SAR TEST REPORT

No. I18Z61172-SEM01

For

TCL Communication Ltd.

LTE/UMTS/GSM mobile phone

Model Name: 5059Z

With

Hardware Version: 04

Software Version: vAPA3

FCC ID: 2ACCJH094

Issued Date: 2018-7-24

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, Xueyuan 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
I18Z61172-SEM01	Rev.0	2018-7-24	Initial creation of test report

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
(if applicable) SAR test lab number	12389A-1

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

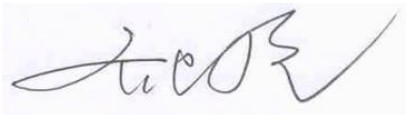
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	July 5, 2018
Testing End Date:	July 9, 2018

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. LTE/UMTS/GSM mobile phone 5059Z 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)	GSM850	0.16	PCE
	PCS1900	0.16	
	WCDMA1900-BII	0.32	
	WCDMA1700-BIV	0.41	
	WCDMA850-BV	0.32	
	LTE1900-FDD2	0.34	
	LTE850-FDD5	0.31	
	LTE700-FDD12	0.33	
	LTE1700-FDD66	0.47	
	LTE700-FDD71	0.19	
	WLAN 2.4 GHz	1.01	DTS
Hotspot (Separation Distance 10mm)	GSM850	0.40	PCE
	PCS1900	0.44	
	WCDMA1900-BII	0.87	
	WCDMA1700-BIV	1.18	
	WCDMA850-BV	0.31	
	LTE1900-FDD2	0.74	
	LTE850-FDD5	0.35	
	LTE700-FDD12	0.40	
	LTE1700-FDD66	0.88	
	LTE700-FDD71	0.31	
	WLAN 2.4 GHz	0.28	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 10 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**:** 1.18 **W/kg (1g).**

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

	Position	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Left hand, Touch cheek	0.47	1.01	**1.48**
Highest reported SAR value for Body	Rear	1.08	0.28	**1.36**

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	0.47	0.21	**0.68**
Maximum reported SAR value for Body	Front	1.18	0.10	**1.28**

[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)**. 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 Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
E-mail:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	/

3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
E-mail:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	/

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

4.1 About EUT

Description:	LTE/UMTS/GSM mobile phone
Model name:	5059Z
Operating mode(s):	GSM 850/900/1800/1900 WCDMA850/1700/1900 LTE B2/4/5/12/66/71, 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)
	824.7 – 848.3 MHz (LTE Band 5)
	699.7 –715.3 MHz (LTE Band 12)
	1710.7 – 1779.3 MHz (LTE Band 66)
	665.5 – 695.5 MHz (LTE Band 71)
	2412 – 2462 MHz (Wi-Fi 2.4G)
GPRS/EGPRS Multislot Class:	12
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Accessories/Body-worn configurations:	Headset
Hotspot mode:	Support
Product dimension	Long 148.2mm ;Wide 69.5mm ; Diagonal 163.69mm

4.2 Internal Identification of EUT used during the test

EUTID	IMEI	HW Version	SW Version
1	015249000200028	04	vAPA3
2	015249000200036	04	vAPA3
3	015249000200010	04	vAPA3
4	015249000200093	04	vAPA3

*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.

4.3 Internal Identification of AE used during the test

AE ID	Description	Model	SN	Manufactory
AE1	Battery	CAC2400038C1	/	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

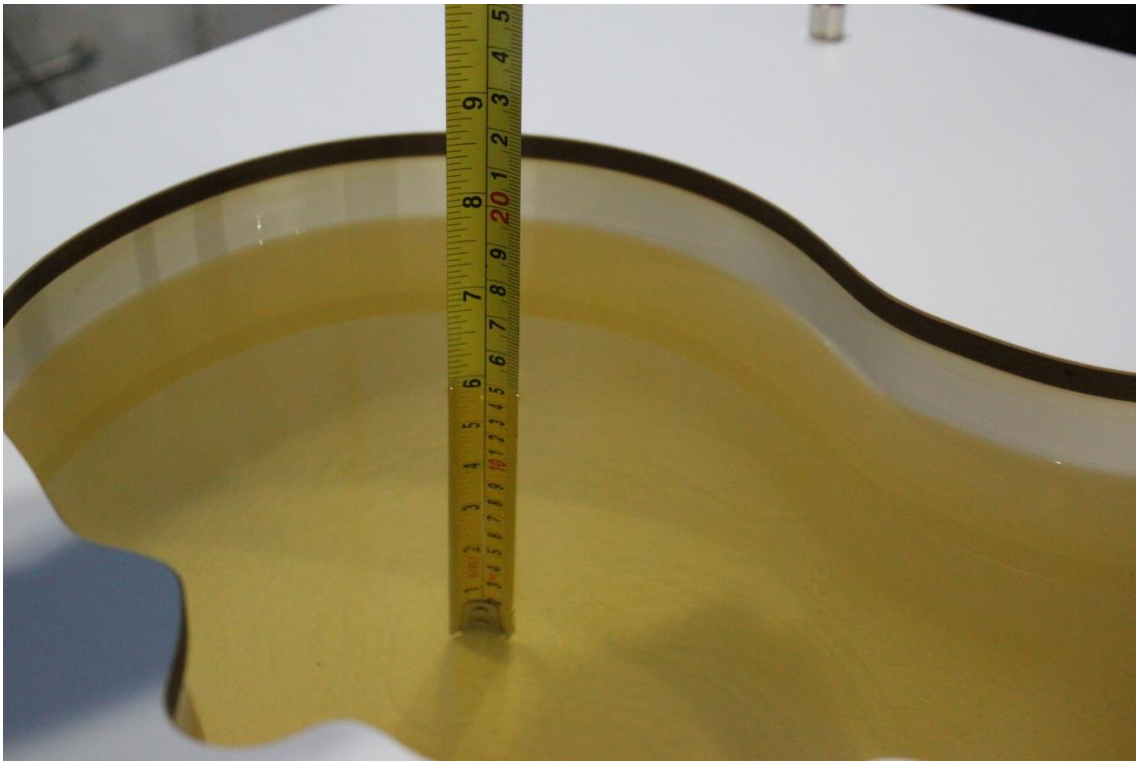
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
750	Body	0.96	0.91～1.01	55.5	52.7～58.3
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
835	Body	0.97	0.92～1.02	55.2	52.4～58.0
1750	Head	1.37	1.30～1.44	40.08	38.1～42.1
1750	Body	1.49	1.42～1.56	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

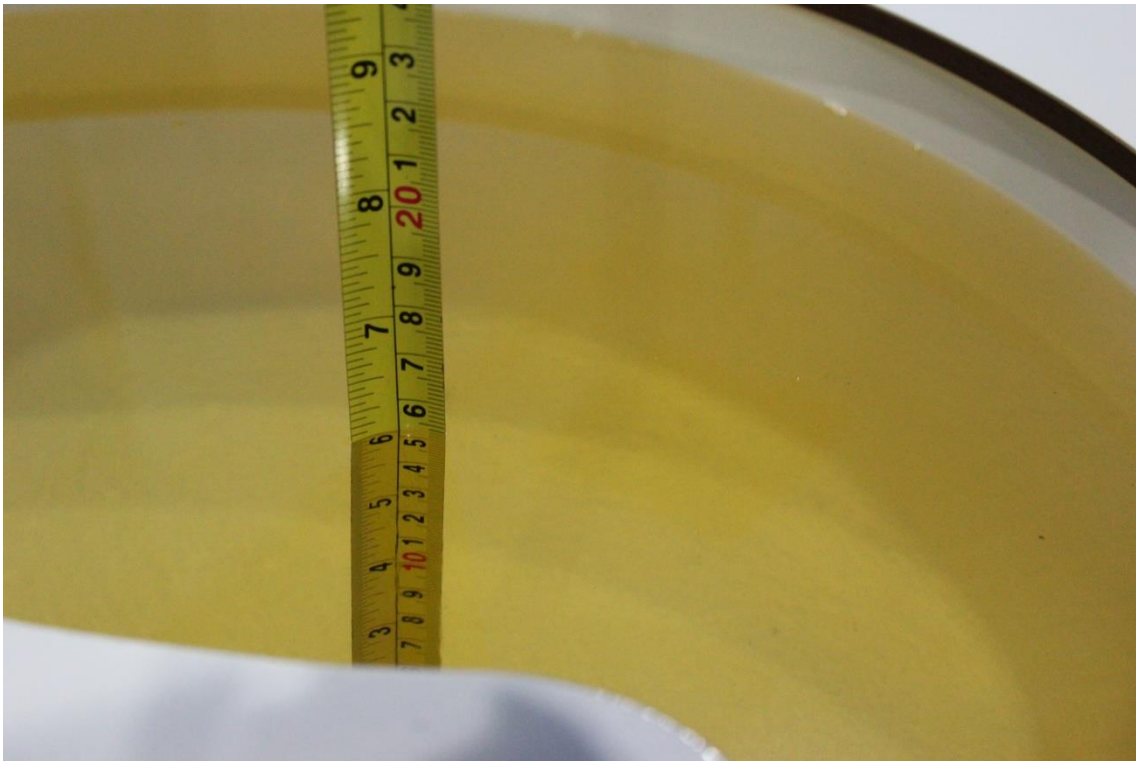
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date yyyy/mm/dd	Frequency	Type	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2018/7/5	750 MHz	Head	41.28	-1.57	0.89	0.00
		Body	56.13	1.14	0.956	-0.42
2018/7/6	835 MHz	Head	40.92	-1.40	0.898	-0.22
		Body	55.65	0.82	0.964	-0.62
2018/7/7	1750 MHz	Head	39.69	-0.97	1.358	-0.88
		Body	52.52	-1.65	1.5	0.67
2018/7/8	1900 MHz	Head	40.74	1.85	1.408	0.57
		Body	52.48	-1.54	1.515	-0.33
2018/7/9	2450 MHz	Head	39.19	-0.03	1.836	2.00
		Body	52.52	-0.34	1.938	-0.62

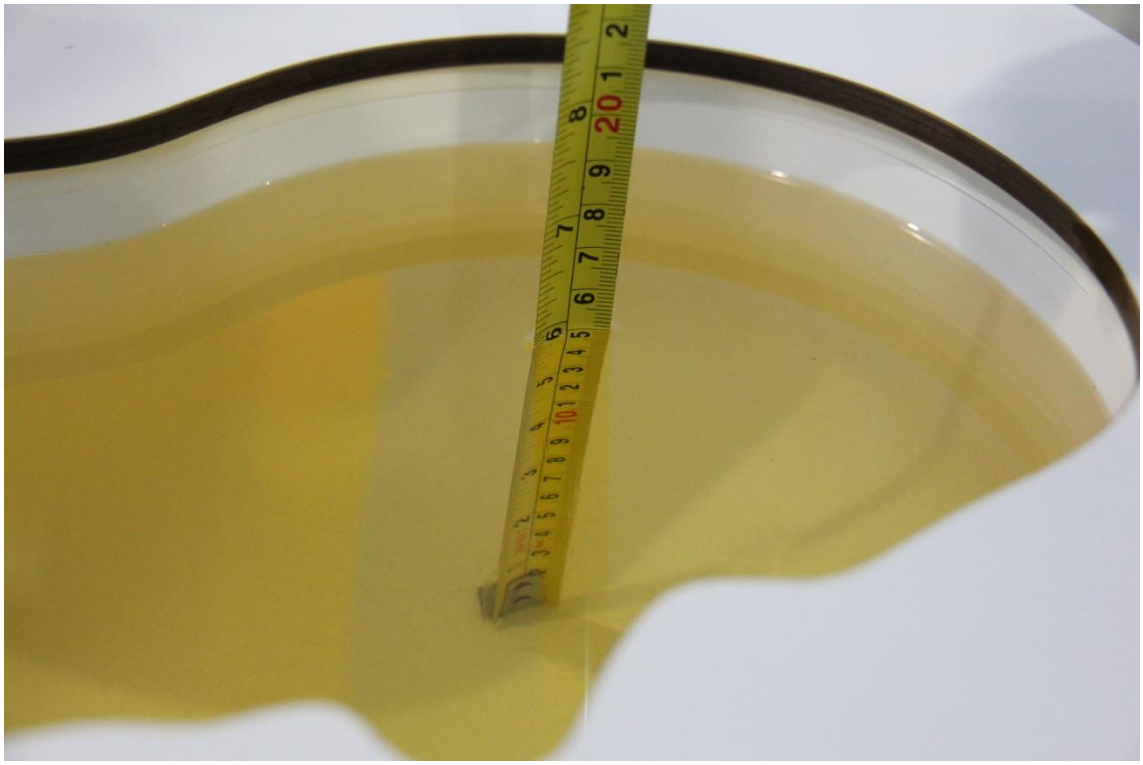
Note: The liquid temperature is 22.0 ºC



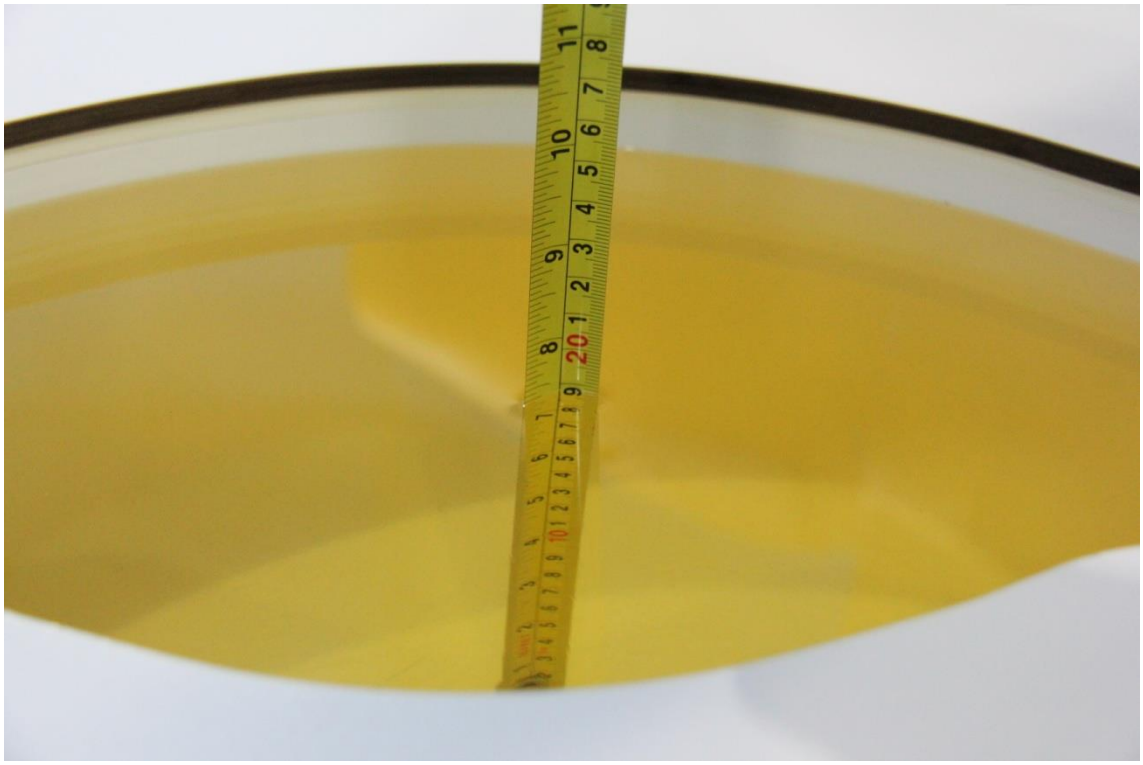
Picture 7-1 Liquid depth in the Head Phantom (750 MHz)



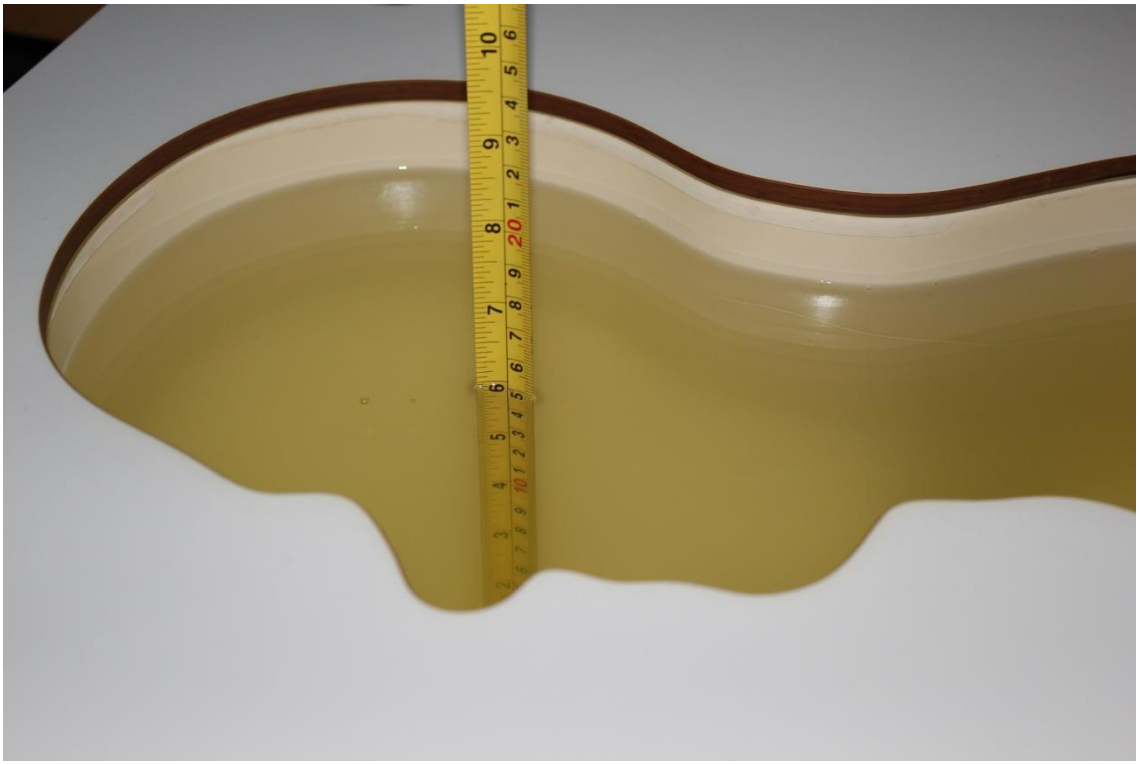
Picture 7-2 Liquid depth in the Flat Phantom (750 MHz)



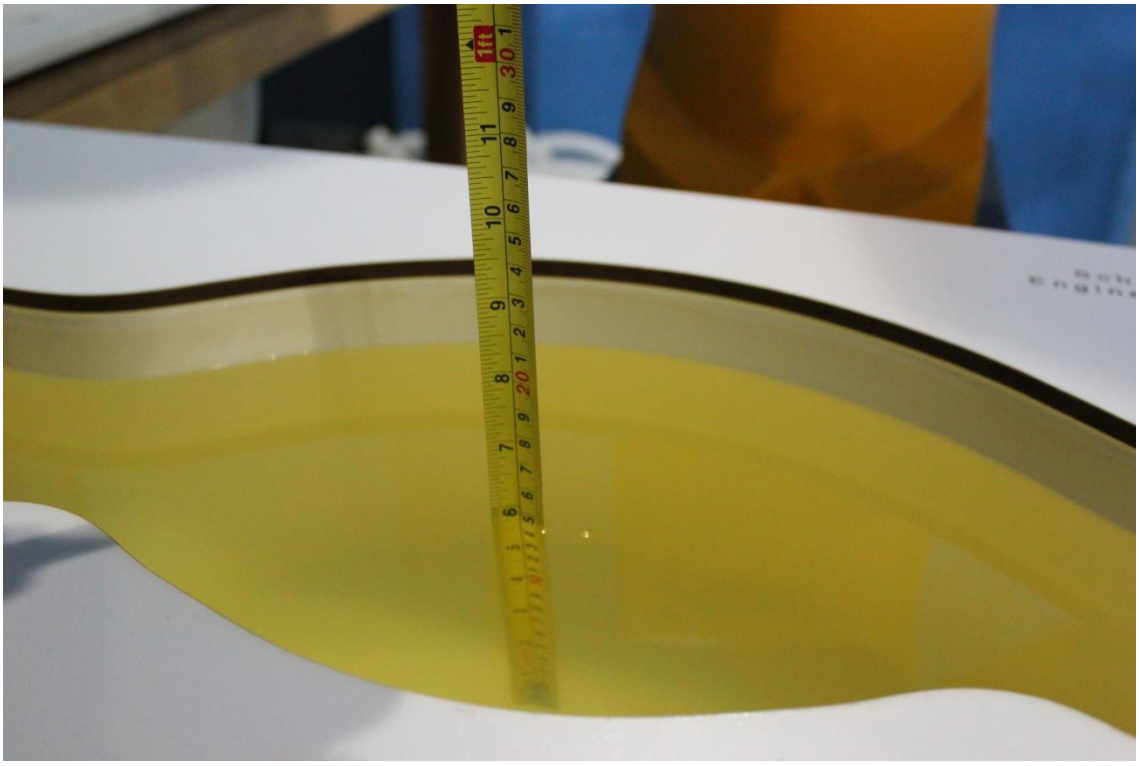
Picture 7-3 Liquid depth in the Head Phantom (835MHz)



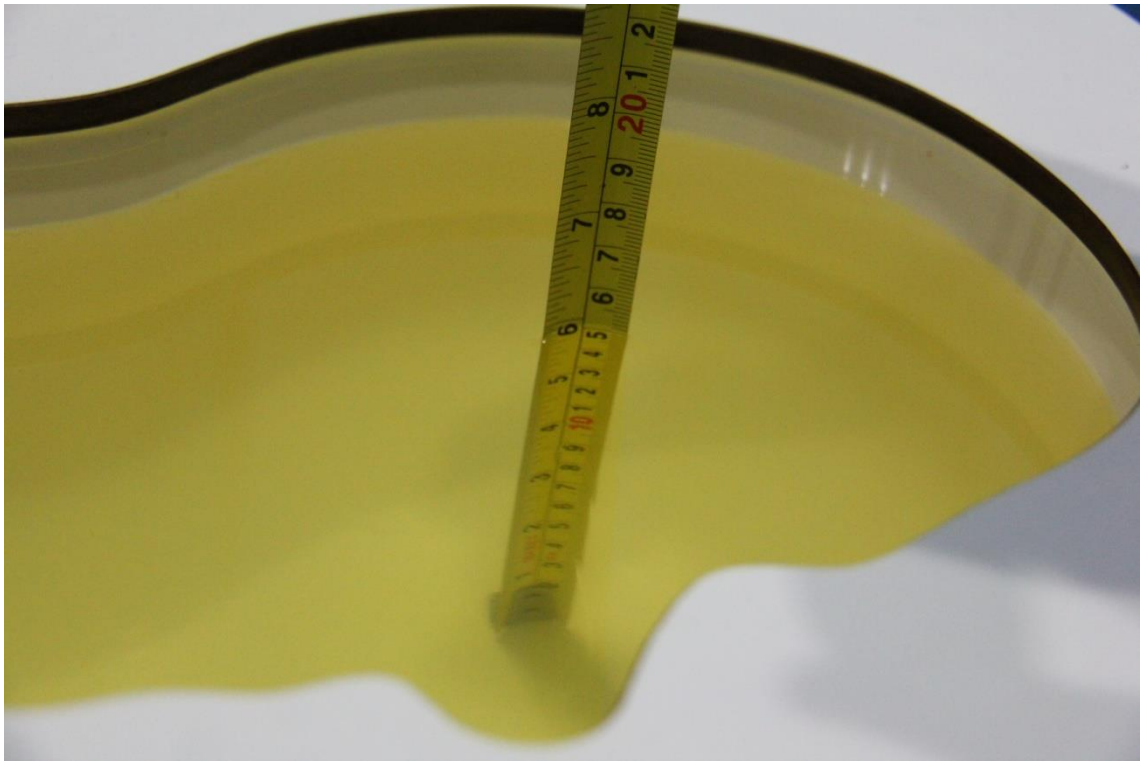
Picture 7-4 Liquid depth in the Flat Phantom (835MHz)



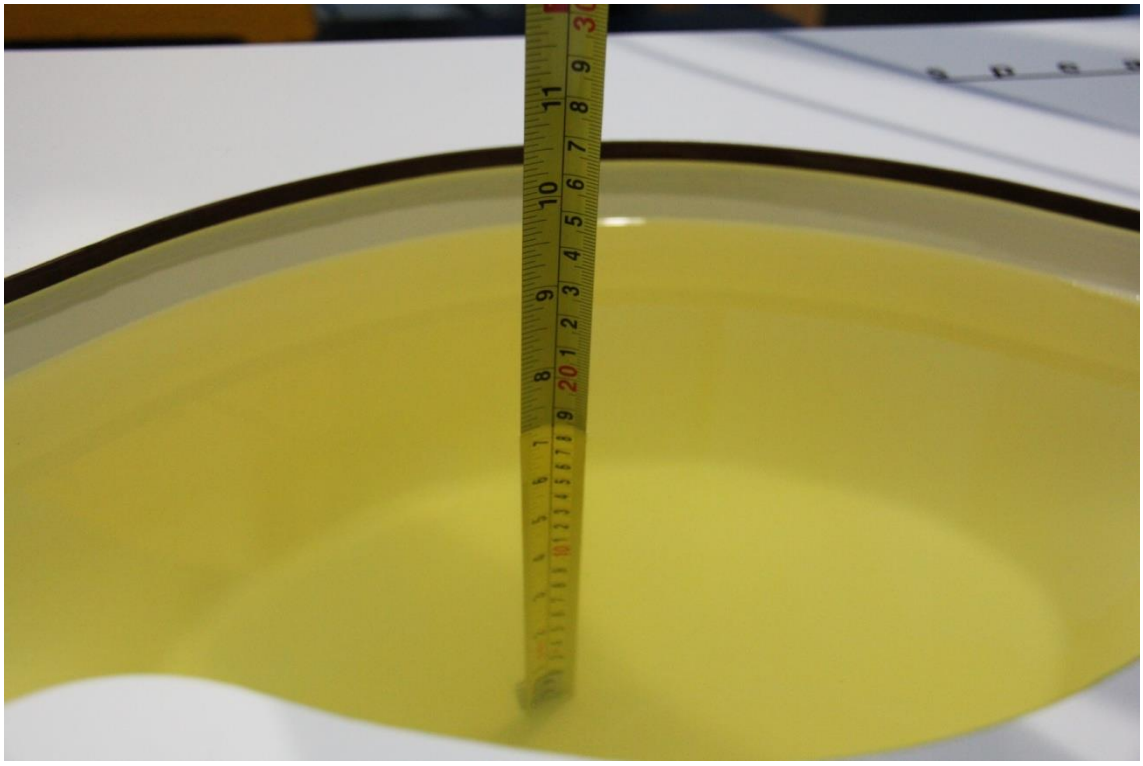
Picture 7-5 Liquid depth in the Head Phantom (1750 MHz)



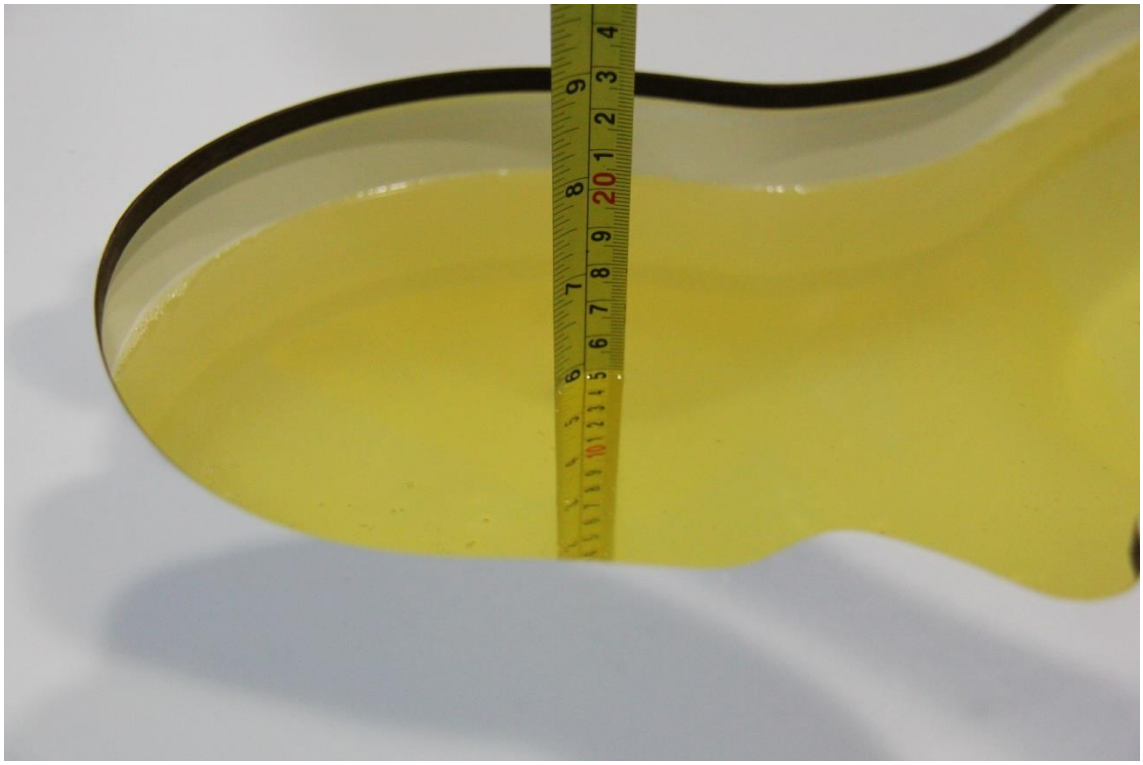
Picture 7-6 Liquid depth in the Flat Phantom (1750MHz)



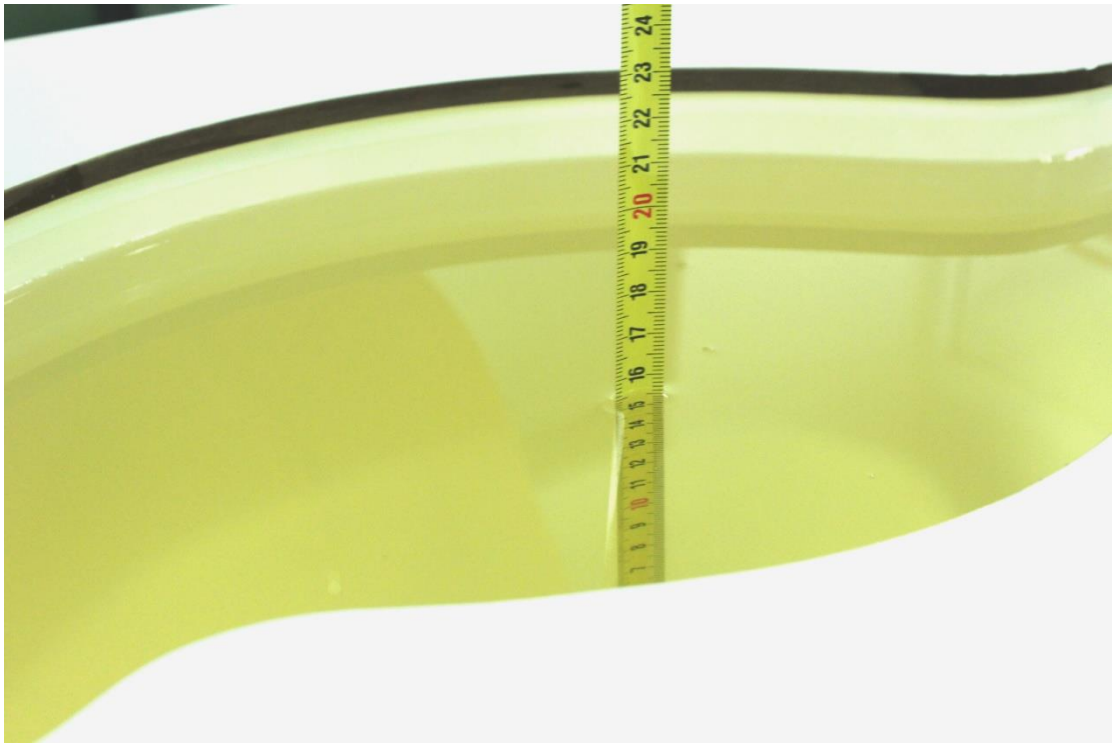
Picture 7-7 Liquid depth in the Head Phantom (1900 MHz)



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



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

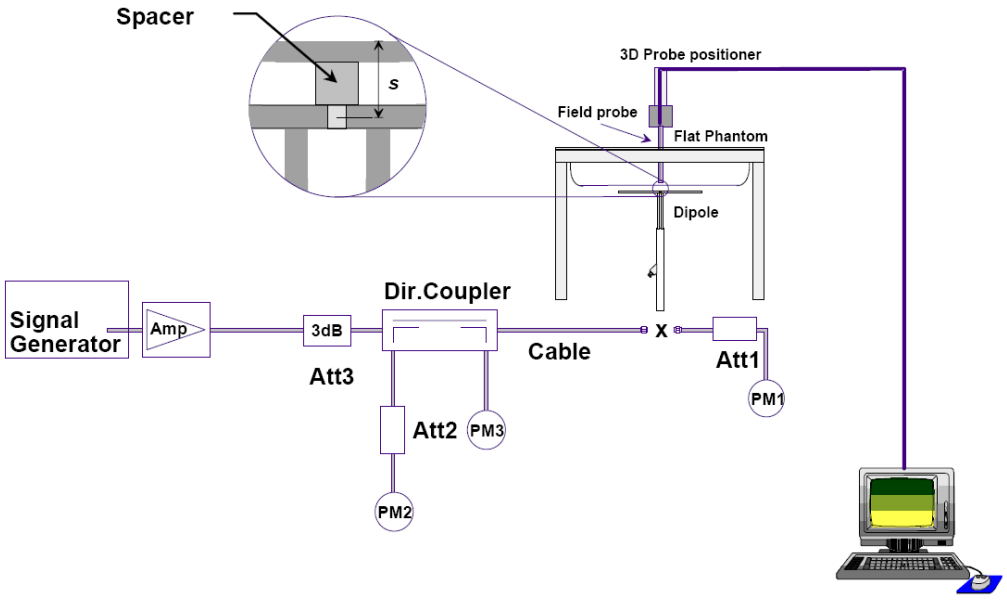


Picture 7-10 Liquid depth in the Flat Phantom (2450MHz)

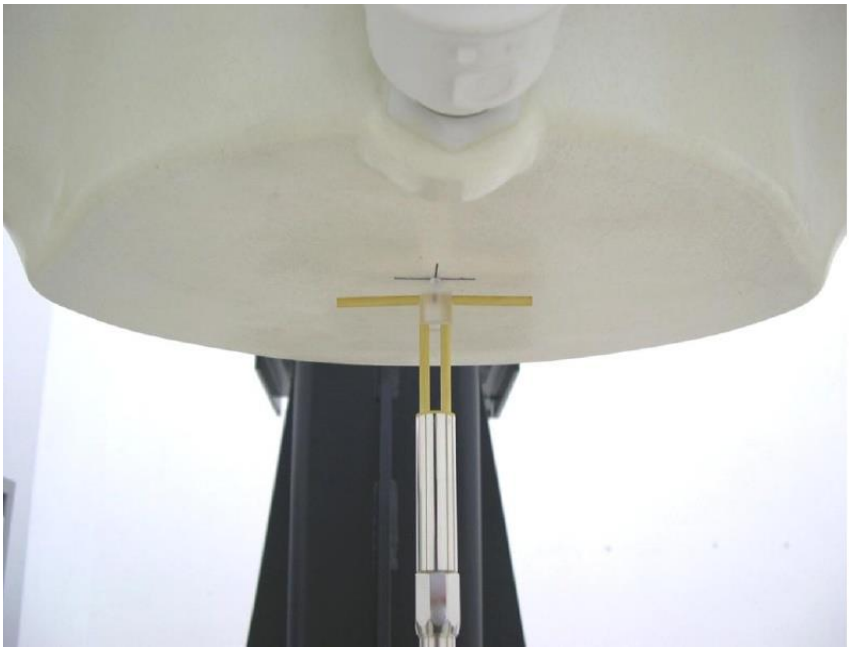
8 System verification

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
2018/7/5	750 MHz	5.42	8.32	5.44	8.16	0.37%	-1.92%
2018/7/6	835 MHz	6.06	9.37	6.16	9.4	1.65%	0.32%
2018/7/7	1750 MHz	19.4	36.7	19.48	36.28	0.41%	-1.14%
2018/7/8	1900 MHz	21.0	40.0	21.04	40.08	0.19%	0.20%
2018/7/9	2450 MHz	24.7	52.2	25.08	52.16	1.54%	-0.08%

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
2018/7/5	750 MHz	5.68	8.66	5.68	8.68	0.00%	0.23%
2018/7/6	835 MHz	6.12	9.41	6.04	9.28	-1.31%	-1.38%
2018/7/7	1750 MHz	19.8	37.1	20	37.64	1.01%	1.46%
2018/7/8	1900 MHz	21.5	40.5	21.4	41.2	-0.47%	1.73%
2018/7/9	2450 MHz	23.8	50.4	23.68	50.76	-0.50%	0.71%

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.

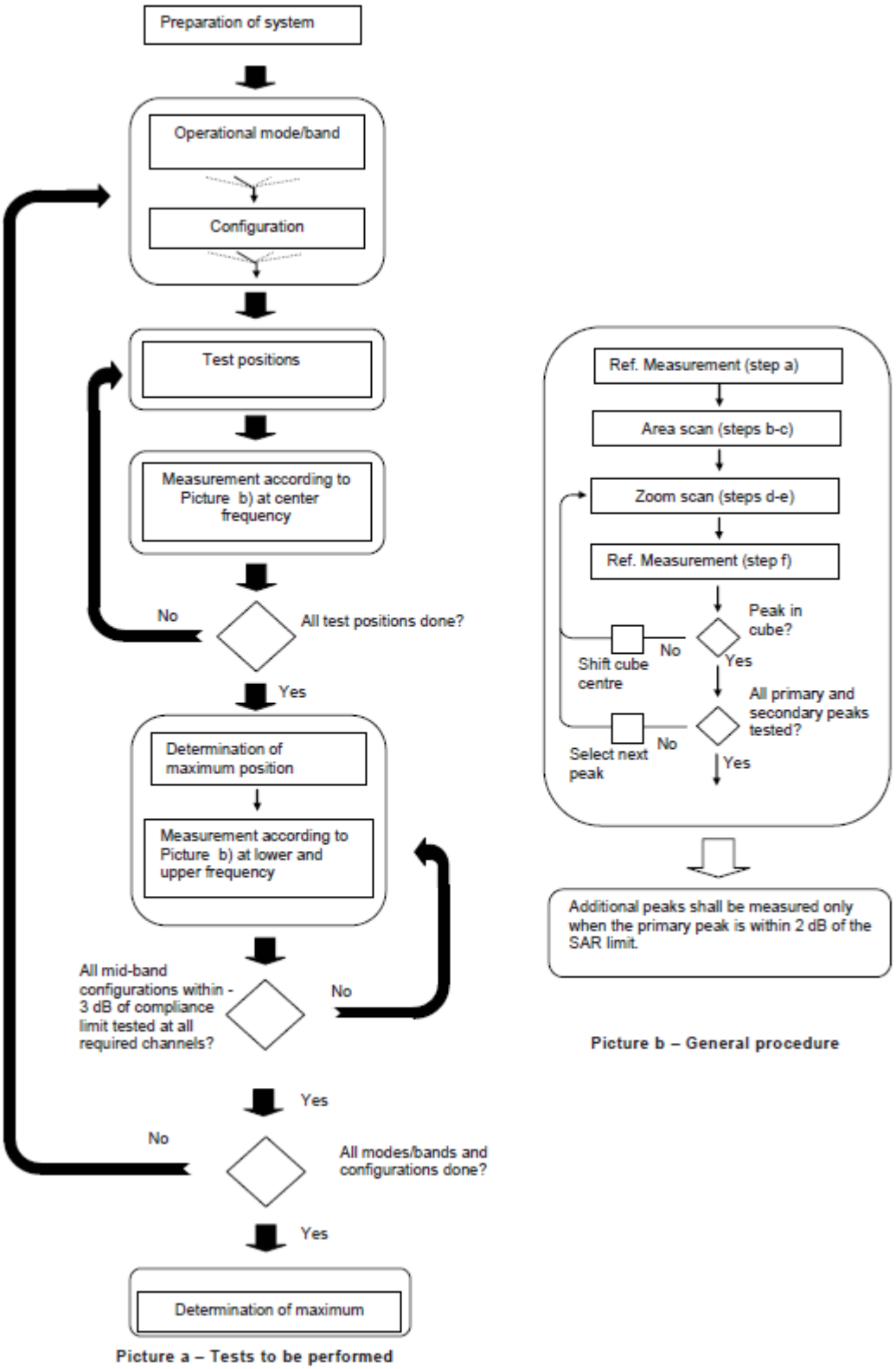
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the center of the transmit frequency band (f_c) for:

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 GSM850 #1

GSM850 #1								
		Measured Power (dBm)			Caculation	Frame Burst Power （dBm）		
Config	Tune-up	CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz		CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz
GSM Speech	32.50	31.94	32.01	31.95				
GPRS 1 Txslot	32.50	31.93	31.96	31.88	-9.03	22.90	22.93	22.85
GPRS 2 Txslots	31.00	30.34	30.34	30.28	-6.02	24.32	24.32	24.26
GPRS 3 Txslots	29.00	28.31	28.32	28.24	-4.26	24.05	24.06	23.98
GPRS 4 Txslots	28.50	27.71	27.76	27.65	-3.01	24.70	24.75	24.64
EGPRS GMSK 1 Txslot	32.50	31.86	31.93	31.86	-9.03	22.83	22.90	22.83
EGPRS GMSK 2 Txslots	31.00	30.27	30.32	30.27	-6.02	24.25	24.30	24.25
EGPRS GMSK 3 Txslots	29.00	28.26	28.30	28.25	-4.26	24.00	24.04	23.99
EGPRS GMSK 4 Txslots	28.50	27.67	27.74	27.65	-3.01	24.66	24.73	24.64
EGPRS 8PSK 1 Txslot	28.00	27.13	27.68	27.11	-9.03	18.10	18.65	18.08
EGPRS 8PSK 2 Txslots	27.00	25.93	25.64	25.78	-6.02	19.91	19.62	19.76
EGPRS 8PSK 3 Txslots	26.00	25.10	25.05	25.17	-4.26	20.84	20.79	20.91
EGPRS 8PSK 4 Txslots	25.00	23.76	23.59	23.67	-3.01	20.75	20.58	20.66

Table 11-2 PCS1900 #1

PCS1900 #1								
		Measured Power (dBm)			Caculation	Frame Burst Power （dBm）		
Config	Tune-up	CH810 1909.8 MHz	CH661 1880 MHz	CH512 1850.2 MHz		CH810 1909.8 MHz	CH661 1880 MHz	CH512 1850.2 MHz
GSM Speech	30.30	29.87	29.63	29.46				
GPRS 1 Txslot	30.30	29.86	29.62	29.44	-9.03	20.83	20.59	20.41
GPRS 2 Txslots	27.50	27.13	26.86	26.66	-6.02	21.11	20.84	20.64
GPRS 3 Txslots	25.50	25.15	24.86	24.63	-4.26	20.89	20.60	20.37
GPRS 4 Txslots	25.00	24.73	24.44	24.20	-3.01	21.72	21.43	21.19
EGPRS GMSK 1 Txslot	30.30	29.85	29.60	29.43	-9.03	20.82	20.57	20.40
EGPRS GMSK 2 Txslots	27.50	27.15	26.86	26.65	-6.02	21.13	20.84	20.63
EGPRS GMSK 3 Txslots	25.50	25.17	24.86	24.63	-4.26	20.91	20.60	20.37
EGPRS GMSK 4 Txslots	25.00	24.73	24.43	24.20	-3.01	21.72	21.42	21.19
EGPRS 8PSK 1 Txslot	27.50	27.21	27.49	27.27	-9.03	18.18	18.46	18.24
EGPRS 8PSK 2 Txslots	25.00	24.57	24.67	24.80	-6.02	18.55	18.65	18.78
EGPRS 8PSK 3 Txslots	24.00	23.33	23.48	23.56	-4.26	19.07	19.22	19.30
EGPRS 8PSK 4 Txslots	23.50	23.15	23.33	23.31	-3.01	20.14	20.32	20.30

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

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

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

According to the conducted power as above, the body measurements are performed with 4Txslots for 850MHz and 1900MHz.

11.2 WCDMA Measurement result

Table 11-3 WCDMA1900-BII #1

WCDMA1900-BII #1					
			Measured Power (dBm)		
Item		Tune-up	CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz
WCDMA	RMC	24.00	23.60	23.66	23.72
HSUPA	subtest1	21.00	20.20	20.50	20.70
	subtest2	21.00	20.30	20.60	20.80
	subtest3	22.00	20.70	20.80	20.90
	subtest4	20.50	19.40	19.50	19.70
	subtest5	22.00	21.90	21.90	22.00
HSPA+	\	22.50	21.78	21.89	21.94
DC-HSDPA	subtest1	22.50	22.34	22.41	22.50
	subtest2	22.50	22.32	22.42	22.50
	subtest3	22.50	22.33	22.39	22.50
	subtest4	22.50	22.32	22.40	22.49

Table 11-4 WCDMA1700-BIV #1

WCDMA1700-BIV #1					
			Measured Power (dBm)		
Item		Tune-up	CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz
WCDMA	RMC	24.00	23.51	23.39	23.43
HSUPA	subtest1	21.00	19.20	19.00	19.40
	subtest2	21.00	19.30	19.10	19.50
	subtest3	22.00	20.50	20.40	20.20
	subtest4	20.50	19.10	18.90	20.00
	subtest5	22.00	21.60	21.40	21.50
HSPA+	\	22.50	21.73	21.68	21.66
DC-HSDPA	subtest1	22.50	22.28	22.22	22.24
	subtest2	22.50	22.26	22.21	22.25
	subtest3	22.50	22.25	22.20	22.26
	subtest4	22.50	22.27	22.23	22.25

Table 11-5 WCDMA850-BV #1

WCDMA850-BV #1					
			Measured Power (dBm)		
Item		Tune-up	CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz
WCDMA	RMC	24.00	23.45	23.51	23.44
HSUPA	subtest1	21.00	19.30	20.40	20.50
	subtest2	21.00	19.40	20.50	20.60
	subtest3	22.00	20.10	20.00	21.00
	subtest4	20.50	19.40	19.50	20.50
	subtest5	22.00	21.90	21.90	22.00
HSPA+	\	22.50	21.58	21.71	21.56
DC-HSDPA	subtest1	22.50	22.09	22.21	22.14
	subtest2	22.50	22.08	22.23	22.13
	subtest3	22.50	22.07	22.22	22.13
	subtest4	22.50	22.08	22.24	22.12

11.3 LTE Measurement result

Table 11-6 LTE1900-FDD2 #1

LTE1900-FDD2 #1							
SN				Measured Power (dBm) & MPR			
				QPSK		16QAM	
BandWidth	RB No./Start	Channel	Tune-up	Measured Power	MPR	Measured Power	MPR
1.4MHz	1H	19193	24.5	23.64	0	22.59	1
		18900	24.5	23.71	0	22.80	1
		18607	24.5	23.75	0	23.10	1
	1M	19193	24.5	23.86	0	22.73	1
		18900	24.5	23.89	0	22.98	1
		18607	24.5	23.94	0	23.29	1
	1L	19193	24.5	23.63	0	22.61	1
		18900	24.5	23.73	0	22.77	1
		18607	24.5	23.76	0	23.10	1
	3H	19193	24.5	23.66	0	22.75	1
		18900	24.5	23.73	0	22.83	1
		18607	24.5	23.80	0	23.01	1
	3M	19193	24.5	23.65	0	22.81	1
		18900	24.5	23.81	0	22.89	1
		18607	24.5	23.87	0	23.05	1
	3L	19193	24.5	23.61	0	22.76	1
		18900	24.5	23.74	0	22.83	1
		18607	24.5	23.81	0	23.01	1
	6	19193	24.5	22.87	1	21.86	2
		18900	24.5	22.82	1	21.91	2
		18607	24.5	22.86	1	21.73	2
3MHz	1H	19185	24.5	23.69	0	22.58	1
		18900	24.5	23.73	0	22.61	1
		18615	24.5	23.80	0	23.16	1
	1M	19185	24.5	23.83	0	22.77	1
		18900	24.5	23.86	0	22.79	1
		18615	24.5	23.98	0	23.30	1
	1L	19185	24.5	23.67	0	22.66	1
		18900	24.5	23.69	0	22.64	1
		18615	24.5	23.82	0	23.11	1
	8H	19185	24.5	22.77	1	21.73	2
		18900	24.5	22.80	1	21.86	2
		18615	24.5	22.84	1	21.92	2
	8M	19185	24.5	22.82	1	21.78	2
		18900	24.5	22.82	1	21.97	2
		18615	24.5	22.90	1	21.94	2
	8L	19185	24.5	22.81	1	21.74	2
		18900	24.5	22.84	1	21.88	2
		18615	24.5	22.87	1	21.89	2
	15	19185	24.5	22.73	1	21.67	2
		18900	24.5	22.82	1	21.82	2
		18615	24.5	22.83	1	21.83	2
5MHz	1H	19175	24.5	23.62	0	22.60	1
		18900	24.5	23.70	0	22.80	1
		18625	24.5	23.68	0	23.19	1
	1M	19175	24.5	23.91	0	22.91	1
		18900	24.5	24.00	0	23.06	1
		18625	24.5	23.94	0	23.46	1
	1L	19175	24.5	23.60	0	22.63	1
		18900	24.5	23.72	0	22.82	1
		18625	24.5	23.65	0	23.19	1
	12H	19175	24.5	22.73	1	21.73	2
		18900	24.5	22.76	1	21.84	2
		18625	24.5	22.82	1	21.95	2
	12M	19175	24.5	22.79	1	21.75	2
		18900	24.5	22.83	1	21.88	2
		18625	24.5	22.85	1	21.99	2
	12L	19175	24.5	22.67	1	21.72	2
		18900	24.5	22.77	1	21.84	2
		18625	24.5	22.81	1	21.91	2
	25	19175	24.5	22.72	1	21.63	2
		18900	24.5	22.79	1	21.78	2
		18625	24.5	22.83	1	21.85	2

10MHz	1H	19150	24.5	23.69	0	22.59	1
		18900	24.5	23.68	0	22.64	1
		18650	24.5	23.76	0	23.07	1
	1M	19150	24.5	23.69	0	22.75	1
		18900	24.5	23.82	0	22.73	1
		18650	24.5	23.88	0	23.23	1
	1L	19150	24.5	23.71	0	22.62	1
		18900	24.5	23.70	0	22.61	1
		18650	24.5	23.76	0	23.11	1
	25H	19150	24.5	22.80	1	21.86	2
		18900	24.5	22.83	1	21.85	2
		18650	24.5	22.94	1	21.96	2
	25M	19150	24.5	22.77	1	21.82	2
		18900	24.5	22.81	1	21.81	2
		18650	24.5	22.82	1	21.81	2
	25L	19150	24.5	22.86	1	21.87	2
		18900	24.5	22.85	1	21.84	2
		18650	24.5	22.83	1	21.84	2
	50	19150	24.5	22.81	1	21.80	2
		18900	24.5	22.85	1	21.82	2
		18650	24.5	22.88	1	21.90	2
15MHz	1H	19125	24.5	23.64	0	22.81	1
		18900	24.5	23.57	0	22.54	1
		18675	24.5	23.64	0	22.86	1
	1M	19125	24.5	23.79	0	22.95	1
		18900	24.5	23.74	0	22.67	1
		18675	24.5	23.78	0	23.10	1
	1L	19125	24.5	23.64	0	22.85	1
		18900	24.5	23.64	0	22.51	1
		18675	24.5	23.70	0	23.04	1
	36H	19125	24.5	22.87	1	21.76	2
		18900	24.5	22.87	1	21.84	2
		18675	24.5	22.87	1	21.89	2
	36M	19125	24.5	22.87	1	21.77	2
		18900	24.5	22.88	1	21.81	2
		18675	24.5	22.85	1	21.87	2
	36L	19125	24.5	22.96	1	21.81	2
		18900	24.5	22.91	1	21.87	2
		18675	24.5	22.82	1	21.85	2
	75	19125	24.5	22.92	1	21.81	2
		18900	24.5	22.93	1	21.88	2
		18675	24.5	22.89	1	21.83	2
20MHz	1H	19100	24.5	23.38	0	22.70	1
		18900	24.5	23.41	0	22.77	1
		18700	24.5	23.44	0	22.94	1
	1M	19100	24.5	23.82	0	**23.10**	1
		18900	24.5	23.86	0	**23.26**	1
		18700	24.5	23.88	0	**23.37**	1
	1L	19100	24.5	23.40	0	22.81	1
		18900	24.5	23.44	0	22.78	1
		18700	24.5	23.44	0	23.00	1
	50H	19100	24.5	22.60	1	21.62	2
		18900	24.5	22.83	1	21.84	2
		18700	24.5	22.80	1	21.77	2
	50M	19100	24.5	22.69	1	21.70	2
		18900	24.5	22.80	1	21.76	2
		18700	24.5	22.76	1	21.79	2
	50L	19100	24.5	22.72	1	21.68	2
		18900	24.5	22.88	1	21.83	2
		18700	24.5	22.63	1	21.64	2
	100	19100	24.5	22.68	1	21.64	2
		18900	24.5	22.90	1	21.85	2
		18700	24.5	22.77	1	21.75	2

Table 11-7 LTE850-FDD5 #1

LTE850-FDD5 #1							
				Measured Power (dBm) & MPR			
				QPSK		16QAM	
BandWidth	RB No./Start	Channel	Tune-up	Measured Power	MPR	Measured Power	MPR
1.4MHz	1H	20643	24.5	23.66	0	22.62	1
		20525	24.5	23.71	0	23.01	1
		20407	24.5	23.69	0	22.74	1
	1M	20643	24.5	23.86	0	22.82	1
		20525	24.5	23.86	0	23.19	1
		20407	24.5	23.89	0	22.90	1
	1L	20643	24.5	23.63	0	22.63	1
		20525	24.5	23.73	0	23.04	1
		20407	24.5	23.72	0	22.69	1
	3H	20643	24.5	23.69	0	22.63	1
		20525	24.5	23.80	0	22.92	1
		20407	24.5	23.80	0	22.73	1
	3M	20643	24.5	23.75	0	22.70	1
		20525	24.5	23.83	0	22.93	1
		20407	24.5	23.81	0	22.78	1
	3L	20643	24.5	23.70	0	22.69	1
		20525	24.5	23.74	0	22.93	1
		20407	24.5	23.74	0	22.75	1
	6	20643	24.5	22.84	1	21.85	2
		20525	24.5	22.78	1	21.64	2
		20407	24.5	22.84	1	21.89	2
3MHz	1H	20635	24.5	23.70	0	22.54	1
		20525	24.5	23.78	0	22.62	1
		20415	24.5	23.82	0	23.03	1
	1M	20635	24.5	23.80	0	22.73	1
		20525	24.5	23.86	0	22.67	1
		20415	24.5	23.95	0	23.18	1
	1L	20635	24.5	23.72	0	22.66	1
		20525	24.5	23.69	0	22.57	1
		20415	24.5	23.82	0	22.99	1
	8H	20635	24.5	22.74	1	21.69	2
		20525	24.5	22.74	1	21.79	2
		20415	24.5	22.79	1	21.76	2
	8M	20635	24.5	22.78	1	21.75	2
		20525	24.5	22.81	1	21.84	2
		20415	24.5	22.81	1	21.81	2
	8L	20635	24.5	22.68	1	21.67	2
		20525	24.5	22.76	1	21.81	2
		20415	24.5	22.79	1	21.76	2
	15	20635	24.5	22.66	1	21.59	2
		20525	24.5	22.73	1	21.73	2
		20415	24.5	22.72	1	21.72	2
5MHz	1H	20625	24.5	23.69	0	22.60	1
		20525	24.5	23.71	0	22.73	1
		20425	24.5	23.69	0	23.10	1
	1M	20625	24.5	23.86	0	22.88	1
		20525	24.5	23.97	0	22.97	1
		20425	24.5	23.92	0	23.31	1
	1L	20625	24.5	23.65	0	22.68	1
		20525	24.5	23.74	0	22.72	1
		20425	24.5	23.70	0	23.07	1
	12H	20625	24.5	22.74	1	21.69	2
		20525	24.5	22.67	1	21.71	2
		20425	24.5	22.72	1	21.82	2
	12M	20625	24.5	22.70	1	21.72	2
		20525	24.5	22.75	1	21.78	2
		20425	24.5	22.75	1	21.85	2
	12L	20625	24.5	22.61	1	21.63	2
		20525	24.5	22.72	1	21.72	2
		20425	24.5	22.62	1	21.70	2
	25	20625	24.5	22.64	1	21.56	2
		20525	24.5	22.73	1	21.69	2
		20425	24.5	22.69	1	21.71	2

10MHz	1H	20600	24.5	23.69	0	22.56	1
		20525	24.5	23.75	0	22.58	1
		20450	24.5	23.75	0	22.98	1
	1M	20600	24.5	23.81	0	**22.75**	1
		20525	24.5	23.81	0	**22.68**	1
		20450	24.5	23.84	0	**23.11**	1
	1L	20600	24.5	23.68	0	22.63	1
		20525	24.5	23.69	0	22.51	1
		20450	24.5	23.76	0	22.93	1
	25H	20600	24.5	22.79	1	21.82	2
		20525	24.5	22.73	1	21.71	2
		20450	24.5	22.69	1	21.71	2
	25M	20600	24.5	22.77	1	21.79	2
		20525	24.5	22.79	1	21.76	2
		20450	24.5	22.74	1	21.68	2
	25L	20600	24.5	22.73	1	21.79	2
		20525	24.5	22.77	1	21.73	2
		20450	24.5	22.64	1	21.68	2
	50	20600	24.5	22.82	1	21.74	2
		20525	24.5	22.79	1	21.75	2
		20450	24.5	22.66	1	21.67	2

Table 11-8 LTE700-FDD12 #1

LTE700-FDD12 #1							
				Measured Power (dBm) & MPR			
				QPSK		16QAM	
BandWidth	RB No./Start	Channel	Tune-up	Measured Power	MPR	Measured Power	MPR
1.4MHz	1H	23173	24.5	23.65	0	22.66	1
		23095	24.5	23.80	0	23.09	1
		23017	24.5	23.76	0	22.66	1
	1M	23173	24.5	23.87	0	22.87	1
		23095	24.5	23.99	0	23.22	1
		23017	24.5	23.99	0	22.83	1
	1L	23173	24.5	23.65	0	22.67	1
		23095	24.5	23.82	0	23.07	1
		23017	24.5	23.80	0	22.65	1
	3H	23173	24.5	23.78	0	22.67	1
		23095	24.5	23.80	0	22.95	1
		23017	24.5	23.82	0	22.91	1
	3M	23173	24.5	23.83	0	22.72	1
		23095	24.5	23.89	0	22.99	1
		23017	24.5	23.85	0	22.95	1
	3L	23173	24.5	23.68	0	22.72	1
		23095	24.5	23.86	0	22.99	1
		23017	24.5	23.79	0	22.87	1
	6	23173	24.5	22.79	1	21.91	2
		23095	24.5	22.85	1	21.76	2
		23017	24.5	22.90	1	22.00	2
3MHz	1H	23165	24.5	23.73	0	22.57	1
		23095	24.5	23.85	0	22.62	1
		23025	24.5	23.86	0	23.08	1
	1M	23165	24.5	23.87	0	22.82	1
		23095	24.5	23.94	0	22.77	1
		23025	24.5	24.02	0	23.21	1
	1L	23165	24.5	23.73	0	22.66	1
		23095	24.5	23.79	0	22.65	1
		23025	24.5	23.92	0	23.07	1
	8H	23165	24.5	22.77	1	21.78	2
		23095	24.5	22.82	1	21.94	2
		23025	24.5	22.85	1	21.90	2
	8M	23165	24.5	22.81	1	21.87	2
		23095	24.5	22.90	1	21.99	2
		23025	24.5	22.89	1	21.96	2
	8L	23165	24.5	22.79	1	21.83	2
		23095	24.5	22.82	1	21.97	2
		23025	24.5	22.83	1	21.89	2
	15	23165	24.5	22.71	1	21.70	2
		23095	24.5	22.79	1	21.87	2
		23025	24.5	22.78	1	21.84	2
5MHz	1H	23155	24.5	23.67	0	22.62	1
		23095	24.5	23.77	0	22.78	1
		23035	24.5	23.74	0	23.18	1
	1M	23155	24.5	23.93	0	22.92	1
		23095	24.5	24.09	0	23.07	1
		23035	24.5	24.00	0	23.39	1
	1L	23155	24.5	23.65	0	22.68	1
		23095	24.5	23.82	0	22.79	1
		23035	24.5	23.74	0	23.10	1
	12H	23155	24.5	22.64	1	21.72	2
		23095	24.5	22.81	1	21.92	2
		23035	24.5	22.77	1	21.88	2
	12M	23155	24.5	22.77	1	21.88	2
		23095	24.5	22.82	1	21.95	2
		23035	24.5	22.82	1	22.00	2
	12L	23155	24.5	22.67	1	21.76	2
		23095	24.5	22.78	1	21.87	2
		23035	24.5	22.70	1	21.86	2
	25	23155	24.5	22.65	1	21.61	2
		23095	24.5	22.81	1	21.85	2
		23035	24.5	22.72	1	21.81	2

10MHz	1H	23130	24.5	23.74	0	22.65	1
		23095	24.5	23.78	0	22.56	1
		23060	24.5	23.88	0	23.08	1
	1M	23130	24.5	23.83	0	**22.76**	1
		23095	24.5	23.89	0	**22.70**	1
		23060	24.5	23.97	0	**23.13**	1
	1L	23130	24.5	23.76	0	22.70	1
		23095	24.5	23.78	0	22.61	1
		23060	24.5	23.84	0	23.01	1
	25H	23130	24.5	22.68	1	21.77	2
		23095	24.5	22.96	1	21.99	2
		23060	24.5	22.82	1	21.88	2
	25M	23130	24.5	22.80	1	21.91	2
		23095	24.5	22.82	1	21.90	2
		23060	24.5	22.84	1	21.90	2
	25L	23130	24.5	22.69	1	21.80	2
		23095	24.5	22.91	1	21.94	2
		23060	24.5	22.86	1	21.87	2
	50	23130	24.5	22.71	1	21.75	2
		23095	24.5	22.91	1	21.95	2
		23060	24.5	22.84	1	21.87	2

Table 11-9 LTE1700-FDD66 #1

LTE1700-FDD66 #1							
SN				Measured Power (dBm) & MPR			
				QPSK		16QAM	
BandWidth	RB No./Start	Channel	Tune-up	Measured Power	MPR	Measured Power	MPR
1.4MHz	1H	132665	24	23.43	0	22.40	1
		132322	24	23.36	0	22.27	1
		131979	24	23.23	0	22.28	1
	1M	132665	24	23.68	0	22.58	1
		132322	24	23.45	0	22.49	1
		131979	24	23.42	0	22.49	1
	1L	132665	24	23.44	0	22.41	1
		132322	24	23.36	0	22.30	1
		131979	24	23.24	0	22.29	1
	3H	132665	24	23.55	0	22.58	1
		132322	24	23.43	0	22.54	1
		131979	24	23.36	0	22.31	1
	3M	132665	24	23.52	0	22.71	1
		132322	24	23.46	0	22.62	1
		131979	24	23.37	0	22.38	1
	3L	132665	24	23.48	0	22.63	1
		132322	24	23.43	0	22.51	1
		131979	24	23.30	0	22.33	1
	6	132665	24	22.62	1	21.66	2
		132322	24	22.39	1	21.48	2
		131979	24	22.39	1	21.44	2
3MHz	1H	132657	24	23.60	0	22.40	1
		132322	24	23.30	0	22.29	1
		131987	24	23.35	0	22.25	1
	1M	132657	24	23.72	0	22.62	1
		132322	24	23.51	0	22.49	1
		131987	24	23.47	0	22.47	1
	1L	132657	24	23.56	0	22.50	1
		132322	24	23.34	0	22.36	1
		131987	24	23.27	0	22.33	1
	8H	132657	24	22.57	1	21.54	2
		132322	24	22.41	1	21.39	2
		131987	24	22.34	1	21.33	2
	8M	132657	24	22.60	1	21.59	2
		132322	24	22.44	1	21.48	2
		131987	24	22.40	1	21.42	2
	8L	132657	24	22.58	1	21.55	2
		132322	24	22.36	1	21.34	2
		131987	24	22.36	1	21.35	2
	15	132657	24	22.56	1	21.51	2
		132322	24	22.34	1	21.29	2
		131987	24	22.35	1	21.28	2
5MHz	1H	132647	24	23.56	0	22.44	1
		132322	24	23.27	0	22.29	1
		131997	24	23.31	0	22.28	1
	1M	132647	24	23.83	0	22.71	1
		132322	24	23.43	0	22.44	1
		131997	24	23.62	0	22.58	1
	1L	132647	24	23.56	0	22.41	1
		132322	24	23.31	0	22.24	1
		131997	24	23.31	0	22.27	1
	12H	132647	24	22.51	1	21.48	2
		132322	24	22.33	1	21.38	2
		131997	24	22.29	1	21.33	2
	12M	132647	24	22.58	1	21.62	2
		132322	24	22.40	1	21.42	2
		131997	24	22.32	1	21.42	2
	12L	132647	24	22.51	1	21.57	2
		132322	24	22.31	1	21.35	2
		131997	24	22.28	1	21.30	2
	25	132647	24	22.53	1	21.41	2
		132322	24	22.32	1	21.24	2
		131997	24	22.25	1	21.23	2

10MHz	1H	132622	24	23.49	0	22.43	1
		132322	24	23.34	0	22.25	1
		132022	24	23.32	0	22.16	1
	1M	132622	24	23.67	0	22.51	1
		132322	24	23.47	0	22.44	1
		132022	24	23.40	0	22.24	1
	1L	132622	24	23.47	0	22.37	1
		132322	24	23.31	0	22.30	1
		132022	24	23.27	0	22.13	1
	25H	132622	24	22.54	1	21.56	2
		132322	24	22.38	1	21.44	2
		132022	24	22.43	1	21.39	2
	25M	132622	24	22.57	1	21.62	2
		132322	24	22.40	1	21.47	2
		132022	24	22.40	1	21.38	2
	25L	132622	24	22.55	1	21.61	2
		132322	24	22.37	1	21.41	2
		132022	24	22.30	1	21.31	2
	50	132622	24	22.56	1	21.52	2
		132322	24	22.36	1	21.41	2
		132022	24	22.39	1	21.34	2
15MHz	1H	132597	24	23.44	0	22.66	1
		132322	24	23.32	0	22.70	1
		132047	24	23.26	0	22.55	1
	1M	132597	24	23.53	0	22.76	1
		132322	24	23.42	0	22.70	1
		132047	24	23.44	0	22.66	1
	1L	132597	24	23.39	0	22.58	1
		132322	24	23.27	0	22.61	1
		132047	24	23.24	0	22.52	1
	36H	132597	24	22.59	1	21.50	2
		132322	24	22.43	1	21.36	2
		132047	24	22.45	1	21.38	2
	36M	132597	24	22.61	1	21.52	2
		132322	24	22.39	1	21.35	2
		132047	24	22.39	1	21.31	2
	36L	132597	24	22.57	1	21.50	2
		132322	24	22.37	1	21.30	2
		132047	24	22.36	1	21.25	2
	75	132597	24	22.59	1	21.47	2
		132322	24	22.39	1	21.33	2
		132047	24	22.46	1	21.34	2
20MHz	1H	132572	24	23.22	0	22.67	1
		132322	24	23.10	0	22.42	1
		132072	24	23.06	0	22.42	1
	1M	132572	24	23.55	0	**23.00**	1
		132322	24	23.49	0	**22.82**	1
		132072	24	23.52	0	**22.84**	1
	1L	132572	24	23.08	0	22.59	1
		132322	24	23.01	0	22.37	1
		132072	24	23.02	0	22.37	1
	50H	132572	24	22.34	1	21.37	2
		132322	24	22.34	1	21.33	2
		132072	24	22.35	1	21.33	2
	50M	132572	24	22.45	1	21.47	2
		132322	24	22.34	1	21.32	2
		132072	24	22.36	1	21.35	2
	50L	132572	24	22.46	1	21.45	2
		132322	24	22.32	1	21.29	2
		132072	24	22.30	1	21.27	2
	100	132572	24	22.43	1	21.43	2
		132322	24	22.36	1	21.34	2
		132072	24	22.32	1	21.31	2

Table 11-10 LTE700-FDD71 #1

LTE700-FDD71 #1							
				Measured Power (dBm) & MPR			
				QPSK		16QAM	
BandWidth	RB No./Start	Channel	Tune-up	Measured Power	MPR	Measured Power	MPR
5MHz	1H	133447	24	23.26	0	22.18	1
		133297	24	23.29	0	22.22	1
		133147	24	23.40	0	22.34	1
	1M	133447	24	23.38	0	22.28	1
		133297	24	23.42	0	22.32	1
		133147	24	23.57	0	22.41	1
	1L	133447	24	23.27	0	22.18	1
		133297	24	23.30	0	22.21	1
		133147	24	23.37	0	22.27	1
	12H	133447	24	22.47	1	21.51	2
		133297	24	22.49	1	21.55	2
		133147	24	22.60	1	21.63	2
	12M	133447	24	22.48	1	21.51	2
		133297	24	22.49	1	21.53	2
		133147	24	22.58	1	21.63	2
	12L	133447	24	22.40	1	21.43	2
		133297	24	22.38	1	21.44	2
		133147	24	22.50	1	21.53	2
	25	133447	24	22.46	1	21.41	2
		133297	24	22.48	1	21.43	2
		133147	24	22.60	1	21.51	2
10MHz	1H	132422	24	23.40	0	22.90	1
		133297	24	23.42	0	22.41	1
		133172	24	23.52	0	22.96	1
	1M	132422	24	23.61	0	22.96	1
		133297	24	23.54	0	22.64	1
		133172	24	23.72	0	23.00	1
	1L	132422	24	23.35	0	22.92	1
		133297	24	23.44	0	22.45	1
		133172	24	23.51	0	22.94	1
	25H	132422	24	22.51	1	21.47	2
		133297	24	22.53	1	21.48	2
		133172	24	22.66	1	21.61	2
	25M	132422	24	22.54	1	21.47	2
		133297	24	22.53	1	21.50	2
		133172	24	22.63	1	21.56	2
	25L	132422	24	22.51	1	21.46	2
		133297	24	22.50	1	21.47	2
		133172	24	22.53	1	21.45	2
	50	132422	24	22.49	1	21.44	2
		133297	24	22.51	1	21.49	2
		133172	24	22.56	1	21.46	2
15MHz	1H	133397	24	23.34	0	22.69	1
		133297	24	23.37	0	22.74	1
		133197	24	23.35	0	22.93	1
	1M	133397	24	23.44	0	22.77	1
		133297	24	23.42	0	22.76	1
		133197	24	23.46	0	22.93	1
	1L	133397	24	23.30	0	22.70	1
		133297	24	23.37	0	22.73	1
		133197	24	23.38	0	22.89	1
	36H	133397	24	22.61	1	21.51	2
		133297	24	22.63	1	21.54	2
		133197	24	22.66	1	21.44	2
	36M	133397	24	22.59	1	21.48	2
		133297	24	22.62	1	21.50	2
		133197	24	22.66	1	21.54	2
	36L	133397	24	22.53	1	21.42	2
		133297	24	22.56	1	21.43	2
		133197	24	22.58	1	21.45	2
	75	133397	24	22.60	1	21.46	2
		133297	24	22.59	1	21.48	2
		133197	24	22.66	1	21.51	2

20MHz	1H	133372	24	23.05	0	22.66	1
		133297	24	23.19	0	22.53	1
		133222	24	23.17	0	22.51	1
	1M	133372	24	23.51	0	**22.94**	1
		133297	24	23.53	0	**22.83**	1
		133222	24	23.60	0	**22.91**	1
	1L	133372	24	23.07	0	22.66	1
		133297	24	23.17	0	22.50	1
		133222	24	23.18	0	22.47	1
	50H	133372	24	22.51	1	21.40	2
		133297	24	22.54	1	21.50	2
		133222	24	22.57	1	21.52	2
	50M	133372	24	22.49	1	21.41	2
		133297	24	22.52	1	21.48	2
		133222	24	22.54	1	21.49	2
	50L	133372	24	22.38	1	21.33	2
		133297	24	22.37	1	21.36	2
		133222	24	22.36	1	21.33	2
	100	133372	24	22.46	1	21.39	2
		133297	24	22.48	1	21.47	2
		133222	24	22.50	1	21.48	2

11.4 Wi-Fi and BT Measurement result

Table 11-11 Bluetooth Power

Bluetooth Power				
Mode	Channel	Frequence	Tune-up	Measured
GFSK	78	2480 MHz	7	6.26
	39	2441 MHz	7	5.87
	0	2402 MHz	7	6.01
EDR2M-4_DQPSK	78	2480 MHz	6	4.98
	39	2441 MHz	6	4.64
	0	2402 MHz	6	4.7
EDR3M-8DPSK	78	2480 MHz	6	5.14
	39	2441 MHz	6	4.72
	0	2402 MHz	6	4.78

Table 11-12 WLAN2450 #1

Mode	Channel	Frequence	Data Rate	Tune-up	Measured
802.11b	11	2462 MHz	5.5Mbps	19.50	18.78
	6	2437 MHz		19.50	18.60
	1	2412 MHz		19.50	18.48
	11	2462 MHz	2Mbps	/	/
	6	2437 MHz		19.50	18.48
	1	2412 MHz		/	/
	11	2462 MHz	1Mbps	19.50	18.44
	6	2437 MHz		19.50	18.47
	1	2412 MHz		19.50	18.32
	11	2462 MHz	11Mbps	/	/
	6	2437 MHz		19.50	18.53
	1	2412 MHz		/	/
802.11g	11	2462 MHz	6Mbps	18.50	17.52
	6	2437 MHz		18.50	17.44
	1	2412 MHz		18.50	17.47
	11	2462 MHz	9Mbps	18.50	17.64
	6	2437 MHz		18.50	17.53
	1	2412 MHz		18.50	17.16
	11	2462 MHz	12Mbps	18.50	16.59
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	18Mbps	18.50	16.62
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	24Mbps	18.50	17.19
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	36Mbps	18.50	17.16
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	48Mbps	18.00	16.87
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	54Mbps	18.00	16.79
	6	2437 MHz		/	/
	1	2412 MHz		/	/

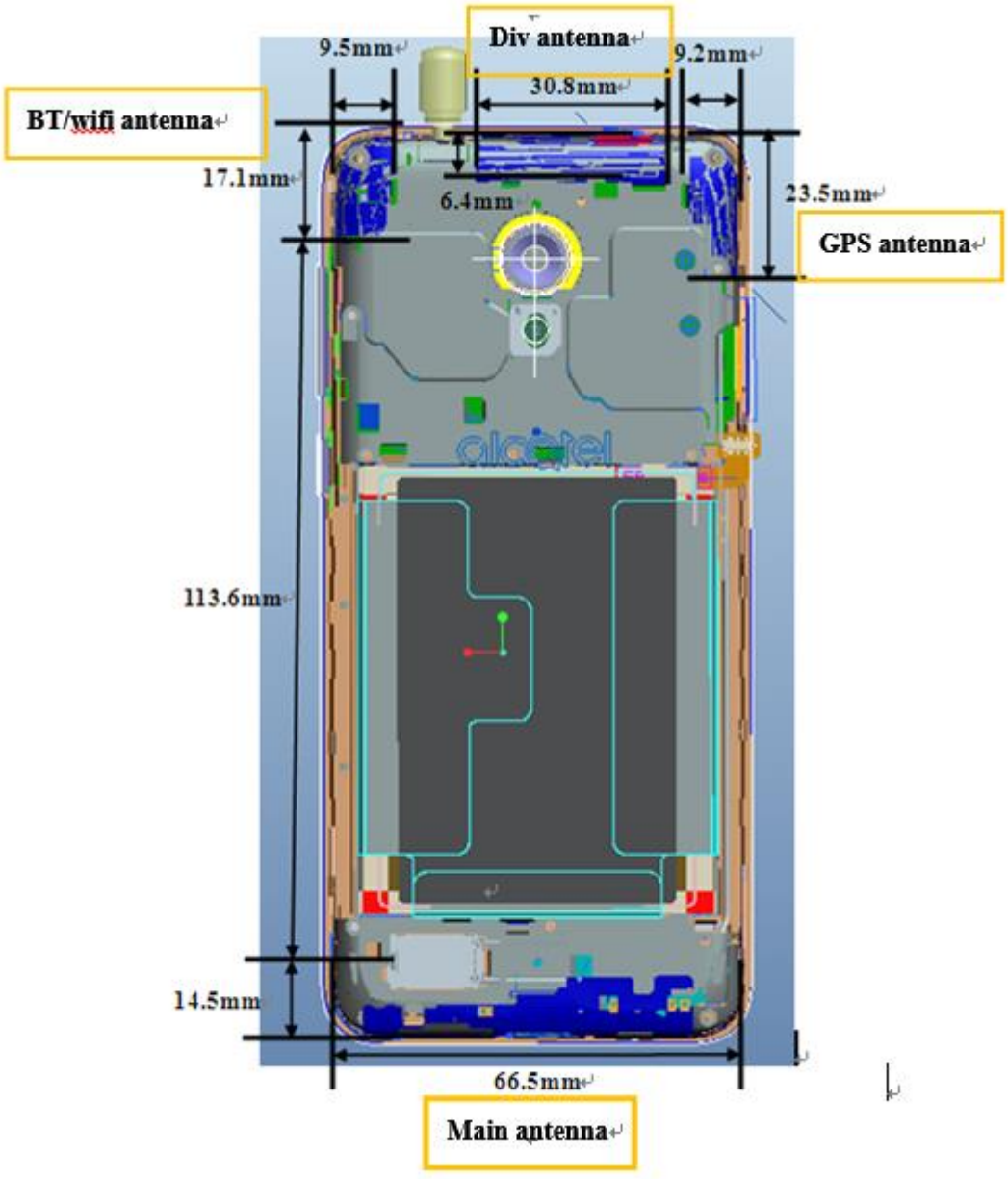
802.11n 20M	11	2462 MHz	MCS0	17.50	16.47
	6	2437 MHz		17.50	16.45
	1	2412 MHz		17.50	16.08
	11	2462 MHz	MCS1	17.50	16.46
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	MCS2	17.50	16.55
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	MCS3	17.50	16.15
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	MCS4	17.50	16.71
	6	2437 MHz		17.50	16.24
	1	2412 MHz		17.50	16.30
	11	2462 MHz	MCS5	16.50	15.55
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	MCS6	16.50	15.58
	6	2437 MHz		/	/
	1	2412 MHz		/	/
	11	2462 MHz	MCS7	16.50	15.53
	6	2437 MHz		/	/
	1	2412 MHz		/	/
802.11n 40M	9	2452 MHz	MCS0	16.20	15.75
	6	2437 MHz		16.20	15.68
	3	2422 MHz		16.20	15.28
	9	2452 MHz	MCS1	16.20	15.77
	6	2437 MHz		16.20	15.73
	3	2422 MHz		16.20	15.33
	9	2452 MHz	MCS2	16.20	15.54
	6	2437 MHz		/	/
	3	2422 MHz		/	/
	9	2452 MHz	MCS3	16.20	15.72
	6	2437 MHz		/	/
	3	2422 MHz		/	/
	9	2452 MHz	MCS4	16.20	15.25
	6	2437 MHz		/	/
	3	2422 MHz		/	/
	9	2452 MHz	MCS5	15.20	14.77
	6	2437 MHz		/	/
	3	2422 MHz		/	/
	9	2452 MHz	MCS6	15.20	14.62
	6	2437 MHz		/	/
	3	2422 MHz		/	/
	9	2452 MHz	MCS7	15.20	14.58
	6	2437 MHz		/	/
	3	2422 MHz		/	/

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 SAR Measurement Positions

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

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
Main antenna	Yes	Yes	Yes	Yes	No	Yes
WLAN	Yes	Yes	No	Yes	Yes	No

12.4 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	7	5.01	Yes
		Body	19.2	7	5.01	Yes
2.4GHz WLAN 802.11 b	2.45	Head	9.58	19.5	89.13	No
		Body	19.17	19.5	89.13	No

13 Evaluation of Simultaneous

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

	Position	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Left hand, Touch cheek	0.47	1.01	**1.48**
Highest reported SAR value for Body	Rear	1.08	0.28	**1.36**

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	0.47	0.21	**0.68**
Maximum reported SAR value for Body	Front	1.18	0.10	**1.28**

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

Table 13.3: Estimated SAR for Bluetooth

Mode/Band	F (GHz)	Position	Distance (mm)	Upper limit of power *		Estimated$_{1g}$ (W/kg)
				dBm	mW	
Bluetooth	2.441	Head	5	7	5.01	0.21
Bluetooth	2.441	Body	10	7	5.01	0.10

* - 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.
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.

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 10mm 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	1:2
WCDMA&LTE	1:1

14.1 SAR results

Table 14-1 GSM850 #1 Head

GSM850 #1 Head									
Ambient Temperature:			22.5			Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	
GSM	Tune-up		32.50	32.50	32.50	Scaling factor*			
	Slot Average Power [dBm]		31.94	32.01	31.95	1.14	1.12	1.14	
	Left Cheek	1g SAR		0.11			0.12		
		10g SAR		0.086			0.10		
		Deviation		0.08			0.08		
	Left Tilt	1g SAR		0.06			0.07		
		10g SAR		0.048			0.05		
		Deviation		0.14			0.14		
	Right Cheek	1g SAR	0.087	0.14	0.144	0.10	0.16	0.16	
		10g SAR	0.068	0.109	0.112	0.08	0.12	0.13	
		Deviation	0.05	0.01	-0.05	0.05	0.01	-0.05	
	Right Tilt	1g SAR		0.055			0.06		
		10g SAR		0.044			0.05		
		Deviation		0.07			0.07		

Table 14-2 GSM850 #1 Body

GSM850 #1 Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	
GPRS 4 Txslots	Tune-up		28.50	28.50	28.50	Scaling factor*			
	Slot Average Power [dBm]		27.71	27.76	27.65	1.20	1.19	1.22	
	Front	1g SAR		0.195			0.23		
		10g SAR		0.107			0.13		
		Deviation		0.03			0.03		
	Rear	1g SAR	0.246	0.284	0.326	0.30	0.34	0.40	
		10g SAR	0.128	0.154	0.179	0.15	0.18	0.22	
		Deviation	0.13	0.02	0.01	0.13	0.02	0.01	
	Left edge	1g SAR		0.124			0.15		
		10g SAR		0.062			0.07		
		Deviation		0.09			0.09		
	Right edge	1g SAR		0.124			0.15		
		10g SAR		0.08			0.09		
		Deviation		0.07			0.07		
	Bottom edge	1g SAR		0.086			0.10		
		10g SAR		0.036			0.04		
		Deviation		0.1			0.10		
EGPRS GMSK 4 Txslots	Tune-up		28.50	28.50	28.50	Scaling factor*			
	Slot Average Power [dBm]		27.67	27.74	27.65	1.21	1.19	1.22	
	Rear	1g SAR			0.291			0.35	
		10g SAR			0.16			0.19	
		Deviation			0.03			0.03	

Table 14-3 PCS1900 #1 Head

PCS1900 #1 Head									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH810 1909.8	CH661 1880 MHz	CH512 1850.2	CH810 1909.8	CH661 1880 MHz	CH512 1850.2	
GSM	Tune-up		30.30	30.30	30.30	Scaling factor*			
	Slot Average Power [dBm]		29.87	29.63	29.46	1.10	1.17	1.21	
	Left Cheek	1g SAR		0.106			0.12		
		10g SAR		0.07			0.08		
		Deviation		0.06			0.06		
	Left Tilt	1g SAR		0.045			0.05		
		10g SAR		0.031			0.04		
		Deviation		0.03			0.03		
	Right Cheek	1g SAR	0.148	0.116	0.113	0.16	0.14	0.14	
		10g SAR	0.091	0.078	0.075	0.10	0.09	0.09	
		Deviation	0.04	0.01	0.13	0.04	0.01	0.13	
	Right Tilt	1g SAR		0.049			0.06		
		10g SAR		0.032			0.04		
		Deviation		0.06			0.06		

Table 14-4 PCS1900 #1 Body

PCS1900 #1 Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH810 1909.8	CH661 1880 MHz	CH512 1850.2	CH810 1909.8	CH661 1880 MHz	CH512 1850.2	
GPRS 4 Txslots	Tune-up		25.00	25.00	25.00	Scaling factor*			
	Slot Average Power [dBm]		24.73	24.44	24.20	1.06	1.14	1.20	
	Front	1g SAR		0.283			0.32		
		10g SAR		0.161			0.18		
		Deviation		0.09			0.09		
	Rear	1g SAR		0.275			0.31		
		10g SAR		0.16			0.18		
		Deviation		0.02			0.02		
	Left edge	1g SAR		0.113			0.13		
		10g SAR		0.065			0.07		
		Deviation		0.11			0.11		
	Right edge	1g SAR		0.066			0.08		
		10g SAR		0.04			0.05		
		Deviation		-0.04			-0.04		
	Bottom edge	1g SAR	0.38	0.386	0.326	0.40	0.44	0.39	
		10g SAR	0.192	0.192	0.159	0.20	0.22	0.19	
		Deviation	-0.14	0.08	0.05	-0.14	0.08	0.05	
EGPRS GMSK 4 Txslots	Tune-up		25.00	25.00	25.00	Scaling factor*			
	Slot Average Power [dBm]		24.73	24.43	24.20	1.06	1.14	1.20	
	Bottom edge	1g SAR		0.378			0.43		
		10g SAR		0.192			0.22		
		Deviation		-0.12			-0.12		

Table 14-5 WCDMA1900-BII #1Head

WCDMA1900-BII #1Head									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz	CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.60	23.66	23.72	1.10	1.08	1.07	
	Left Cheek	1g SAR		0.2			0.22		
		10g SAR		0.081			0.09		
		Deviation		-0.03			-0.03		
	Left Tilt	1g SAR		0.126			0.14		
		10g SAR		0.081			0.09		
		Deviation		0.04			0.04		
	Right Cheek	1g SAR	0.247	0.283	0.301	0.27	0.31	0.32	
		10g SAR	0.155	0.178	0.189	0.17	0.19	0.20	
		Deviation	0.03	-0.04	-0.02	0.03	-0.04	-0.02	
	Right Tilt	1g SAR		0.134			0.14		
		10g SAR		0.076			0.08		
		Deviation		0.18			0.18		

Table 14-6 WCDMA1900-BII #1Body

WCDMA1900-BII #1Body									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz	CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.60	23.66	23.72	1.10	1.08	1.07	
	Front	1g SAR		0.637			0.69		
		10g SAR		0.388			0.42		
		Deviation		-0.04			-0.04		
	Rear	1g SAR		0.629			0.68		
		10g SAR		0.376			0.41		
		Deviation		0.11			0.11		
	Left edge	1g SAR		0.214			0.23		
		10g SAR		0.131			0.14		
		Deviation		0.11			0.11		
	Right edge	1g SAR		0.169			0.18		
		10g SAR		0.107			0.12		
		Deviation		-0.06			-0.06		
	Bottom edge	1g SAR	0.717	0.794	0.812	0.79	0.86	0.87	
		10g SAR	0.278	0.416	0.418	0.30	0.45	0.45	
		Deviation	0.18	-0.13	0.04	0.18	-0.13	0.04	

Table 14-7 WCDMA1700-BIV #1Head

WCDMA1700-BIV #1Head									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.51	23.39	23.43	1.12	1.15	1.14	
	Left Cheek	1g SAR	0.328	0.36	0.288	0.37	0.41	0.33	
		10g SAR	0.213	0.233	0.191	0.24	0.27	0.22	
		Deviation	0.03	-0.1	0.05	0.03	-0.10	0.05	
	Left Tilt	1g SAR		0.151			0.17		
		10g SAR		0.091			0.10		
		Deviation		0.04			0.04		
	Right Cheek	1g SAR		0.254			0.29		
		10g SAR		0.167			0.19		
		Deviation		0.09			0.09		
	Right Tilt	1g SAR		0.21			0.24		
		10g SAR		0.133			0.15		
		Deviation		0.06			0.06		

Table 14-8 WCDMA1700-BIV #1Body

WCDMA1700-BIV #1Body									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.51	23.39	23.43	1.12	1.15	1.14	
	Front	1g SAR	1.05	1.02	1	1.18	1.17	1.14	
		10g SAR	0.64	0.626	0.623	0.72	0.72	0.71	
		Deviation	-0.17	-0.01	-0.11	-0.17	-0.01	-0.11	
	Rear	1g SAR	0.956	0.938	0.911	1.07	1.08	1.04	
		10g SAR	0.572	0.559	0.556	0.64	0.64	0.63	
		Deviation	-0.13	-0.11	0	-0.13	-0.11	0.00	
	Left edge	1g SAR		0.36			0.41		
		10g SAR		0.21			0.24		
		Deviation		-0.01			-0.01		
	Right edge	1g SAR		0.143			0.16		
		10g SAR		0.095			0.11		
		Deviation		0.09			0.09		
	Bottom edge	1g SAR	0.989	0.97	0.942	1.11	1.12	1.07	
		10g SAR	0.531	0.519	0.517	0.59	0.60	0.59	
		Deviation	0.05	0.03	-0.19	0.05	0.03	-0.19	

Table 14-9 WCDMA850-BV #1Head

WCDMA850-BV #1Head									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz	CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.45	23.51	23.44	1.14	1.12	1.14	
	Left Cheek	1g SAR		0.231			0.26		
		10g SAR		0.186			0.21		
		Deviation		0.06			0.06		
	Left Tilt	1g SAR		0.108			0.12		
		10g SAR		0.086			0.10		
		Deviation		-0.08			-0.08		
	Right Cheek	1g SAR	0.28	0.252	0.2	0.32	0.28	0.23	
		10g SAR	0.216	0.192	0.155	0.25	0.21	0.18	
		Deviation	-0.1	0.09	-0.11	-0.10	0.09	-0.11	
	Right Tilt	1g SAR		0.134			0.15		
		10g SAR		0.107			0.12		
		Deviation		0.13			0.13		

Table 14-10 WCDMA850-BV #1Body

WCDMA850-BV #1Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz	CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.45	23.51	23.44	1.14	1.12	1.14	
	Front	1g SAR		0.213			0.24		
		10g SAR		0.17			0.19		
		Deviation		-0.09			-0.09		
	Rear	1g SAR	0.269	0.259	0.242	0.31	0.29	0.28	
		10g SAR	0.213	0.206	0.19	0.24	0.23	0.22	
		Deviation	0.02	0.04	-0.04	0.02	0.04	-0.04	
	Left edge	1g SAR		0.129			0.14		
		10g SAR		0.092			0.10		
		Deviation		0.08			0.08		
	Right edge	1g SAR		0.152			0.17		
		10g SAR		0.109			0.12		
		Deviation		-0.03			-0.03		
	Bottom edge	1g SAR		0.096			0.11		
		10g SAR		0.059			0.07		
		Deviation		0.03			0.03		

Table 14-11 LTE1900-FDD2 #1 Head

LTE1900-FDD2 #1 Head									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			19100 M	18900 M	18700 M	19100 M	18900 M	18700 M	
20MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.82	23.86	23.88	1.17	1.16	1.15	
	Left Cheek	1g SAR			0.169			0.20	
		10g SAR			0.109			0.13	
		Deviation			0.04			0.04	
	Left Tilt	1g SAR			0.086			0.10	
		10g SAR			0.056			0.06	
		Deviation			-0.03			-0.03	
	Right Cheek	1g SAR			0.298			0.34	
		10g SAR			0.186			0.21	
		Deviation			0.07			0.07	
	Right Tilt	1g SAR			0.067			0.08	
		10g SAR			0.044			0.05	
		Deviation			0.02			0.02	
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			19100 L	18900 L	18700 H	19100 L	18900 L	18700 H	
20MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.72	22.88	22.80	1.20	1.15	1.17	
	Left Cheek	1g SAR		0.143			0.16		
		10g SAR		0.092			0.11		
		Deviation		-0.01			-0.01		
	Left Tilt	1g SAR		0.055			0.06		
		10g SAR		0.036			0.04		
		Deviation		0.09			0.09		
	Right Cheek	1g SAR		0.231			0.27		
		10g SAR		0.133			0.15		
		Deviation		0.12			0.12		
	Right Tilt	1g SAR		0.068			0.08		
		10g SAR		0.046			0.05		
		Deviation		0.05			0.05		

Table 14-12 LTE1900-FDD2 #1 Body

LTE1900-FDD2 #1 Body									
Ambient Temperature: 22.5						Liquid Temperature: 22.3			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			19100	18900	18700	19100	18900	18700	
			M	M	M	M	M	M	
20MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.82	23.86	23.88	1.17	1.16	1.15	
	Front	1g SAR			0.578			0.67	
		10g SAR			0.333			0.38	
		Deviation			0.11			0.11	
	Rear	1g SAR			0.557			0.64	
		10g SAR			0.318			0.37	
		Deviation			0.04			0.04	
	Left edge	1g SAR			0.179			0.21	
		10g SAR			0.104			0.12	
		Deviation			-0.04			-0.04	
	Right edge	1g SAR			0.114			0.13	
		10g SAR			0.07			0.08	
		Deviation			0.01			0.01	
	Bottom edge	1g SAR			0.638			0.74	
		10g SAR			0.319			0.37	
		Deviation			-0.06			-0.06	
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			19100	18900	18700	19100	18900	18700	
			L	L	H				
20MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.72	22.88	22.80	1.20	1.15	1.17	
	Front	1g SAR		0.476			0.55		
		10g SAR		0.267			0.31		
		Deviation		-0.19			-0.19		
	Rear	1g SAR		0.459			0.53		
		10g SAR		0.264			0.30		
		Deviation		-0.17			-0.17		
	Left edge	1g SAR		0.155			0.18		
		10g SAR		0.087			0.10		
		Deviation		0.04			0.04		
	Right edge	1g SAR		0.111			0.13		
		10g SAR		0.066			0.08		
		Deviation		0.12			0.12		
	Bottom edge	1g SAR		0.507			0.58		
		10g SAR		0.256			0.30		
		Deviation		0.17			0.17		

Table 14-13 LTE850-FDD5 #1 Head

LTE850-FDD5 #1 Head									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			20600	20525	20450	20600	20525	20450	
			M	M	M	M	M	M	
10MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.81	23.81	23.84	1.17	1.17	1.16	
	Left Cheek	1g SAR			0.221			0.26	
		10g SAR			0.154			0.18	
		Deviation			-0.08			-0.08	
	Left Tilt	1g SAR			0.143			0.17	
		10g SAR			0.116			0.14	
		Deviation			0.03			0.03	
	Right Cheek	1g SAR			0.263			0.31	
		10g SAR			0.204			0.24	
		Deviation			0.19			0.19	
	Right Tilt	1g SAR			0.154			0.18	
		10g SAR			0.123			0.14	
		Deviation			0.16			0.16	
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			20600	20525	20450	20600	20525	20450	
			H	M	M	H	M	M	
10MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.79	22.79	22.74	1.18	1.18	1.19	
	Left Cheek	1g SAR	0.186			0.22			
		10g SAR	0.147			0.17			
		Deviation	-0.08			-0.08			
	Left Tilt	1g SAR	0.114			0.13			
		10g SAR	0.09			0.11			
		Deviation	0.03			0.03			
	Right Cheek	1g SAR	0.239			0.28			
		10g SAR	0.185			0.22			
		Deviation	-0.03			-0.03			
	Right Tilt	1g SAR	0.136			0.16			
		10g SAR	0.109			0.13			
		Deviation	0.19			0.19			

Table 14-14 LTE850-FDD5 #1 Body

LTE850-FDD5 #1 Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			20600	20525	20450	20600	20525	20450	
			M	M	M	M	M	M	
10MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.81	23.81	23.84	1.17	1.17	1.16	
	Front	1g SAR			0.241			0.28	
		10g SAR			0.192			0.22	
		Deviation			-0.03			-0.03	
	Rear	1g SAR			0.304			0.35	
		10g SAR			0.241			0.28	
		Deviation			0.04			0.04	
	Left edge	1g SAR			0.141			0.16	
		10g SAR			0.101			0.12	
		Deviation			0.02			0.02	
	Right edge	1g SAR			0.227			0.26	
		10g SAR			0.166			0.19	
		Deviation			-0.08			-0.08	
	Bottom edge	1g SAR			0.097			0.11	
		10g SAR			0.057			0.07	
		Deviation			0.08			0.08	
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			20600	20525	20450	20600	20525	20450	
			H	M	M				
10MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.79	22.79	22.74	1.18	1.18	1.19	
	Front	1g SAR	0.199			0.23			
		10g SAR	0.157			0.18			
		Deviation	-0.08			-0.08			
	Rear	1g SAR	0.239			0.28			
		10g SAR	0.189			0.22			
		Deviation	0.01			0.01			
	Left edge	1g SAR	0.114			0.13			
		10g SAR	0.081			0.10			
		Deviation	-0.03			-0.03			
	Right edge	1g SAR	0.125			0.15			
		10g SAR	0.091			0.11			
		Deviation	0.05			0.05			
	Bottom edge	1g SAR	0.11			0.13			
		10g SAR	0.065			0.08			
		Deviation	0.08			0.08			

Table 14-15 LTE700-FDD12 #1 Head

LTE700-FDD12 #1 Head									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			23130	23095	23060	23130	23095	23060	
			M	M	M	M	M	M	
10MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.83	23.89	23.97	1.17	1.15	1.13	
	Left Cheek	1g SAR			0.155			0.18	
		10g SAR			0.125			0.14	
		Deviation			0.12			0.12	
	Left Tilt	1g SAR			0.074			0.08	
		10g SAR			0.05			0.06	
		Deviation			-0.02			-0.02	
	Right Cheek	1g SAR			0.296			0.33	
		10g SAR			0.239			0.27	
		Deviation			-0.07			-0.07	
	Right Tilt	1g SAR			0.106			0.12	
		10g SAR			0.088			0.10	
		Deviation			0.11			0.11	
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			23130	23095	23060	23130	23095	23060	
			M	H	L	M	H	L	
10MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.80	22.96	22.86	1.18	1.13	1.16	
	Left Cheek	1g SAR		0.135			0.15		
		10g SAR		0.11			0.12		
		Deviation		0.14			0.14		
	Left Tilt	1g SAR		0.088			0.10		
		10g SAR		0.068			0.08		
		Deviation		-0.08			-0.08		
	Right Cheek	1g SAR		0.24			0.27		
		10g SAR		0.195			0.22		
		Deviation		-0.19			-0.19		
	Right Tilt	1g SAR		0.134			0.15		
		10g SAR		0.11			0.12		
		Deviation		0.11			0.11		

Table 14-16 LTE700-FDD12 #1 Body

LTE700-FDD12 #1 Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			23130	23095	23060	23130	23095	23060	
			M	M	M	M	M	M	
10MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.83	23.89	23.97	1.17	1.15	1.13	
	Front	1g SAR			0.269			0.30	
		10g SAR			0.215			0.24	
		Deviation			0.02			0.02	
	Rear	1g SAR			0.354			0.40	
		10g SAR			0.279			0.32	
		Deviation			-0.01			-0.01	
	Left edge	1g SAR			0.236			0.27	
		10g SAR			0.172			0.19	
		Deviation			0.08			0.08	
	Right edge	1g SAR			0.095			0.11	
		10g SAR			0.072			0.08	
		Deviation			0.14			0.14	
	Bottom edge	1g SAR			0.074			0.08	
		10g SAR			0.047			0.05	
		Deviation			0.11			0.11	
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			23130	23095	23060	23130	23095	23060	
			M	H	L				
10MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.80	22.96	22.86	1.18	1.13	1.16	
	Front	1g SAR		0.209			0.24		
		10g SAR		0.169			0.19		
		Deviation		0.06			0.06		
	Rear	1g SAR		0.28			0.32		
		10g SAR		0.224			0.25		
		Deviation		0.09			0.09		
	Left edge	1g SAR		0.151			0.17		
		10g SAR		0.11			0.12		
		Deviation		0.05			0.05		
	Right edge	1g SAR		0.117			0.13		
		10g SAR		0.088			0.10		
		Deviation		0.04			0.04		
	Bottom edge	1g SAR		0.077			0.09		
		10g SAR		0.048			0.05		
		Deviation		-0.13			-0.13		

Table 14-17 LTE1700-FDD66 #1 Head

LTE1700-FDD66 #1 Head								
Ambient Temperature:	22.5					Liquid Temperature:		22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			132572	132322	132072	132572	132322	132072
			M	M	M	M	M	M
20MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*		
	Measured Power [dBm]		23.55	23.49	23.52	1.11	1.12	1.12
	Left Cheek	1g SAR	0.425			0.47		
		10g SAR	0.274			0.30		
		Deviation	0.09			0.09		
	Left Tilt	1g SAR	0.167			0.19		
		10g SAR	0.1			0.11		
		Deviation	-0.03			-0.03		
	Right Cheek	1g SAR	0.245			0.27		
		10g SAR	0.17			0.19		
		Deviation	0.09			0.09		
	Right Tilt	1g SAR	0.106			0.12		
		10g SAR	0.069			0.08		
		Deviation	0.18			0.18		
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			132572	132322	132072	132572	132322	132072
			L	H	M	L	H	M
20MHz QPSK50% RB	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Measured Power [dBm]		22.46	22.34	22.36	1.13	1.16	1.16
	Left Cheek	1g SAR	0.205			0.23		
		10g SAR	0.133			0.15		
		Deviation	0.09			0.09		
	Left Tilt	1g SAR	0.087			0.10		
		10g SAR	0.053			0.06		
		Deviation	0.01			0.01		
	Right Cheek	1g SAR	0.194			0.22		
		10g SAR	0.13			0.15		
		Deviation	-0.02			-0.02		
	Right Tilt	1g SAR	0.088			0.10		
		10g SAR	0.058			0.07		
		Deviation	0.06			0.06		

Table 14-18 LTE1700-FDD66 #1 Body

LTE1700-FDD66 #1 Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			132572	132322	132072	132572	132322	132072	
			M	M	M	M	M	M	
20MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Measured Power [dBm]		23.55	23.49	23.52	1.11	1.12	1.12	
	Front	1g SAR	0.747	0.767	0.75	0.83	0.86	0.84	
		10g SAR	0.476	0.482	0.474	0.53	0.54	0.53	
		Deviation	0.14	-0.03	0.19	0.14	-0.03	0.19	
	Rear	1g SAR	0.699			0.77			
		10g SAR	0.428			0.47			
		Deviation	0.14			0.14			
	Left edge	1g SAR	0.309			0.34			
		10g SAR	0.195			0.22			
		Deviation	0.17			0.17			
	Right edge	1g SAR	0.115			0.13			
		10g SAR	0.077			0.09			
		Deviation	0.09			0.09			
	Bottom edge	1g SAR	0.796	0.763	0.755	0.88	0.86	0.84	
		10g SAR	0.44	0.43	0.429	0.49	0.48	0.48	
		Deviation	0.04	0.11	0.09	0.04	0.11	0.09	
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			132572	132322	132072	132572	132322	132072	
			L	H	M				
20MHz QPSK50% RB	Tune-up		23.00	23.00	23.00	Scaling factor*			
	Measured Power [dBm]		22.46	22.34	22.36	1.13	1.16	1.16	
	Front	1g SAR	0.609			0.69			
		10g SAR	0.388			0.44			
		Deviation	0.08			0.08			
	Rear	1g SAR	0.571			0.65			
		10g SAR	0.35			0.40			
		Deviation	0.07			0.07			
	Left edge	1g SAR	0.233			0.26			
		10g SAR	0.145			0.16			
		Deviation	-0.02			-0.02			
	Right edge	1g SAR	0.095			0.11			
		10g SAR	0.077			0.09			
		Deviation	0.02			0.02			
	Bottom edge	1g SAR	0.645			0.73			
		10g SAR	0.355			0.40			
		Deviation	0.02			0.02			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			132572	132322	132072	132572	132322	132072	
20MHz QPSK100% RB	Tune-up		23.00	23.00	23.00	Scaling factor*			
	Measured Power [dBm]		22.43	22.36	22.32	1.14	1.16	1.17	
	Front	1g SAR	0.569			0.65			
		10g SAR	0.357			0.41			
		Deviation	0.01			0.01			
20MHz QPSK100% RB	*Bottom edge*	1g SAR	0.613			0.68			
		10g SAR	0.371			0.41			
		Deviation	0.05			0.05			

Table 14-19 LTE700-FDD71 #1 Head

LTE700-FDD71 #1 Head									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			133372	133297	133222	133372	133297	133222	
			M	M	M	M	M	M	
20MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Measured Power [dBm]		23.51	23.53	23.60	1.12	1.11	1.10	
	Left Cheek	1g SAR			0.155			0.17	
		10g SAR			0.122			0.13	
		Deviation			-0.02			-0.02	
	Left Tilt	1g SAR			0.143			0.16	
		10g SAR			0.094			0.10	
		Deviation			-0.01			-0.01	
	Right Cheek	1g SAR			0.174			0.19	
		10g SAR			0.143			0.16	
		Deviation			-0.12			-0.12	
	Right Tilt	1g SAR			0.067			0.07	
		10g SAR			0.055			0.06	
		Deviation			0.15			0.15	
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			133372	133297	133222	133372	133297	133222	
			H	H	H	H	H	H	
20MHz QPSK50% RB	Tune-up		23.00	23.00	23.00	Scaling factor*			
	Measured Power [dBm]		22.51	22.54	22.57	1.12	1.11	1.10	
	Left Cheek	1g SAR			0.115			0.13	
		10g SAR			0.093			0.10	
		Deviation			0.12			0.12	
	Left Tilt	1g SAR			0.096			0.11	
		10g SAR			0.066			0.07	
		Deviation			0.01			0.01	
	Right Cheek	1g SAR			0.118			0.13	
		10g SAR			0.097			0.11	
		Deviation			-0.1			-0.10	
	Right Tilt	1g SAR			0.024			0.03	
		10g SAR			0.021			0.02	
		Deviation			0.06			0.06	

Table 14-20 LTE700-FDD71 #1 Body

LTE700-FDD71 #1 Body									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			133372	133297	133222	133372	133297	133222	
			M	M	M	M	M	M	
20MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Measured Power [dBm]		23.51	23.53	23.60	1.12	1.11	1.10	
	Front	1g SAR			0.183			0.20	
		10g SAR			0.111			0.12	
		Deviation			-0.17			-0.17	
	Rear	1g SAR			0.279			0.31	
		10g SAR			0.16			0.18	
		Deviation			-0.01			-0.01	
	Left edge	1g SAR			0.166			0.18	
		10g SAR			0.091			0.10	
		Deviation			0.14			0.14	
	Right edge	1g SAR			0.194			0.21	
		10g SAR			0.11			0.12	
		Deviation			0.1			0.10	
	Bottom edge	1g SAR			0.098			0.11	
		10g SAR			0.045			0.05	
		Deviation			0.08			0.08	
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			133372	133297	133222	133372	133297	133222	
			H	H	H				
20MHz QPSK50% RB	Tune-up		23.00	23.00	23.00	Scaling factor*			
	Measured Power [dBm]		22.51	22.54	22.57	1.12	1.11	1.10	
	Front	1g SAR			0.126			0.14	
		10g SAR			0.076			0.08	
		Deviation			-0.01			-0.01	
	Rear	1g SAR			0.194			0.21	
		10g SAR			0.111			0.12	
		Deviation			0.15			0.15	
	Left edge	1g SAR			0.11			0.12	
		10g SAR			0.061			0.07	
		Deviation			0.03			0.03	
	Right edge	1g SAR			0.136			0.15	
		10g SAR			0.077			0.09	
		Deviation			0.07			0.07	
	Bottom edge	1g SAR			0.07			0.08	
		10g SAR			0.033			0.04	
		Deviation			0.11			0.11	

14.2 Full SAR

Test Band	Channel	Frequency	Tune-Up	Measured Power	Test Position	Measured 10g SAR	Measured 1g SAR	Reported 10g SAR	Reported 1g SAR	Power Drift	Figure
GSM850	128	824.2 MHz	32.5	31.95	Right Cheek	0.112	0.144	0.13	0.16	-0.05	Fig A.1
GSM850	128	824.2 MHz	28.5	27.65	Rear	0.179	0.326	0.22	0.40	0.01	Fig A.2
PCS1900	810	1909.8 MHz	30.3	29.87	Right Cheek	0.091	0.148	0.10	0.16	0.04	Fig A.3
PCS1900	661	1880 MHz	25	24.44	Bottom edge	0.192	0.386	0.22	0.44	0.08	Fig A.4
WCDMA1900-BII	9262	1852.4 MHz	24	23.72	Right Cheek	0.189	0.301	0.20	0.32	-0.02	Fig A.5
WCDMA1900-BII	9262	1852.4 MHz	24	23.72	Bottom edge	0.418	0.812	0.45	0.87	0.04	Fig A.6
WCDMA1700-BIV	1412	1732.4 MHz	24	23.39	Left Cheek	0.233	0.36	0.27	0.41	-0.1	Fig A.7
WCDMA1700-BIV	1513	1752.6 MHz	24	23.51	Front	0.64	1.05	0.72	1.18	-0.17	Fig A.8
WCDMA850-BV	4233	846.6 MHz	24	23.45	Right Cheek	0.216	0.28	0.25	0.32	-0.1	Fig A.9
WCDMA850-BV	4233	846.6 MHz	24	23.45	Rear	0.213	0.269	0.24	0.31	0.02	Fig A.10
LTE1900-FDD2	18700	1860 MHz	24.5	23.88	Right Cheek	0.186	0.298	0.21	0.34	0.07	Fig A.11
LTE1900-FDD2	18700	1860 MHz	24.5	23.88	Bottom edge	0.319	0.638	0.37	0.74	-0.06	Fig A.12
LTE850-FDD5	20450	829 MHz	24.5	23.84	Right Cheek	0.204	0.263	0.24	0.31	0.19	Fig A.13
LTE850-FDD5	20450	829 MHz	24.5	23.84	Rear	0.241	0.304	0.28	0.35	0.04	Fig A.14
LTE700-FDD12	23060	704 MHz	24.5	23.97	Right Cheek	0.239	0.296	0.27	0.33	-0.07	Fig A.15
LTE700-FDD12	23060	704 MHz	24.5	23.97	Rear	0.279	0.354	0.32	0.40	-0.01	Fig A.16
LTE1700-FDD66	132572	704 MHz	24	23.55	Left Cheek	0.274	0.425	0.30	0.47	0.09	Fig A.17
LTE1700-FDD66	132572	704 MHz	24	23.55	Bottom edge	0.44	0.796	0.49	0.88	0.04	Fig A.18
LTE700-FDD71	133222	704 MHz	24	23.60	Right Cheek	0.143	0.174	0.16	0.19	-0.12	Fig A.19
LTE700-FDD71	133222	704 MHz	24	23.60	Rear	0.16	0.279	0.18	0.31	-0.01	Fig A.20

14.3 WLAN Evaluation

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

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.

Note3: 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.

Table 14-21 WLAN2450 #1 Head Fast SAR

WLAN2450 #1 Head Fast SAR									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			11	6	1	11	6	1	
			2462 MHz	2437 MHz	2412 MHz				
802.11b 5.5Mbps	Tune up		19.5	19.5	19.5	Scaling factor*			
	Slot Average Power [dBm]		18.78	18.60	18.48	1.18	1.23	1.26	
	Left Cheek	1g Fast SAR	0.748			0.88			
		10g SAR	0.372			0.44			
		Deviation	0.03			0.03			
	Left Tilt	1g Fast SAR	0.767			0.91			
		10g SAR	0.36			0.42			
		Deviation	0.12			0.12			
	Right Cheek	1g Fast SAR	0.429			0.51			
		10g SAR	0.203			0.24			
		Deviation	0.09			0.09			
	Right Tilt	1g Fast SAR	0.407			0.48			
		10g SAR	0.194			0.23			
		Deviation	0.04			0.04			

Table 14-22 WLAN2450 #1 Head Full SAR

WLAN2450 #1 Head Full SAR									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			11	6	1	11	6	1	
			2462 MHz	2437 MHz	2412 MHz				
802.11b 5.5Mbps	Tune up		19.5	19.5	19.5	Scaling factor*			
	Slot Average Power [dBm]		18.78	18.60	18.48	1.18	1.23	1.26	
	Left Cheek	1g Full SAR	0.852	0.814		1.01	1.00		
		10g SAR	0.394	0.376		0.47	0.46		
		Deviation	0.03	0.01		0.03	0.01		
	Left Tilt	1g Full SAR	0.783	0.463		0.92	0.57		
		10g SAR	0.343	0.223		0.40	0.27		
		Deviation	0.12	-0.04		0.12	-0.04		
	Right Cheek	1g Full SAR	0.421			0.50			
		10g SAR	0.194			0.23			
		Deviation	0.09			0.09			

Table 14-23 WLAN2450 #1 Body Fast SAR

WLAN2450 #1 Body Fast SAR									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			11	6	1	11	6	1	
			2462 MHz	2437 MHz	2412 MHz				
802.11b 5.5Mbps	Tune up		19.5	19.5	19.5	Scaling factor*			
	Slot Average Power [dBm]		18.78	18.60	18.48	1.18	1.23	1.26	
	Front	1g Fast SAR	0.148			0.17			
		10g SAR	0.083			0.10			
		Deviation	0.08			0.08			
	Rear	1g Fast SAR	0.234			0.28			
		10g SAR	0.109			0.13			
		Deviation	0.03			0.03			
	Top edge	1g Fast SAR	0.134			0.16			
		10g SAR	0.071			0.08			
		Deviation	0.04			0.04			
	Right edge	1g Fast SAR	0.151			0.18			
		10g SAR	0.079			0.09			
		Deviation	0.01			0.01			

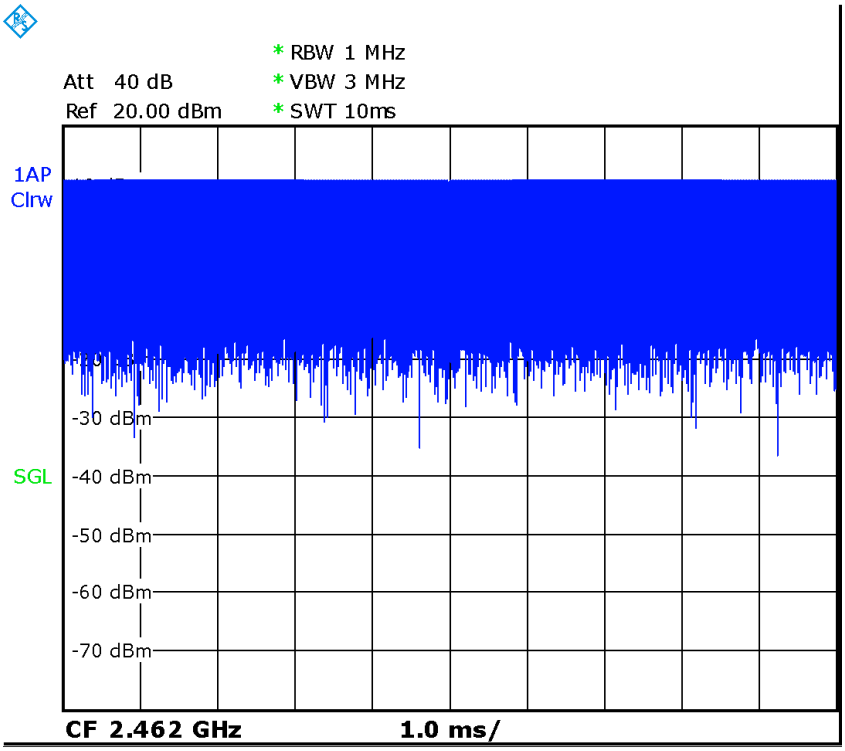
Table 14-24 WLAN2450 #1 Body Full SAR

WLAN2450 #1 Body Full SAR									
Ambient Temperature:	22.5					Liquid Temperature:	22.3		
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			11	6	1	11	6	1	
			2462 MHz	2437 MHz	2412 MHz				
802.11b 5.5Mbps	Tune up		19.5	19.5	19.5	Scaling factor*			
	Slot Average Power [dBm]		18.78	18.60	18.48	1.18	1.23	1.26	
	Rear	1g Full SAR	0.236			0.28			
		10g SAR	0.111			0.13			
		Deviation	0.03			0.03			

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							
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR(1g)(W/kg)	Scaled reported SAR(1g)(W/kg)	Figure
MHz	Ch.						
2462 MHz	11	Left Cheek	100.00%	100%	**1.01**	**1.01**	Fig.21

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							
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR(1g)(W/kg)	Scaled reported SAR(1g)(W/kg)	Figure
MHz	Ch.						
2462 MHz	11	Rear	100.00%	100%	**0.28**	**0.28**	Fig.22

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



Picture 14.1 Duty factor plot

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.

Mode	CH	Freq	Test Poisition	Original SAR (W/kg)	First Repeated SAR(W/kg)	The Ratio
WCDMA1900-BII	9262	1852.4 MHz	Bottom edge	0.812	0.809	1.00
WCDMA1700-BIV	1513	1752.6 MHz	Front	1.05	1.04	1.01
WLAN2450	11	2462 MHz	Left Cheek	0.852	0.847	1.01

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

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 24, 2018	One year
02	Power meter	NRVD	102083	November 01,2017	One year
03	Power sensor	NRV-Z5	100542		
04	Signal Generator	E4438C	MY49070393	January 02,2018	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	159889	December 20, 2017	One year
07	E-field Probe	SPEAG EX3DV4	7464	September 12,2017	One year
08	DAE	SPEAG DAE4	1525	October 02, 2017	One year
09	Dipole Validation Kit	SPEAG D750V3	1017	July 19,2017	One year
10	Dipole Validation Kit	SPEAG D835V2	4d069	July 19,2017	One year
11	Dipole Validation Kit	SPEAG D1750V2	1003	July 21,2017	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d101	July 26,2017	One year
13	Dipole Validation Kit	SPEAG D2450V2	853	July 21,2017	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH128 Right Cheek
Date: 7/6/2018
Electronics: DAE4 Sn1525
Medium: head 835 MHz
Medium parameters used: f = 824.2 MHz; σ = 0.888 mho/m; εr = 40.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: GSM850 824.2 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7464 ConvF(10.28,10.28,10.28)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.158 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.881 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.176 W/kg
SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.112 W/kg
Maximum value of SAR (measured) = 0.156 W/kg

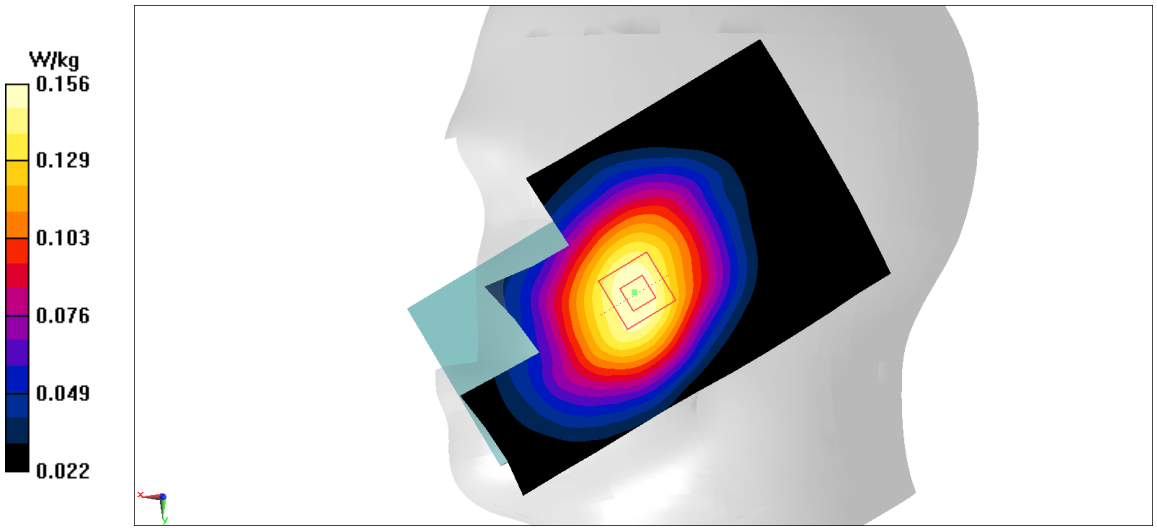


Fig A.1

GSM850_CH128 Rear
Date: 7/6/2018
Electronics: DAE4 Sn1525
Medium: body 835 MHz
Medium parameters used: f = 824.2 MHz; σ = 0.954 mho/m; εr = 55.66; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: GSM850 824.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN7464 ConvF(10.21,10.21,10.21)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.404 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.71 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.603 W/kg
SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.179 W/kg
Maximum value of SAR (measured) = 0.389 W/kg

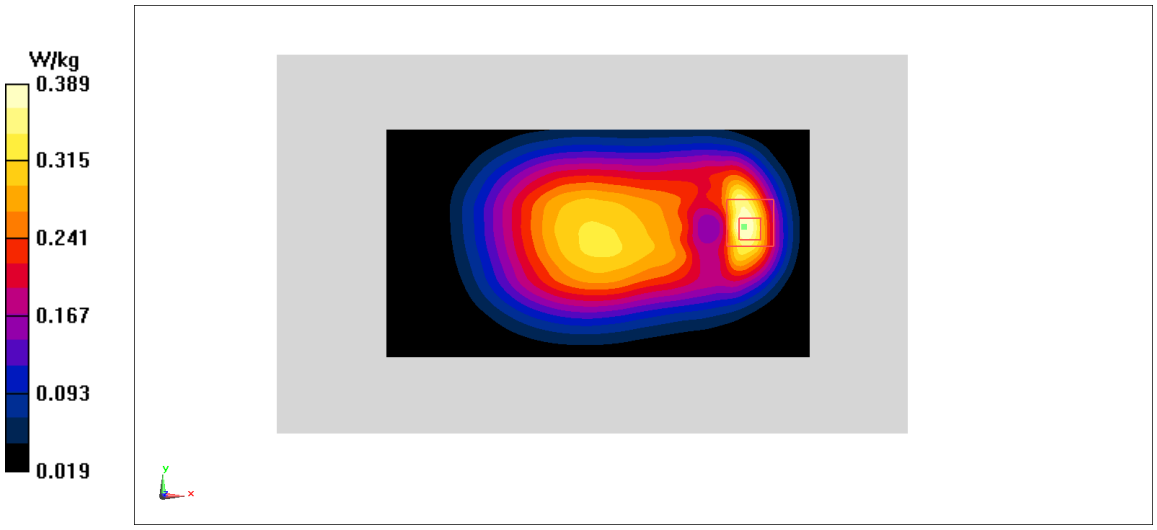


Fig A.2

PCS1900_CH810 Right Cheek
Date: 7/8/2018
Electronics: DAE4 Sn1525
Medium: head 1900 MHz
Medium parameters used: f = 1909.8 MHz; σ = 1.418 mho/m; εr = 40.73; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: PCS1900 1909.8 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7464 ConvF(8.39,8.39,8.39)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.174 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.433 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.23 W/kg
SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.091 W/kg
Maximum value of SAR (measured) = 0.177 W/kg

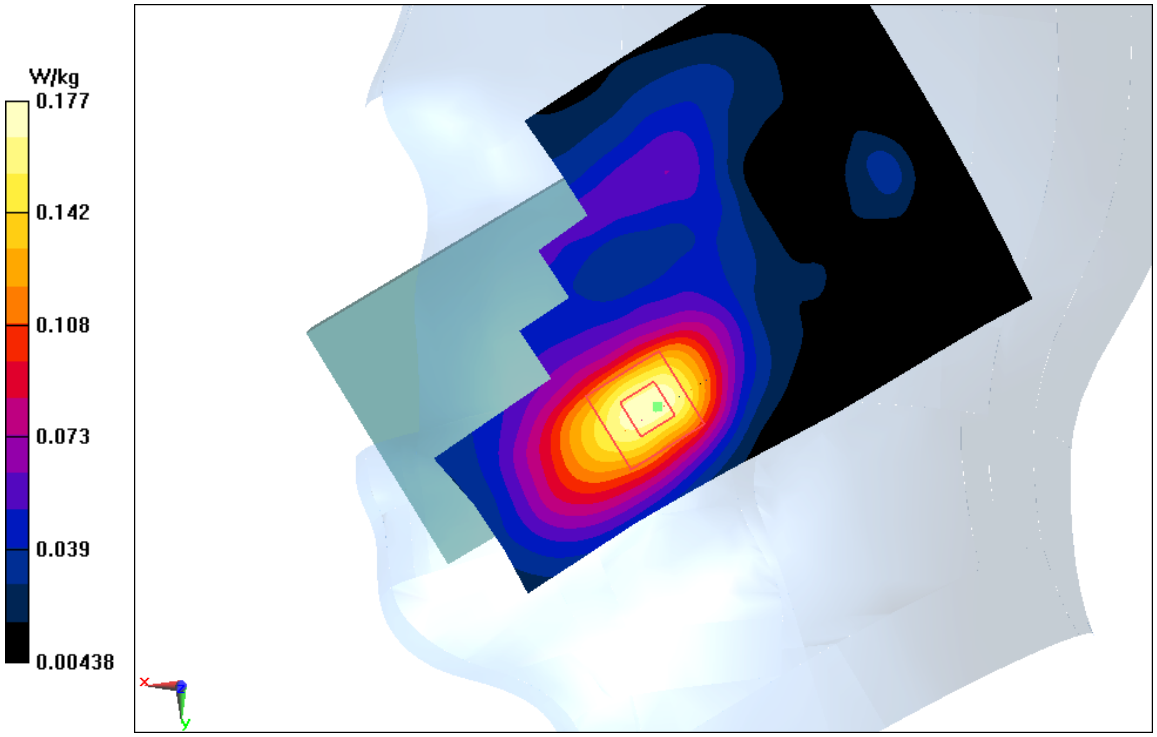


Fig A.3

PCS1900_CH661 Bottom edge
Date: 7/8/2018
Electronics: DAE4 Sn1525
Medium: body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.496 mho/m; εr = 52.5; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: PCS1900 1880 MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN7464 ConvF(8.32,8.32,8.32)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.459 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.522 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.714 W/kg
SAR(1 g) = 0.386 W/kg; SAR(10 g) = 0.192 W/kg
Maximum value of SAR (measured) = 0.506 W/kg

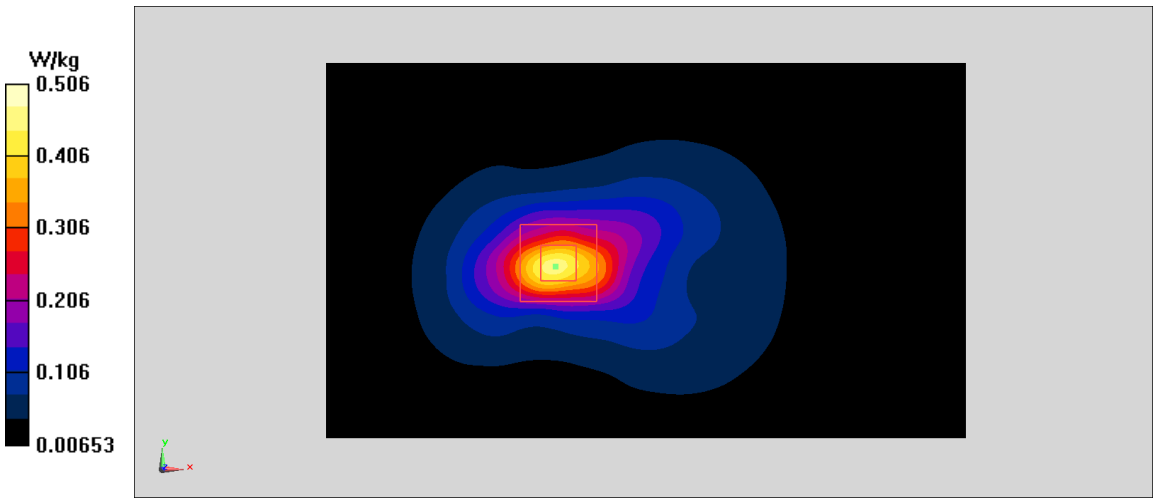


Fig A.4

WCDMA1900-BII_CH9262 Right Cheek
Date: 7/8/2018
Electronics: DAE4 Sn1525
Medium: head 1900 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.362 mho/m; εr = 40.8; 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 – SN7464 ConvF(8.39,8.39,8.39)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.365 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.479 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.457 W/kg
SAR(1 g) = 0.301 W/kg; SAR(10 g) = 0.189 W/kg
Maximum value of SAR (measured) = 0.342 W/kg

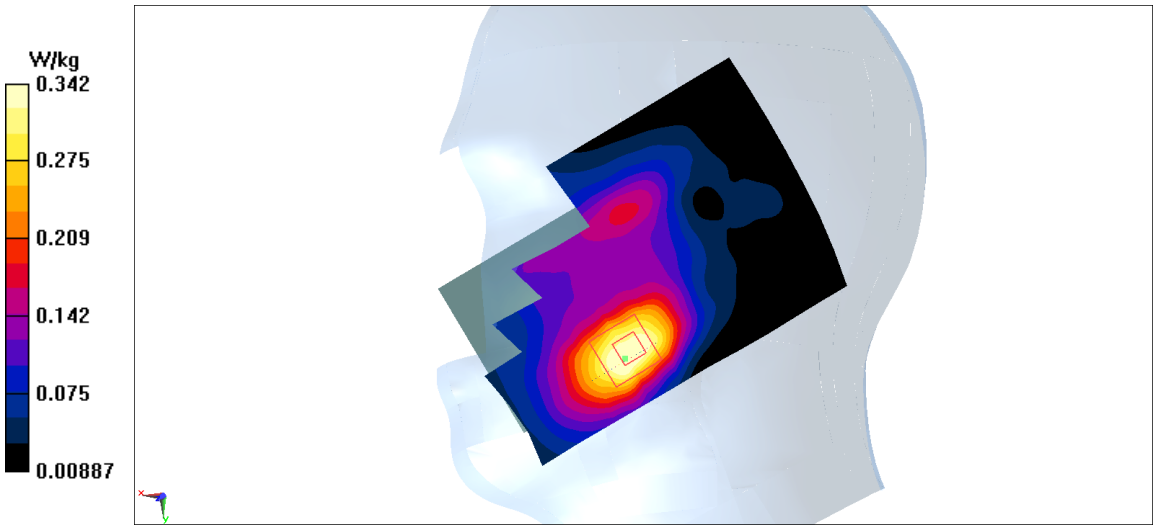


Fig A.5

WCDMA1900-BII_CH9262 Bottom edge
Date: 7/8/2018
Electronics: DAE4 Sn1525
Medium: body 1900 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.469 mho/m; εr = 52.54; 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 – SN7464 ConvF(8.32,8.32,8.32)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.991 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.35 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.812 W/kg; SAR(10 g) = 0.418 W/kg
Maximum value of SAR (measured) = 1.03 W/kg

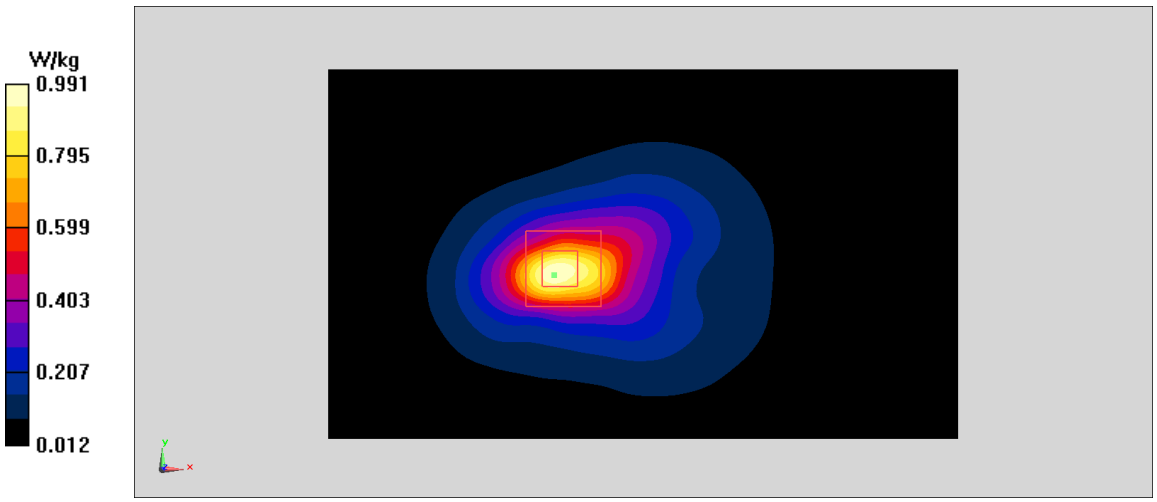


Fig A.6

WCDMA1700-BIV_CH1412 Left Cheek
Date: 7/7/2018
Electronics: DAE4 Sn1525
Medium: head 1750 MHz
Medium parameters used: f = 1732.4 MHz; σ = 1.341 mho/m; εr = 39.71; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7464 ConvF(8.70,8.70,8.70)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.404 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.418 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 0.535 W/kg
SAR(1 g) = 0.36 W/kg; SAR(10 g) = 0.233 W/kg
Maximum value of SAR (measured) = 0.423 W/kg

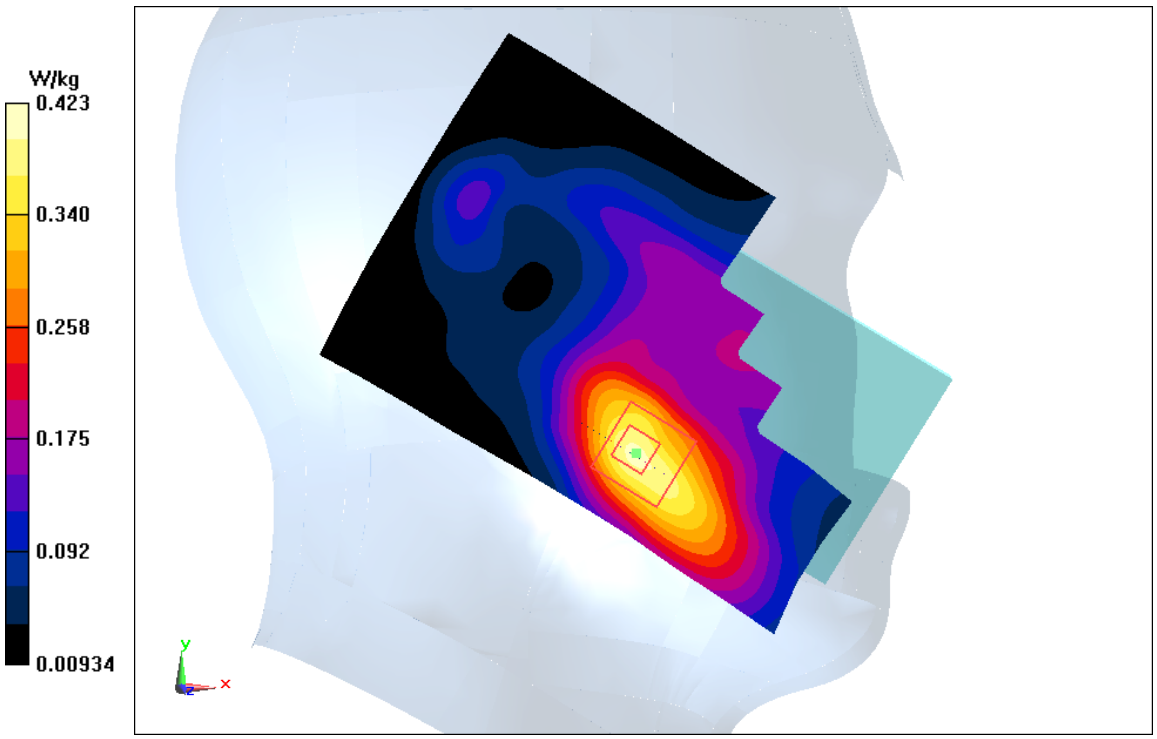


Fig A.7

WCDMA1700-BIV_CH1513 Front
Date: 7/7/2018
Electronics: DAE4 Sn1525
Medium: body 1750 MHz
Medium parameters used: f = 1752.6 MHz; σ = 1.503 mho/m; εr = 52.52; 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 – SN7464 ConvF(8.60,8.60,8.60)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.27 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.96 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.64 W/kg
Maximum value of SAR (measured) = 1.19 W/kg

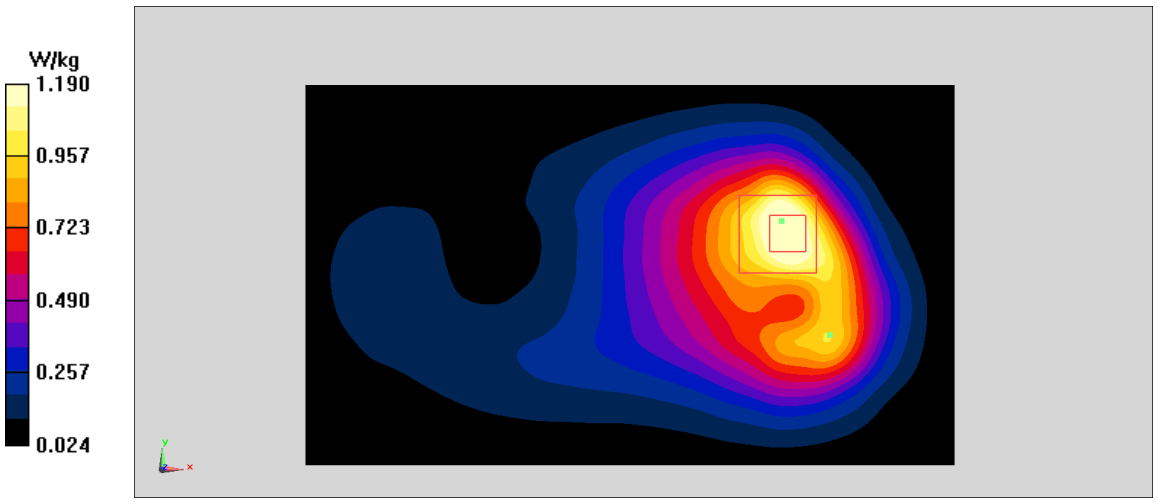


Fig A.8

WCDMA850-BV_CH4233 Right Cheek
Date: 7/6/2018
Electronics: DAE4 Sn1525
Medium: head 835 MHz
Medium parameters used: f = 846.6 MHz; σ = 0.909 mho/m; εr = 40.91; 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 – SN7464 ConvF(10.28,10.28,10.28)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.31 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.426 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 0.344 W/kg
SAR(1 g) = 0.28 W/kg; SAR(10 g) = 0.216 W/kg
Maximum value of SAR (measured) = 0.305 W/kg

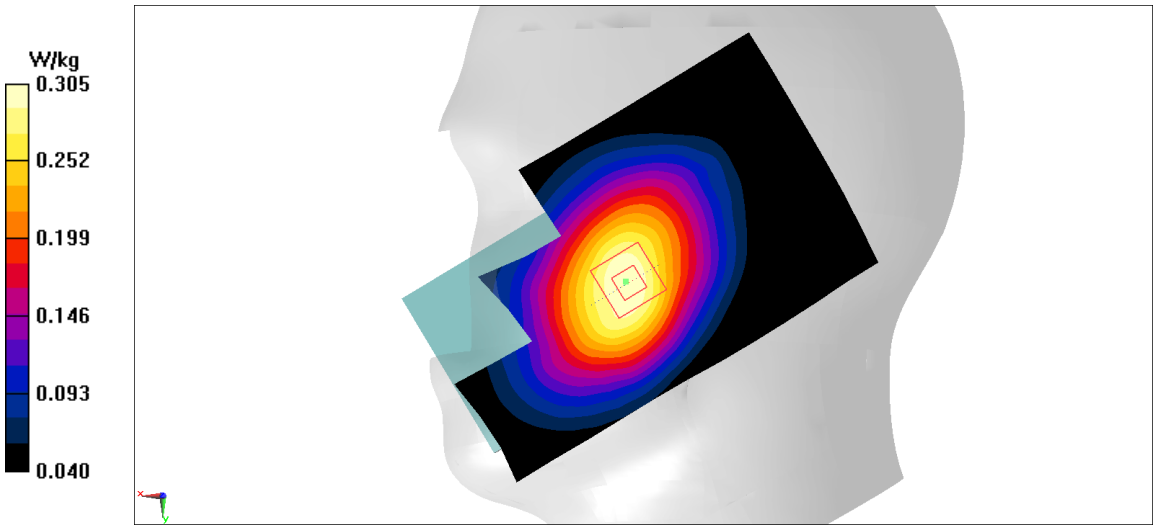


Fig A.9

WCDMA850-BV_CH4233 Rear
Date: 7/6/2018
Electronics: DAE4 Sn1525
Medium: body 835 MHz
Medium parameters used: f = 846.6 MHz; σ = 0.975 mho/m; εr = 55.64; 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 – SN7464 ConvF(10.21,10.21,10.21)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.291 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.14 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.327 W/kg
SAR(1 g) = 0.269 W/kg; SAR(10 g) = 0.213 W/kg
Maximum value of SAR (measured) = 0.291 W/kg

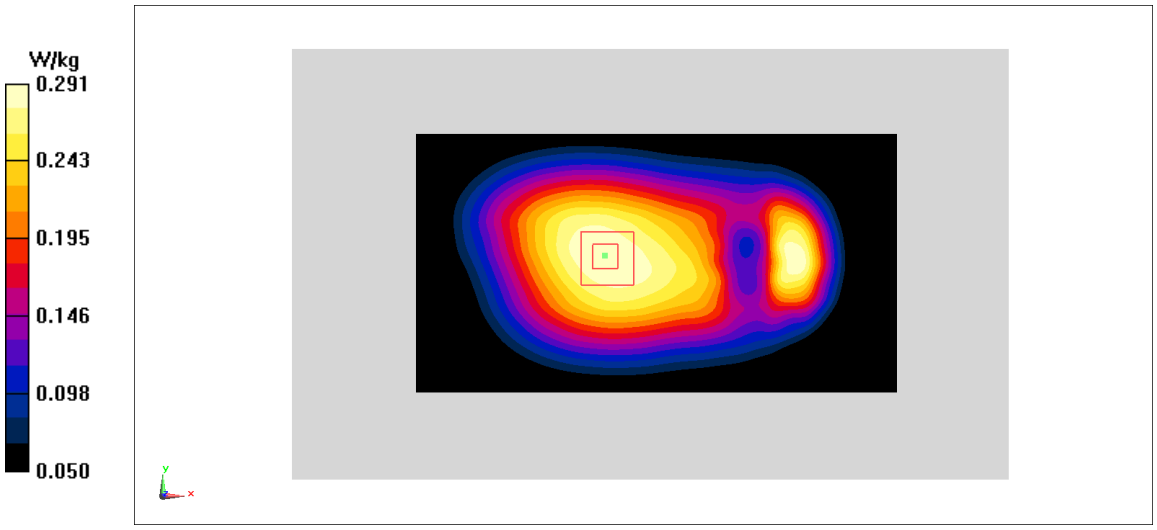


Fig A.10

LTE1900-FDD2_CH18700 Right Cheek
Date: 7/8/2018
Electronics: DAE4 Sn1525
Medium: head 1900 MHz
Medium parameters used: f = 1860 MHz; σ = 1.37 mho/m; εr = 40.79; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1900-FDD2 1860 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7464 ConvF(8.39,8.39,8.39)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.359 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.086 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.457 W/kg
SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.186 W/kg
Maximum value of SAR (measured) = 0.343 W/kg

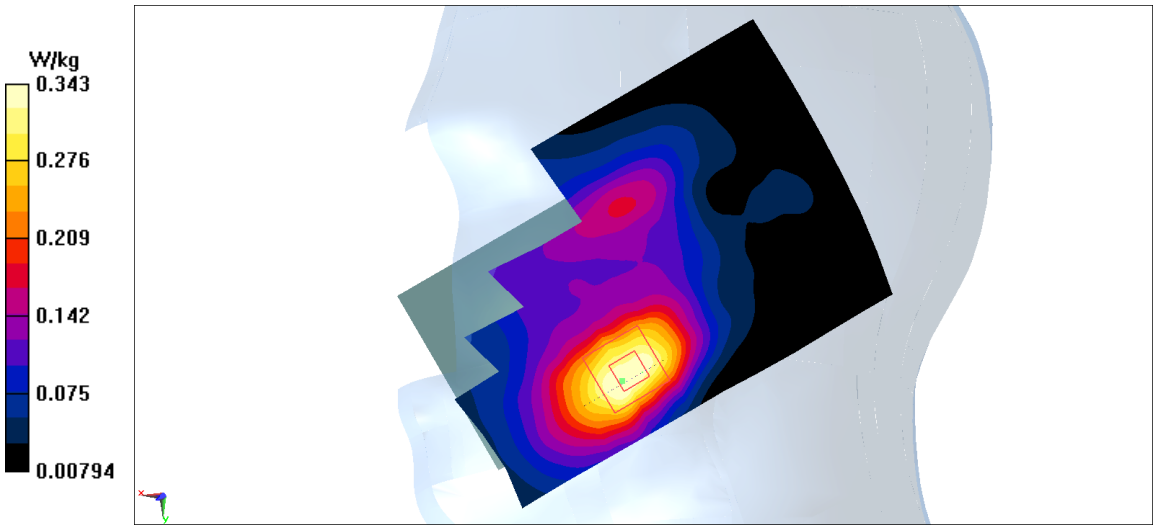


Fig A.11

LTE1900-FDD2_CH18700 Bottom edge
Date: 7/8/2018
Electronics: DAE4 Sn1525
Medium: body 1900 MHz
Medium parameters used: f = 1860 MHz; σ = 1.477 mho/m; εr = 52.53; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1900-FDD2 1860 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7464 ConvF(8.32,8.32,8.32)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.839 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.68 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.638 W/kg; SAR(10 g) = 0.319 W/kg
Maximum value of SAR (measured) = 0.823 W/kg

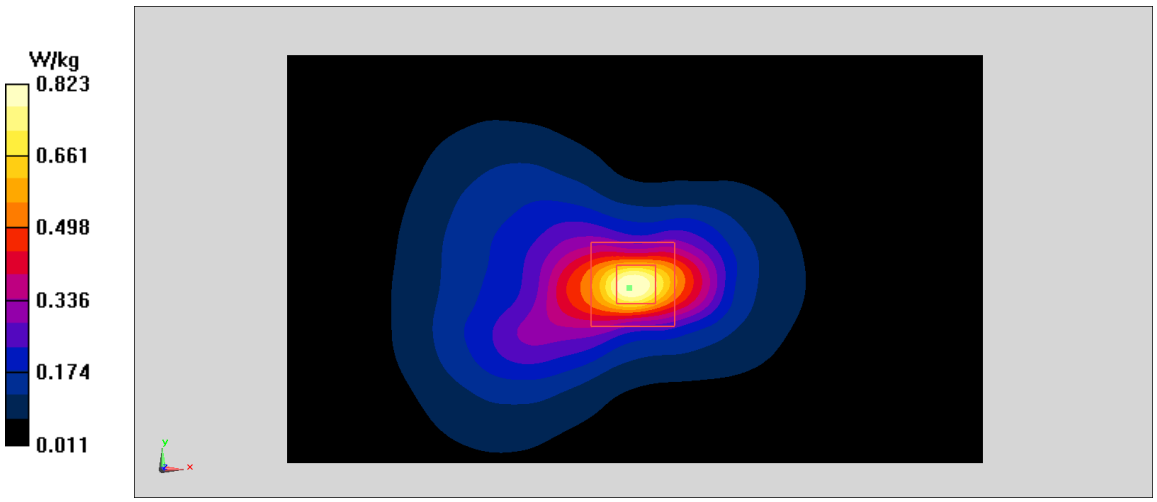


Fig A.12

LTE850-FDD5_CH20450 Right Cheek
Date: 7/6/2018
Electronics: DAE4 Sn1525
Medium: head 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.892 mho/m; εr = 40.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7464 ConvF(10.28,10.28,10.28)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.288 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.308 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.323 W/kg
SAR(1 g) = 0.263 W/kg; SAR(10 g) = 0.204 W/kg
Maximum value of SAR (measured) = 0.287 W/kg

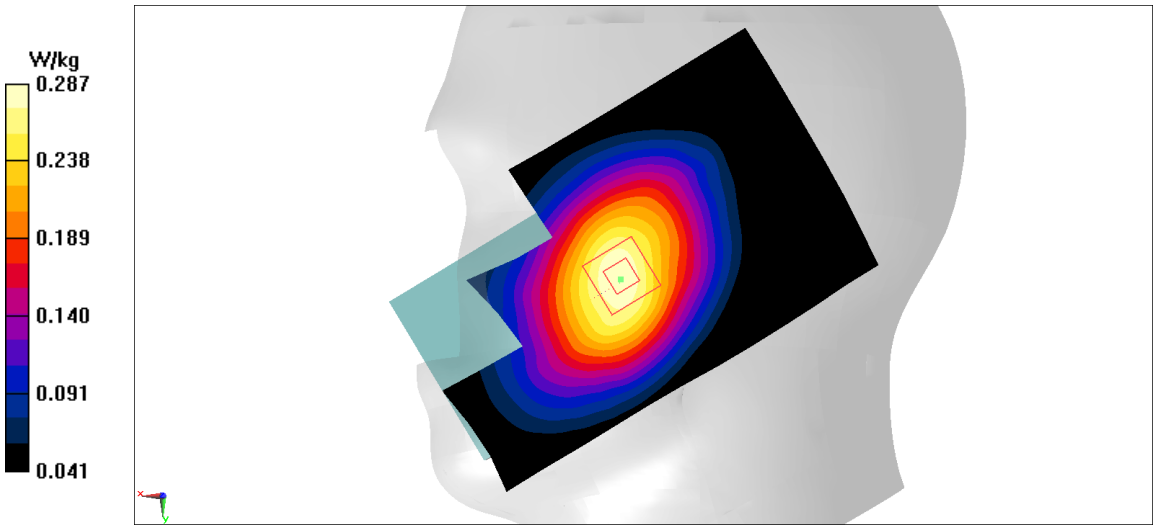


Fig A.13

LTE850-FDD5_CH20450 Rear
Date: 7/6/2018
Electronics: DAE4 Sn1525
Medium: body 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.958 mho/m; εr = 55.66; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7464 ConvF(10.21,10.21,10.21)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.331 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.13 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.369 W/kg
SAR(1 g) = 0.304 W/kg; SAR(10 g) = 0.241 W/kg
Maximum value of SAR (measured) = 0.329 W/kg

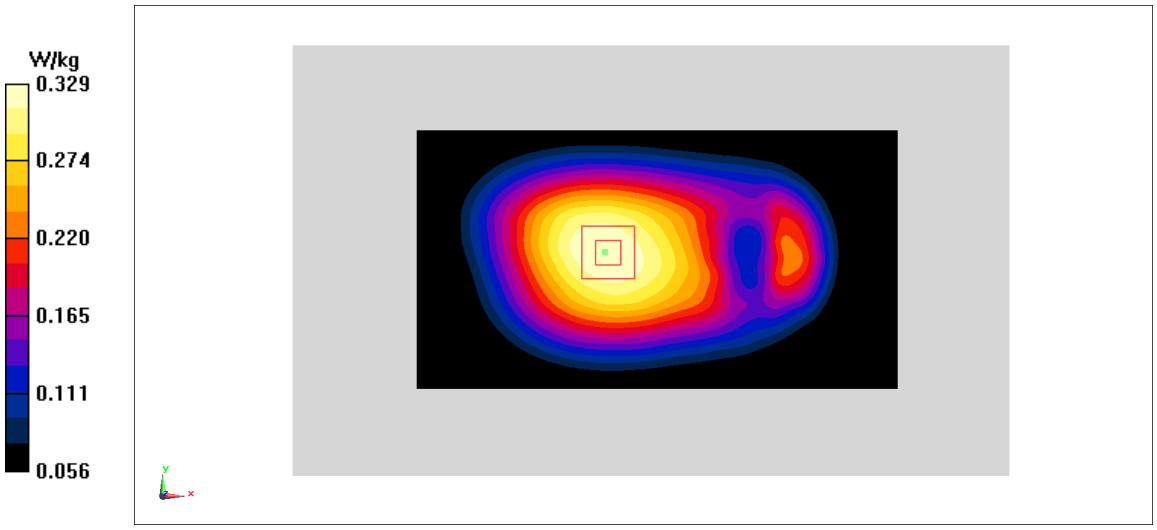


Fig A.14

LTE700-FDD12_CH23060 Right Cheek
Date: 7/5/2018
Electronics: DAE4 Sn1525
Medium: head 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.846 mho/m; εr = 41.34; 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 – SN7464 ConvF(10.57,10.57,10.57)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.318 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.053 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.346 W/kg
SAR(1 g) = 0.296 W/kg; SAR(10 g) = 0.239 W/kg
Maximum value of SAR (measured) = 0.318 W/kg

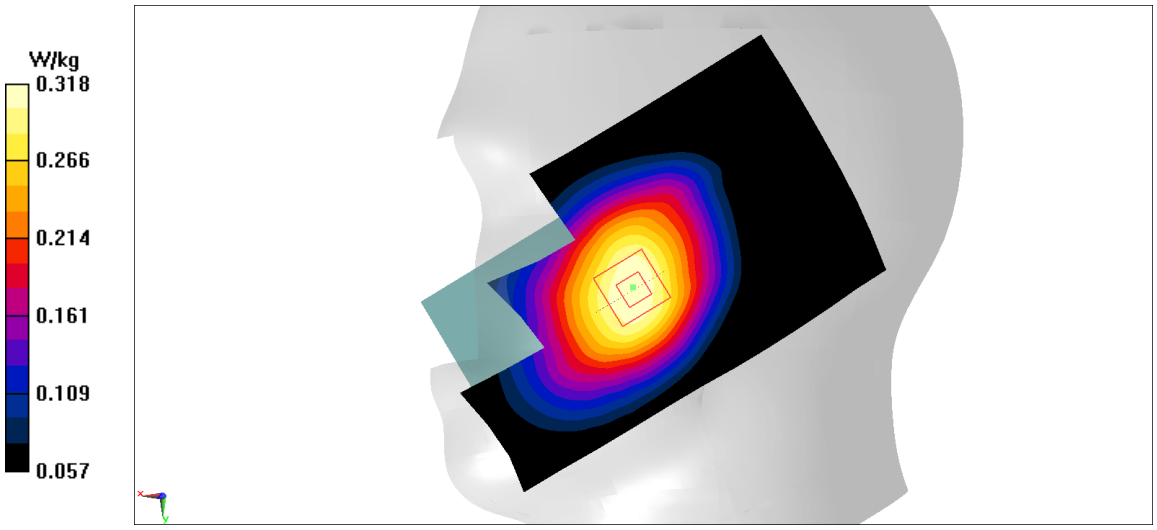


Fig A.15

LTE700-FDD12_CH23060 Rear
Date: 7/5/2018
Electronics: DAE4 Sn1525
Medium: body 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.912 mho/m; εr = 56.19; 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 – SN7464 ConvF(10.63,10.63,10.63)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.39 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.66 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.437 W/kg
SAR(1 g) = 0.354 W/kg; SAR(10 g) = 0.279 W/kg
Maximum value of SAR (measured) = 0.383 W/kg

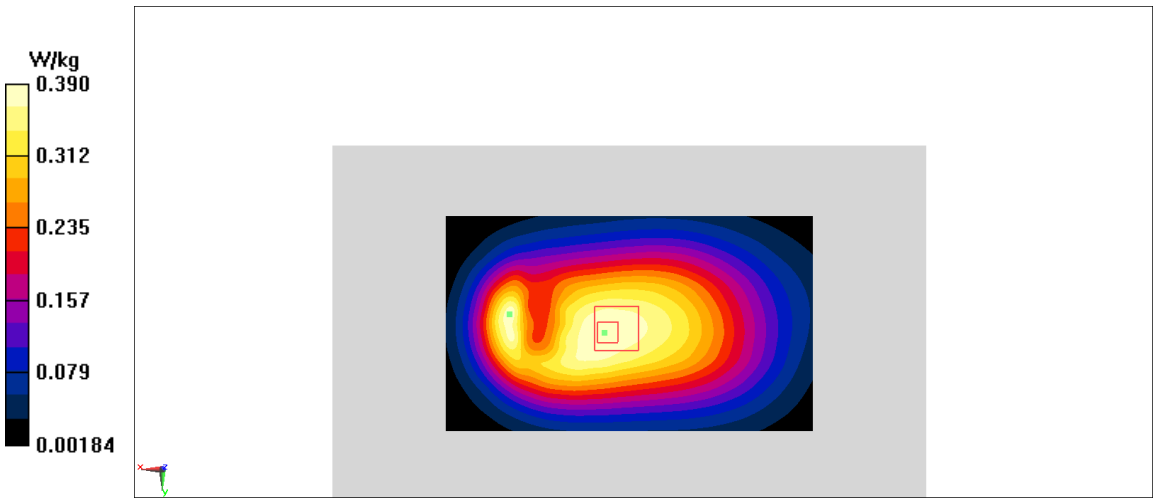


Fig A.16