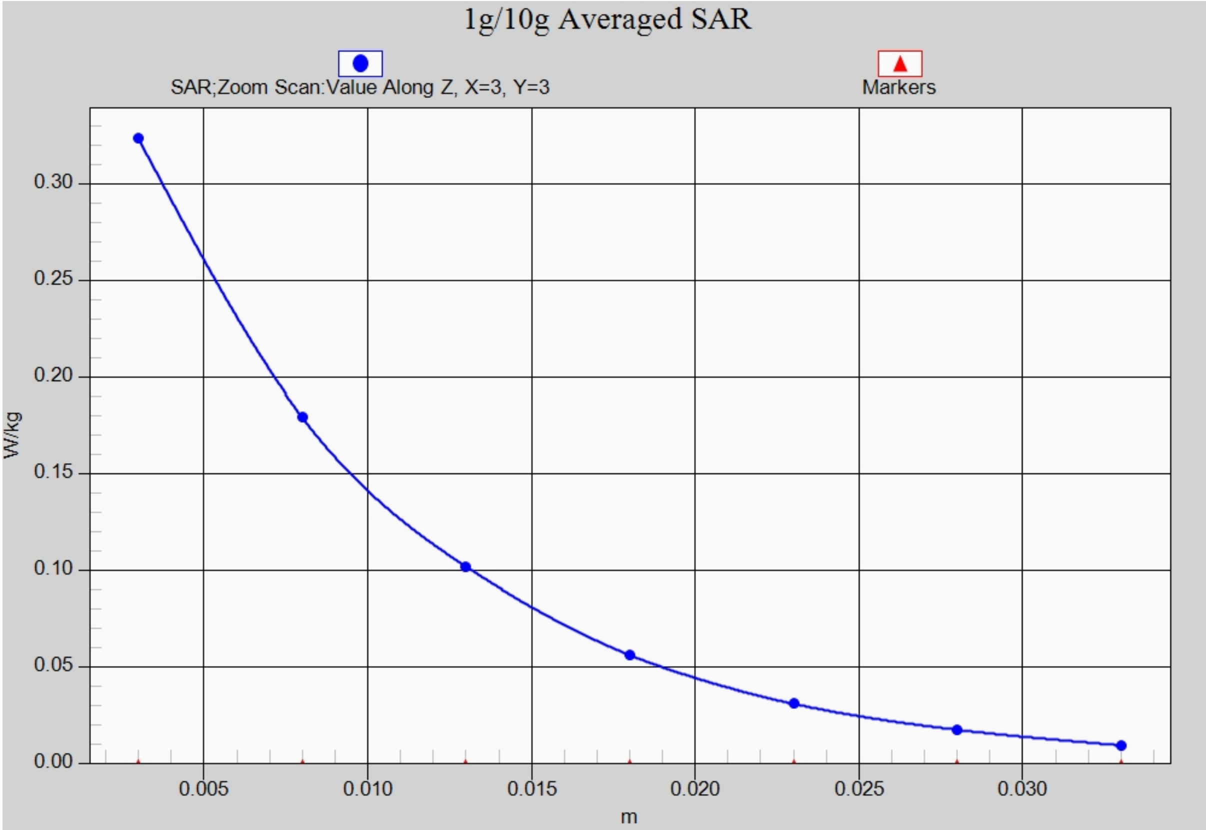


Fig.1-1 Z-Scan at power reference point (1900 MHz)

1900 Body Rear Low 0mm
Date: 2017-3-2
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.501 mho/m; εr = 53.29; ρ = 1000 kg/m^3
Ambient Temperature: 23.0°C Liquid Temperature: 22.5°C
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 - SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (51x51x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 5.25 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 47.11 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 5.39 W/kg
SAR(1 g) = 3.32 W/kg; SAR(10 g) = 1.85 W/kg
Maximum value of SAR (measured) = 3.76 W/kg

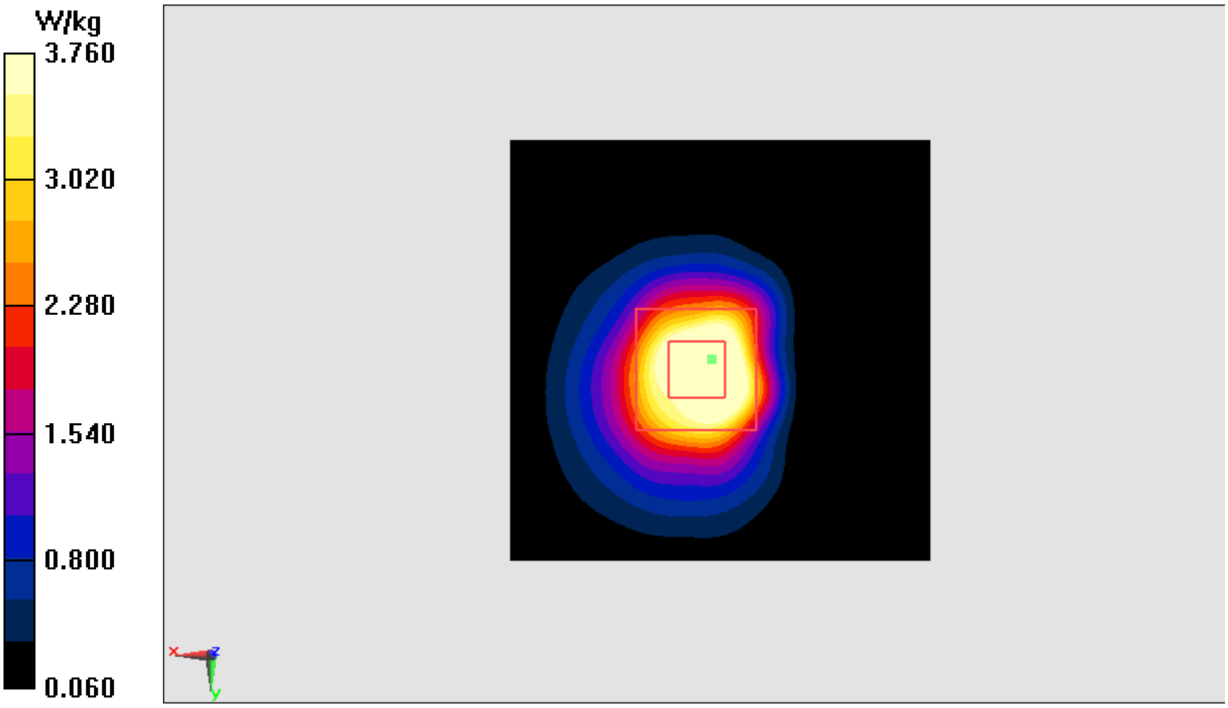


Fig.2 1900 MHz

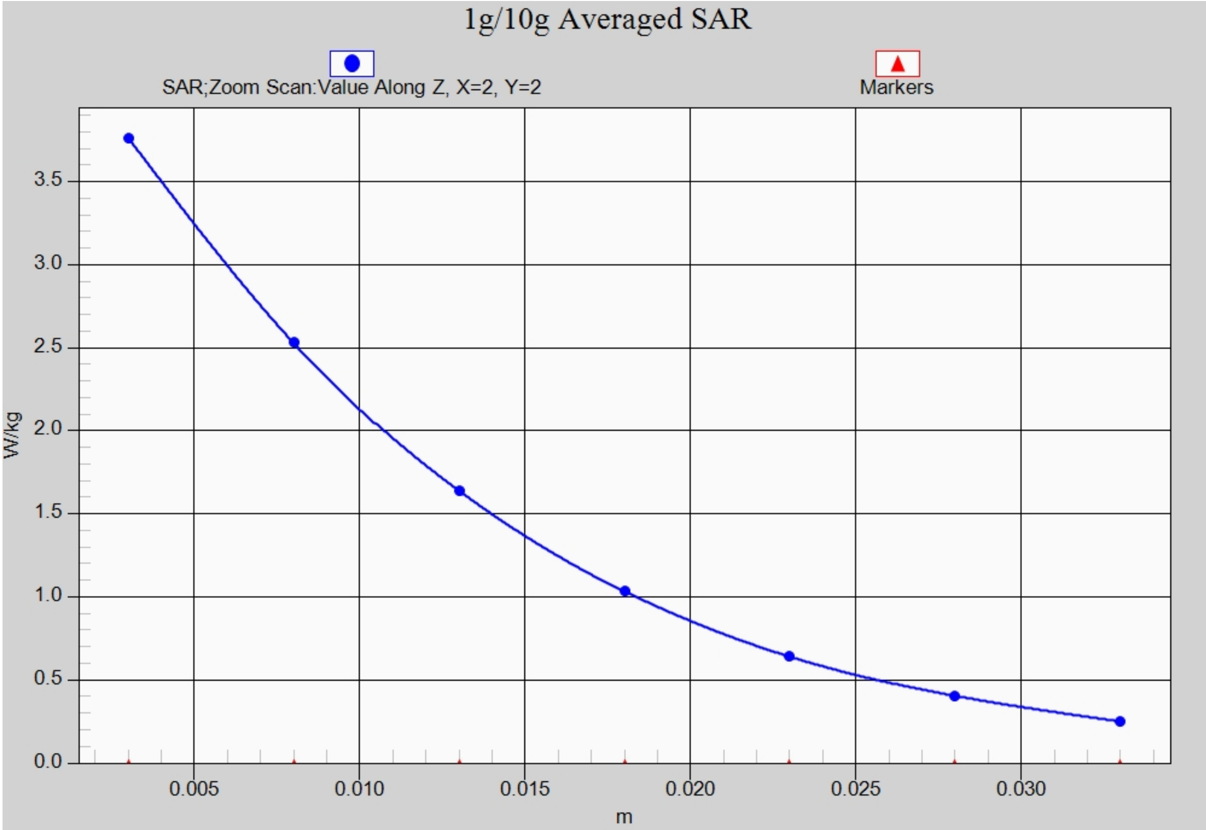


Fig.2-1 Z-Scan at power reference point (1900 MHz)

WCDMA 1700 Body Front Low
Date: 2017-3-1
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used: f = 1712.4 MHz; σ = 1.351 mho/m; εr = 39.52; ρ = 1000 kg/m^3
Ambient Temperature: 23°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1712.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(8.16, 8.16, 8.16)

Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.23 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.99 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.985 W/kg; SAR(10 g) = 0.558 W/kg
Maximum value of SAR (measured) = 1.20 W/kg

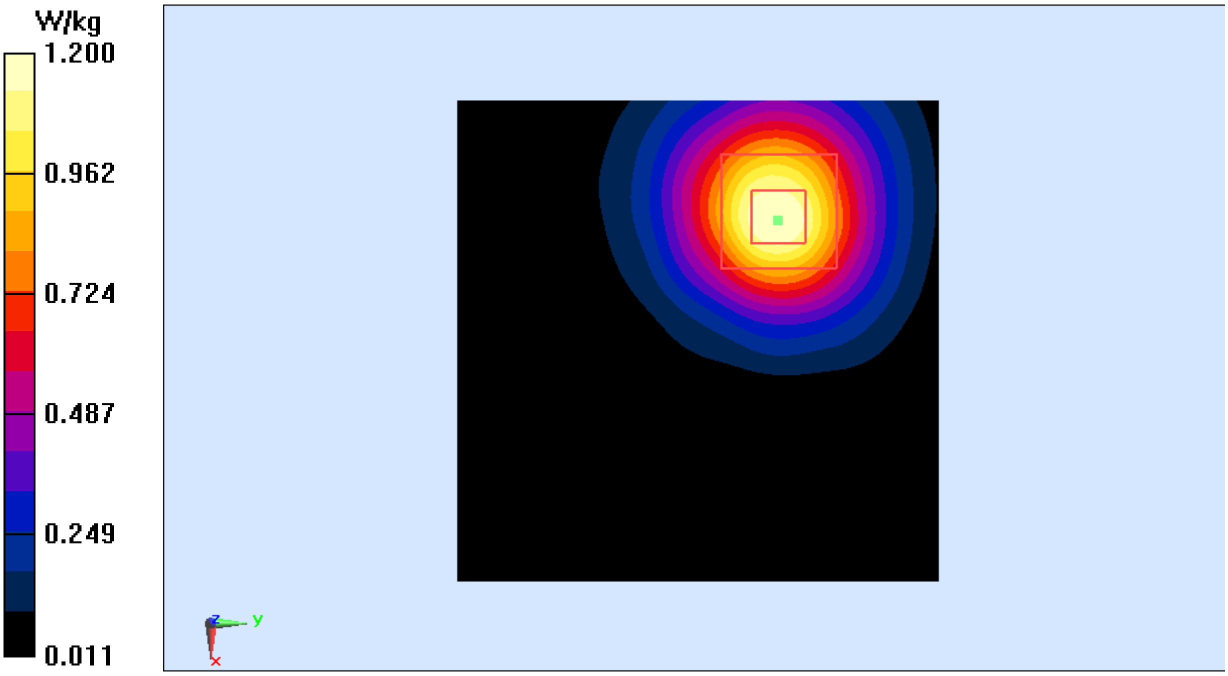


Fig.3 WCDMA1700

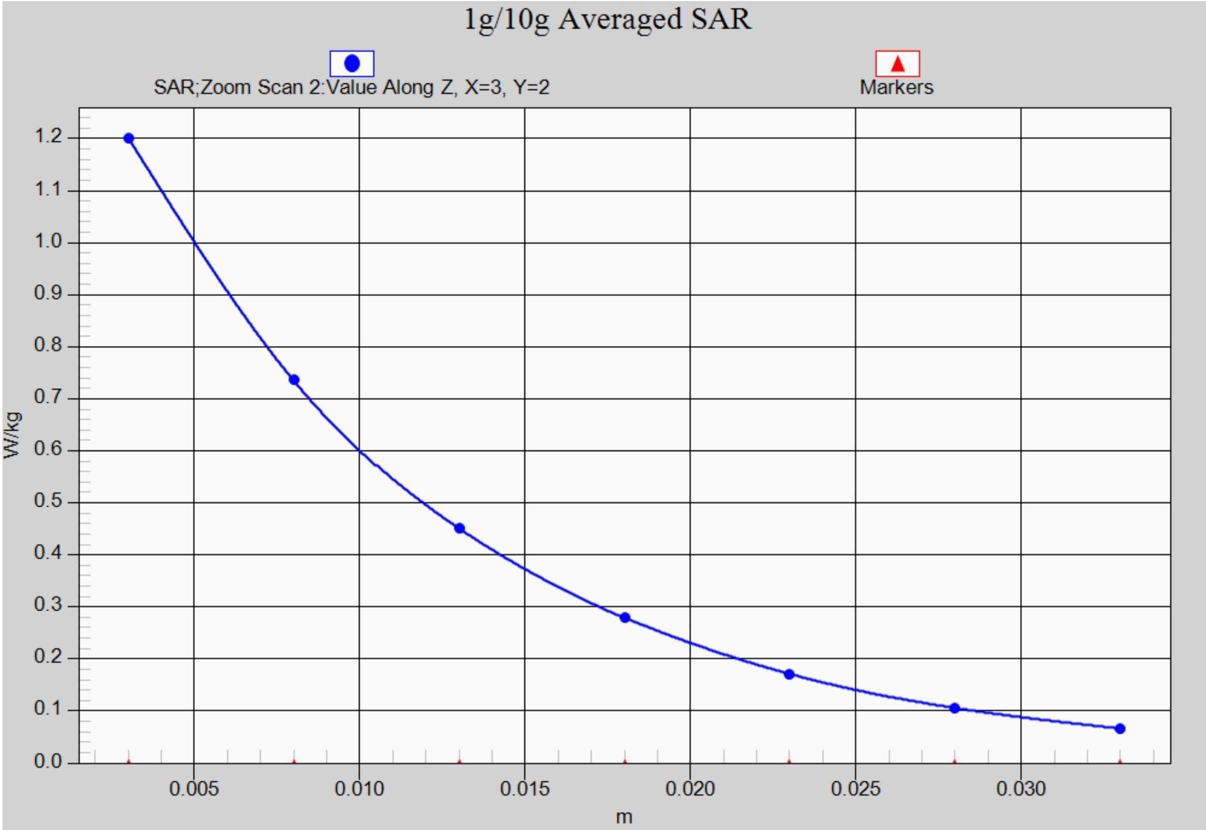


Fig. 3-1 Z-Scan at power reference point (WCDMA1700)

WCDMA 1700 Body Rear Low

Date: 2017-3-1
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f = 1712.4 MHz; σ = 1.452 mho/m; εr = 54.19; ρ = 1000 kg/m^3
Ambient Temperature: 23°C   Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1712.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.90, 7.90, 7.90)

Area Scan (51x51x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.81 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 36.74 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.73 W/kg
SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.23 W/kg
Maximum value of SAR (measured) = 2.58 W/kg

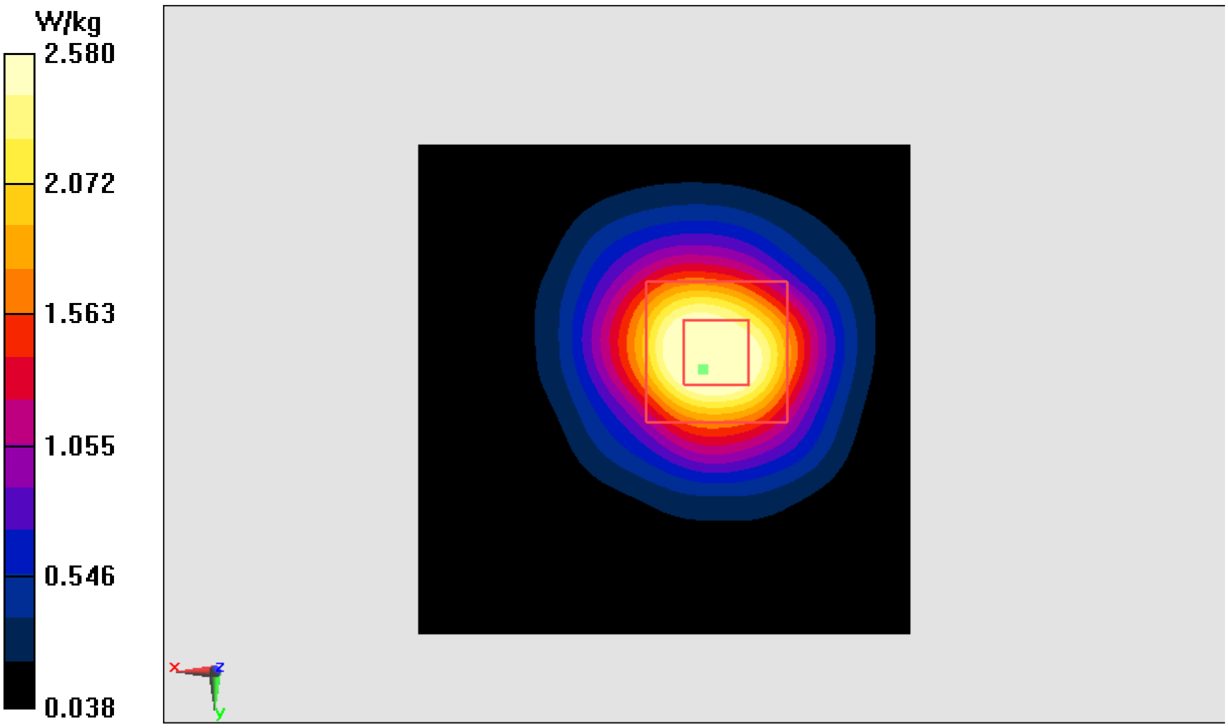


Fig.4 WCDMA1700

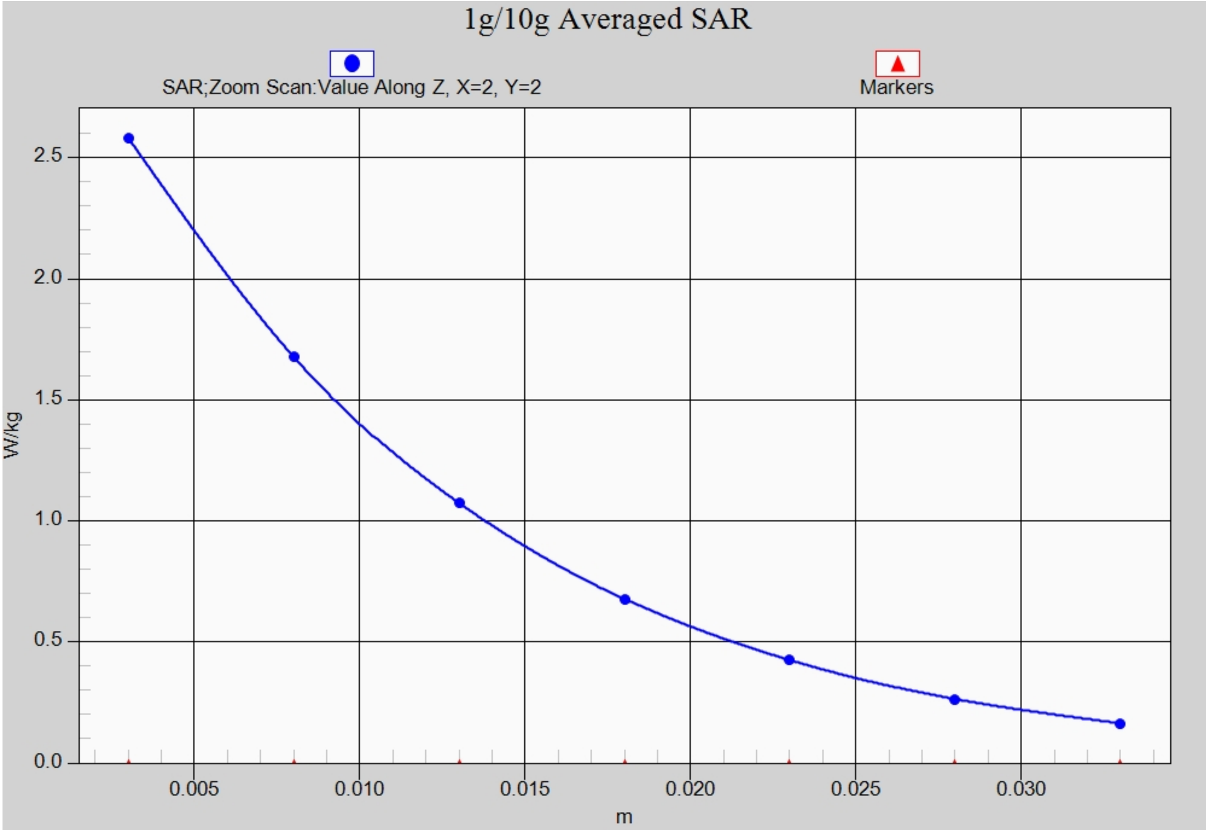


Fig. 4-1 Z-Scan at power reference point (WCDMA1700)

WCDMA 1900 Body Front Low
Date: 2017-3-2
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.368 mho/m; εr = 39.40; ρ = 1000 kg/m^3
Ambient Temperature: 23°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.28 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.20 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.576 W/kg
Maximum value of SAR (measured) = 1.24 W/kg

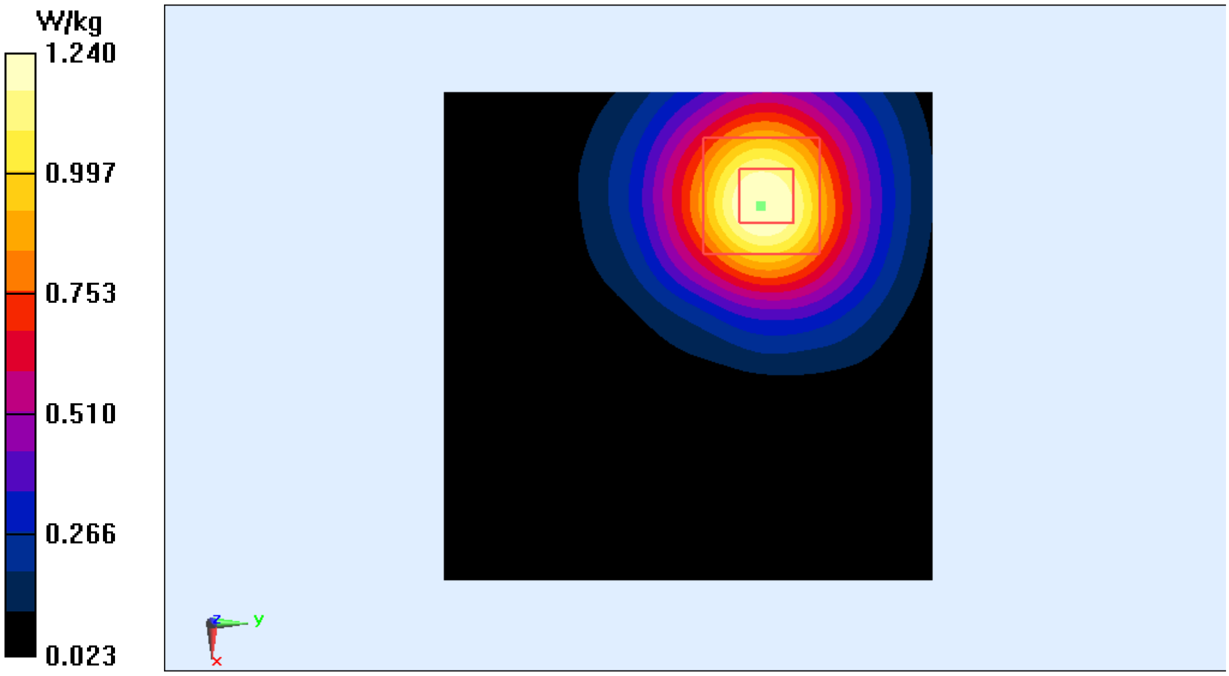


Fig.5 WCDMA1900

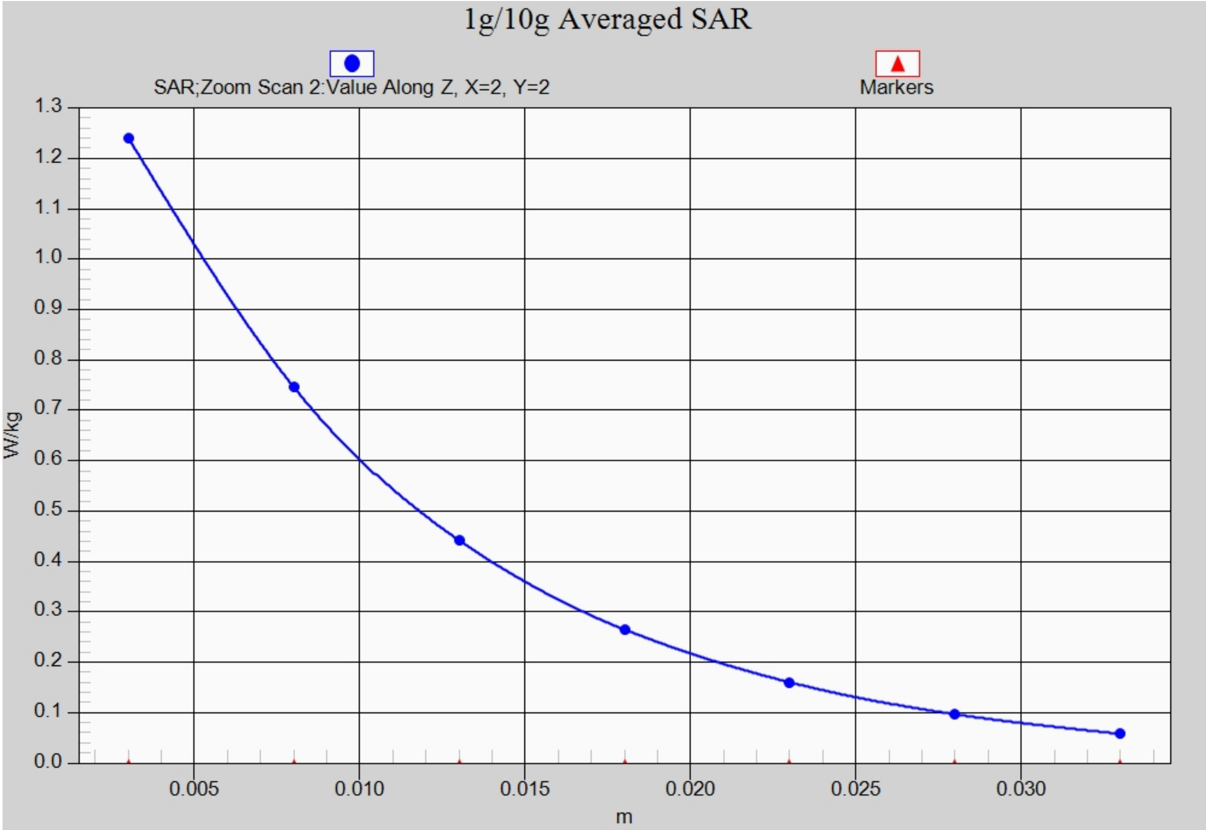


Fig. 5-1 Z-Scan at power reference point (WCDMA1900)

WCDMA 1900 Body Rear Low

Date: 2017-3-2
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.503 mho/m; εr = 53.27; ρ = 1000 kg/m^3
Ambient Temperature: 23°C Liquid Temperature: 22.5°C
Communication System: WCDMA 1900 Frequency: 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (51x51x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 3.09 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 37.72 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 4.56 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.3 W/kg
Maximum value of SAR (measured) = 2.65 W/kg

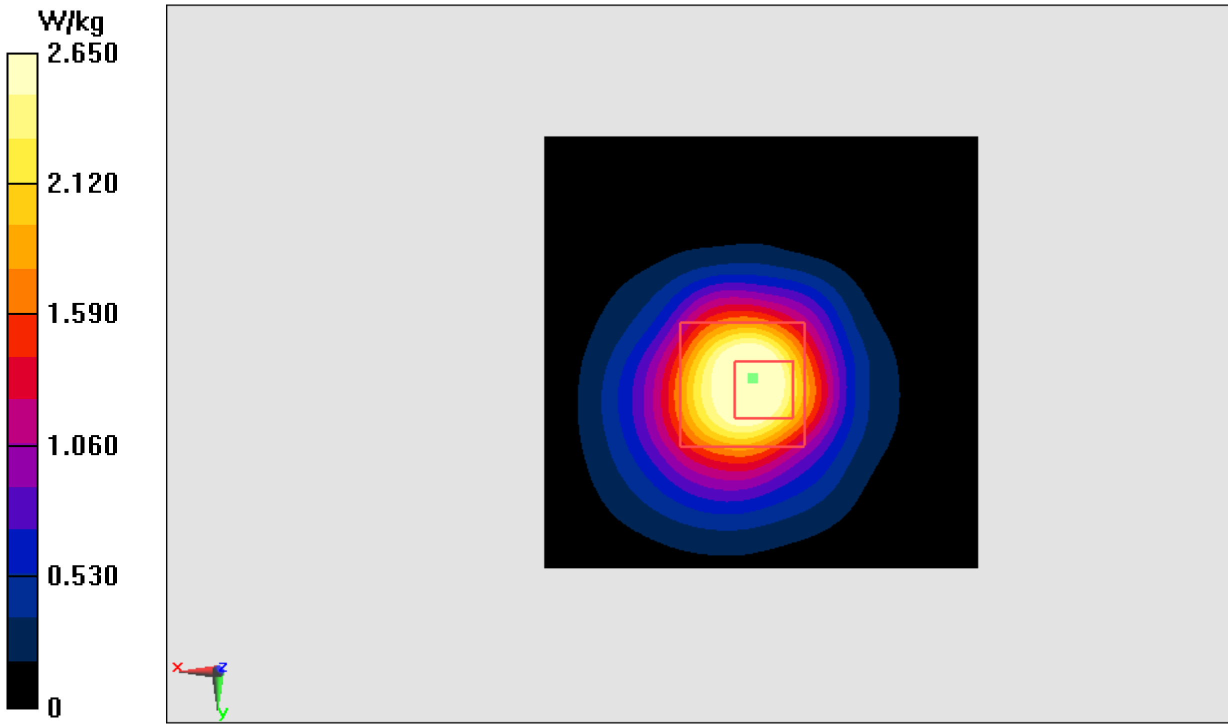


Fig.6 WCDMA1900

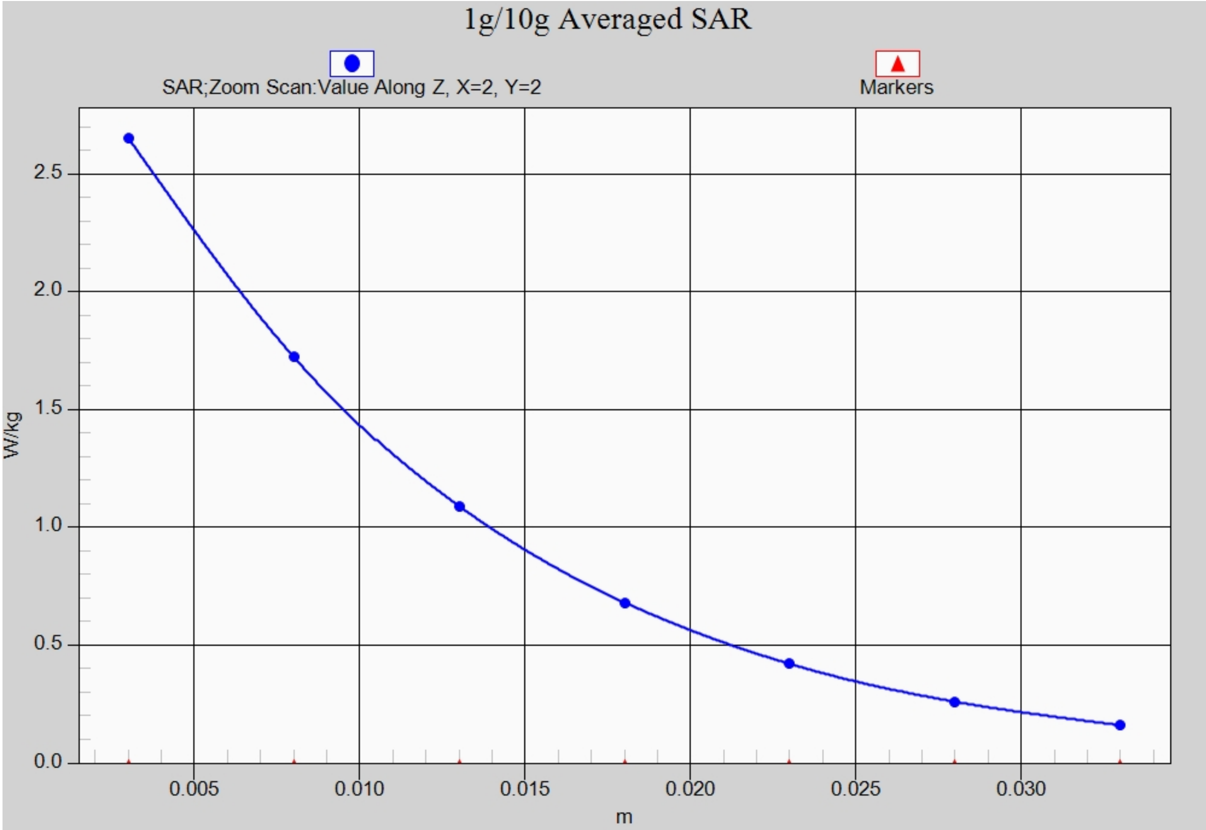


Fig. 6-1 Z-Scan at power reference point (WCDMA1900)

Wifi 802.11b Body Front Channel 1

Date: 2017-3-3

Electronics: DAE4 Sn1331

Medium: Head 2450 MHz

Medium parameters used (interpolated): f = 2412 MHz; σ = 1.791 mho/m; ε_r = 39.29; ρ = 1000 kg/m^3

Ambient Temperature: 23°C Liquid Temperature: 22.5°C

Communication System: WLAN 2450 Frequency: 2412 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3846 ConvF(7.22, 7.22, 7.22)

Area Scan (61x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.343 W/kg

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

Reference Value = 12.24 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.473 W/kg

SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.139 W/kg

Maximum value of SAR (measured) = 0.324 W/kg

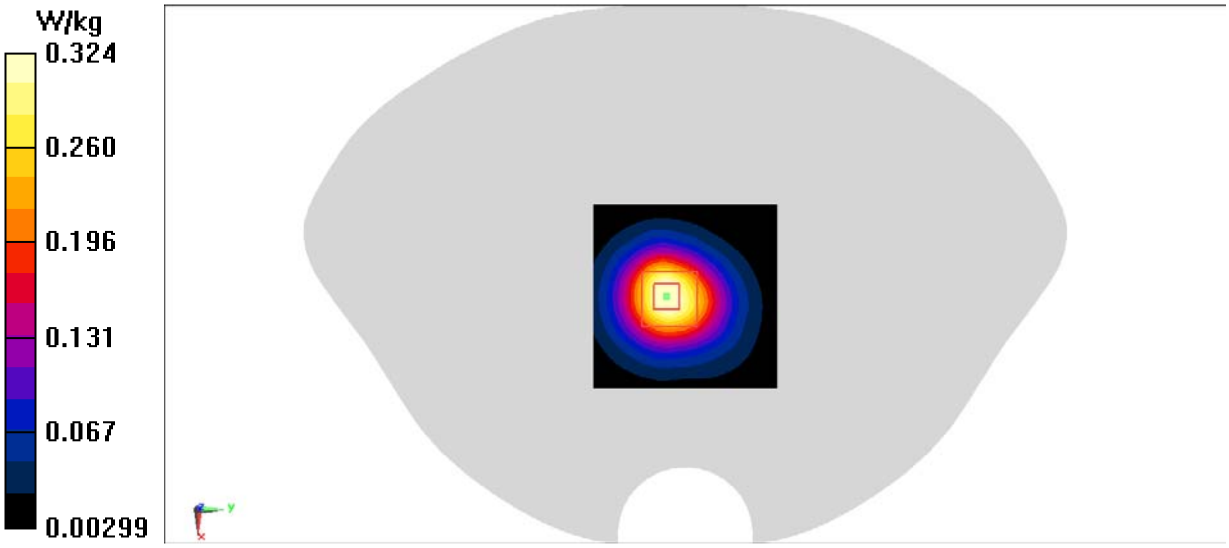


Fig.7 2450 MHz

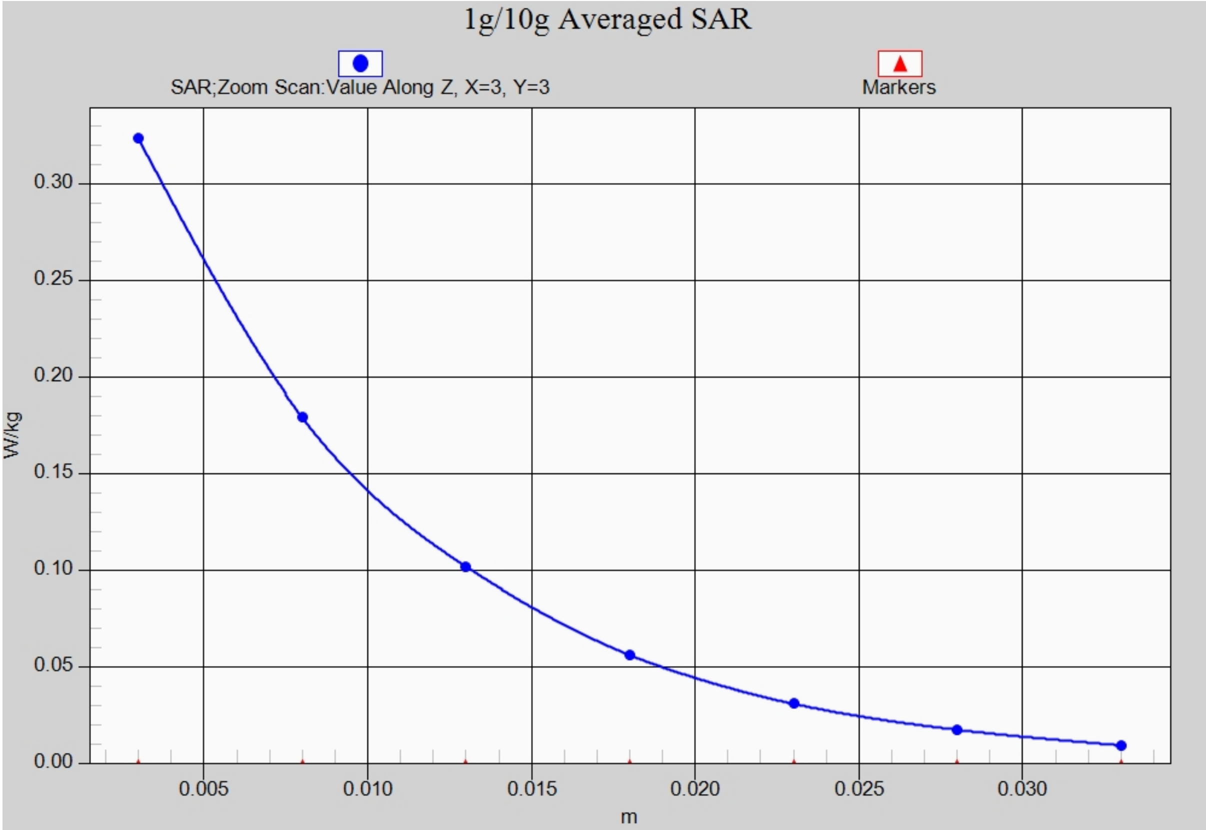


Fig. 7-1 Z-Scan at power reference point (2450 MHz)

Wifi 802.11b Body Rear Channel 11
Date: 2017-3-3
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.953 mho/m; ε_r = 56.57; ρ = 1000 kg/m^3
Ambient Temperature: 23°C Liquid Temperature: 22.5°C
Communication System: WLAN 2450 Frequency: 2462 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.31, 7.31, 7.31)

Area Scan (61x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.51 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.76 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.98 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.475 W/kg
Maximum value of SAR (measured) = 1.24 W/kg

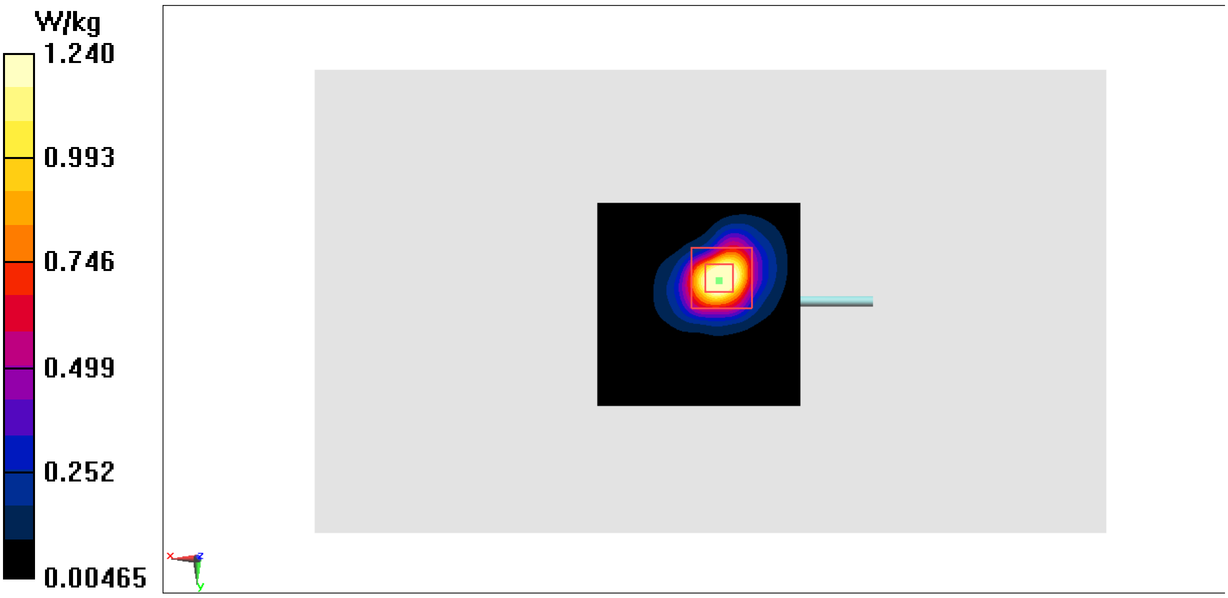


Fig. 8 2450 MHz