SAR TEST REPORT

No. I16Z41107-SEM01

For

TCL Communication Ltd.

GSM Quad band/UMTS Tri-band mobile phone

Model name: A572BG

With

Hardware Version: PIO

Software Version: vA3D

FCC ID: 2ACCJB039

Issued Date: 2016-06-12

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.

Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I16Z41107-SEM01	Rev.0	2016-06-12	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

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

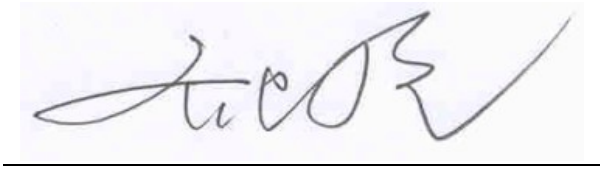
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	January 11, 2016
Testing End Date:	May 28, 2016

1.4 Signature

Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)

Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

This EUT is a variant product and the report of original sample is No.I16Z40966-SEM01. According to the client request, we quote the test results of original sample without all LTE band. The results of spot check are presented in the annex I.

The maximum results of SAR found during testing for TCL Communication Ltd. GSM Quad band/UMTS Tri-band mobile phone A572BG are as follows:

Table 2.1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g (W/Kg)	Equipment Class
Head (Separation Distance 0mm)	GSM 850	0.39	PCE
	PCS 1900	0.39	
	UMTS FDD 2	0.76	
	UMTS FDD 4	0.63	
	UMTS FDD 5	0.44	
	WLAN 2.4 GHz	1.25	DTS
Body-worn (Separation Distance 10mm)	GSM 850	0.79	PCE
	PCS 1900	1.18	
	UMTS FDD 2	1.04	
	UMTS FDD 4	1.14	
	UMTS FDD 5	0.48	
	WLAN 2.4 GHz	0.29	DTS
Body-worn (Data) (Separation Distance 15mm)	UMTS FDD 2	0.63	PCE

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 or 15mm 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**: 1.25 W/kg (1g).**

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

	Band	Position	Main antenna	WLAN	Sum	Distance (mm)	Ratio
Maximum reported SAR value for Head	WCDMA 1900	Left hand, Touch cheek	0.76	0.58	**1.34**	**/**	**/**
	GSM 850	Right hand, Touch cheek	0.37	1.25	**1.62**	69.9	**0.03**
Maximum reported SAR value for Body	WCDMA 1700	Rear	1.14	0.29	**1.43**	/	**/**
	GSM 1900	Bottom	1.18	/	**1.18**	/	**/**

According to the KDB 447498 D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by $(SAR1 + SAR2)^{1.5}/Ri$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

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

	Position	Main antenna	BT*	Sum
Highest reported SAR value for Head	Left hand, Touch cheek	0.76	0.17	**0.93**
Highest reported SAR value for Body	Rear	1.14	0.08	**1.22**
	Bottom	1.18	/	**1.18**

BT* - Estimated SAR for Bluetooth (see the table 13.3)

According to the above tables, the highest sum of reported SAR values is **1.62 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:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

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

4.1 About EUT

Description:	GSM Quad band/UMTS Tri-band mobile phone
Model name:	A572BG
Operating mode(s):	GSM 850/900/1800/1900, WCDMA 850/1700/1900, BT, Wi-Fi
Tested Tx Frequency:	825 – 848.8 MHz (GSM 850)
	1850.2 – 1910 MHz (GSM 1900)
	826.4–846.6 MHz (WCDMA850 Band V)
	1712.4 – 1752.6 MHz (WCDMA 1700 Band IV)
	1852.4–1907.6 MHz (WCDMA1900 Band II)
	2412 – 2462 MHz (Wi-Fi 2.4G)
GPRS/EGPRS Multislot Class:	33
GPRS capability Class:	B
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 132.2mm ;Wide 65.1mm ; Diagonal 147.36mm

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	HW	SW Version
EUT1	014514000001473	PIO	vE7G
EUT2	014514000001440	PIO	vE7G
EUT3	014514000001424	PIO	vE7G
EUT4	014514000001101	PIO	vE7G
EUT5	014514000001457	PIO	vE7G
EUT6	014672000000372	PIO	vA3D
EUT7	014672000000380	PIO	vA3D
EUT8	014672000000406	PIO	vA3D

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

Note: It is performed to test SAR with the EUT1&2&3 and conducted power with the EUT4&5.
It is performed to test Spot check with the EUT6&7 and conducted power with the EUT8.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	CAB1780002C1	/	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 D06 Hotspot Mode SAR v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

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

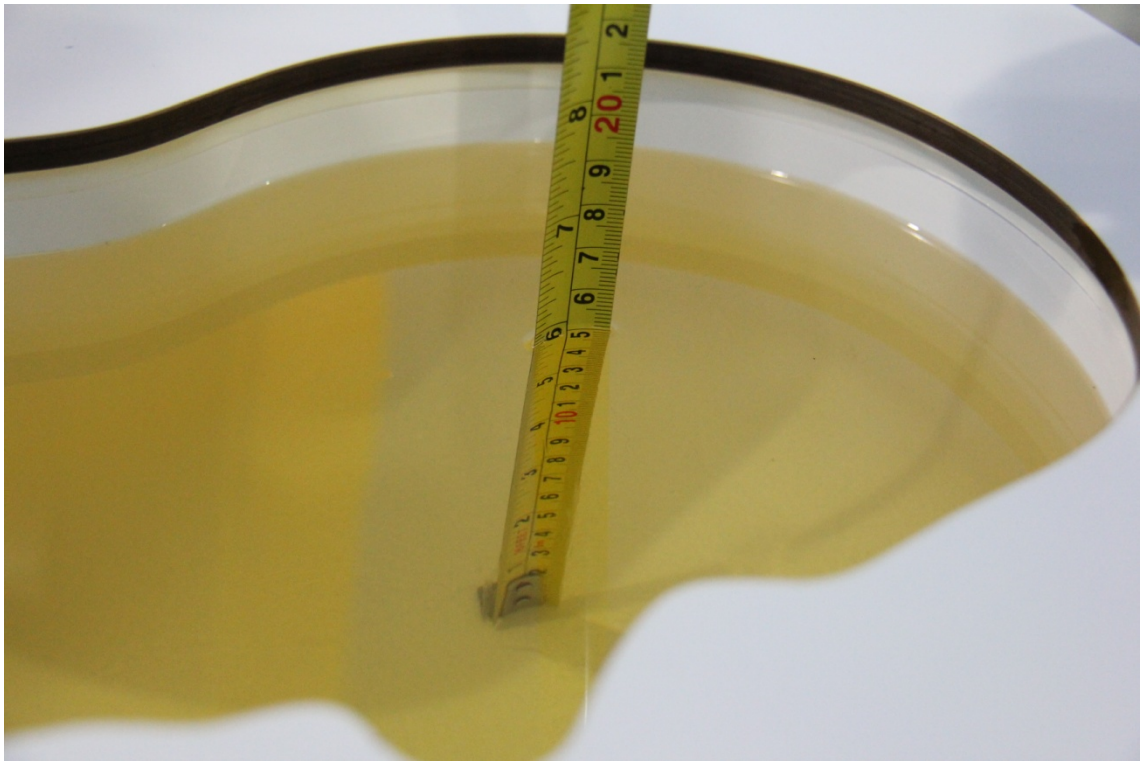
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
835	Body	0.97	0.92～1.02	55.2	52.4～58.0
1750	Head	1.37	1.30～1.44	40.08	38.1～42.1
1750	Body	1.49	1.42～1.56	53.4	50.7～56.1
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
1900	Body	1.52	1.44～1.60	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

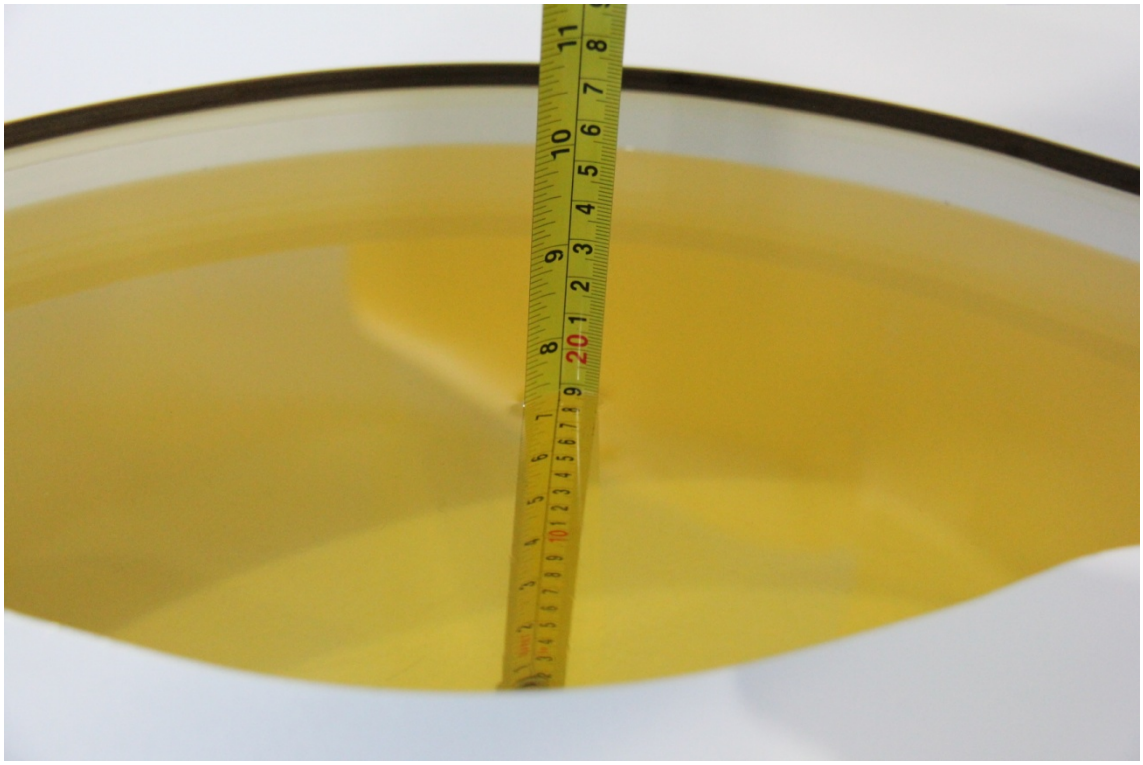
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2016-01-11	Head	835 MHz	41.85	0.84	0.915	1.67
	Body	835 MHz	54.75	-0.82	0.96	-1.03
2016-01-12	Head	1750 MHz	41.41	3.32	1.351	-1.39
	Body	1750 MHz	54.14	1.39	1.459	-2.08
2016-01-13	Head	1900 MHz	40.64	1.60	1.394	-0.43
	Body	1900 MHz	54.59	2.42	1.506	-0.92
2016-01-14	Head	2450 MHz	39.65	1.15	1.817	0.94
	Body	2450 MHz	54.48	3.38	2.006	2.87
2016-05-11	Head	835 MHz	41.22	-0.67	0.923	2.56
	Body	835 MHz	56.36	2.10	0.946	-2.47
2016-05-12	Head	1750 MHz	39.65	-1.07	1.351	-1.39
	Body	1750 MHz	52.78	-1.16	1.481	-0.60
2016-05-13	Head	1900 MHz	39.88	-0.30	1.436	2.57
	Body	1900 MHz	54.23	1.74	1.561	2.70
2016-05-14	Head	2450 MHz	38.55	-1.66	1.834	1.89
	Body	2450 MHz	51.68	-1.94	1.982	1.64
2016-05-25	Head	835 MHz	42.17	1.61	0.929	3.22
	Body	835 MHz	56.01	1.47	0.967	-0.31
2016-05-26	Head	1750 MHz	41.06	2.45	1.378	0.58
	Body	1750 MHz	52.53	-1.63	1.498	0.54
2016-05-27	Head	1900 MHz	39.74	-0.65	1.417	1.21
	Body	1900 MHz	53.01	-0.54	1.54	1.32
2016-05-28	Head	2450 MHz	38.3	-2.30	1.847	2.61
	Body	2450 MHz	51.17	-2.90	1.996	2.36

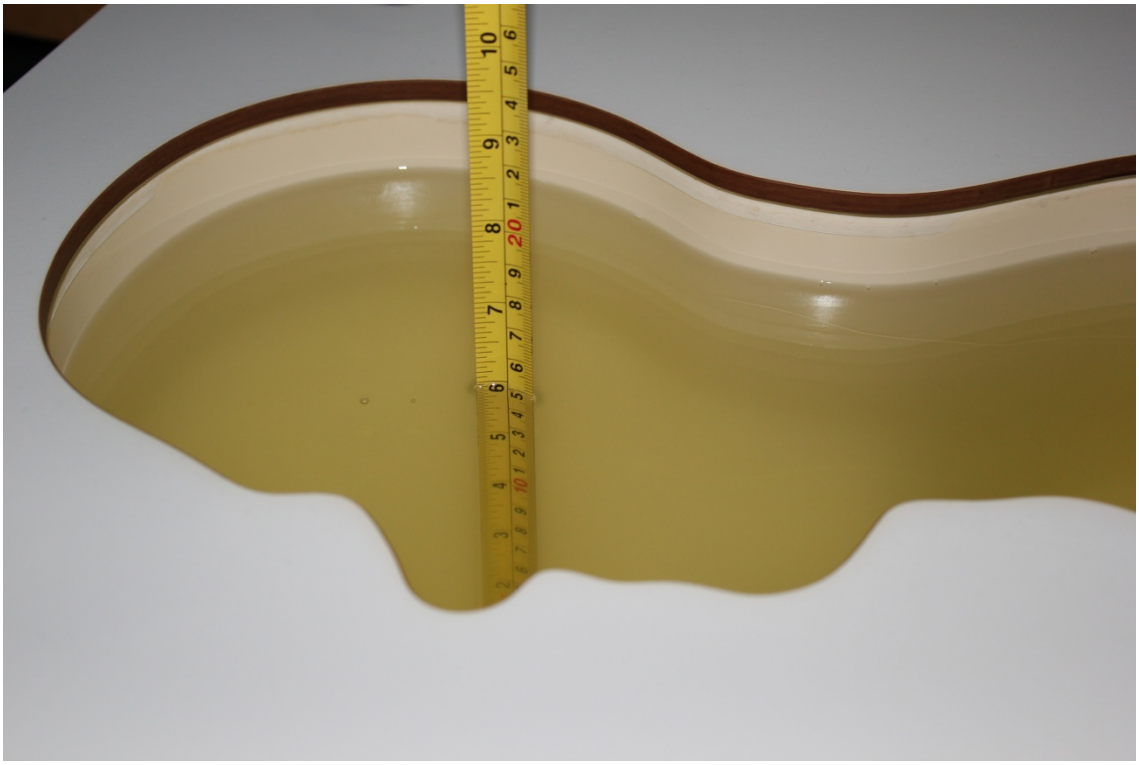
Note: The liquid temperature is 22.0℃



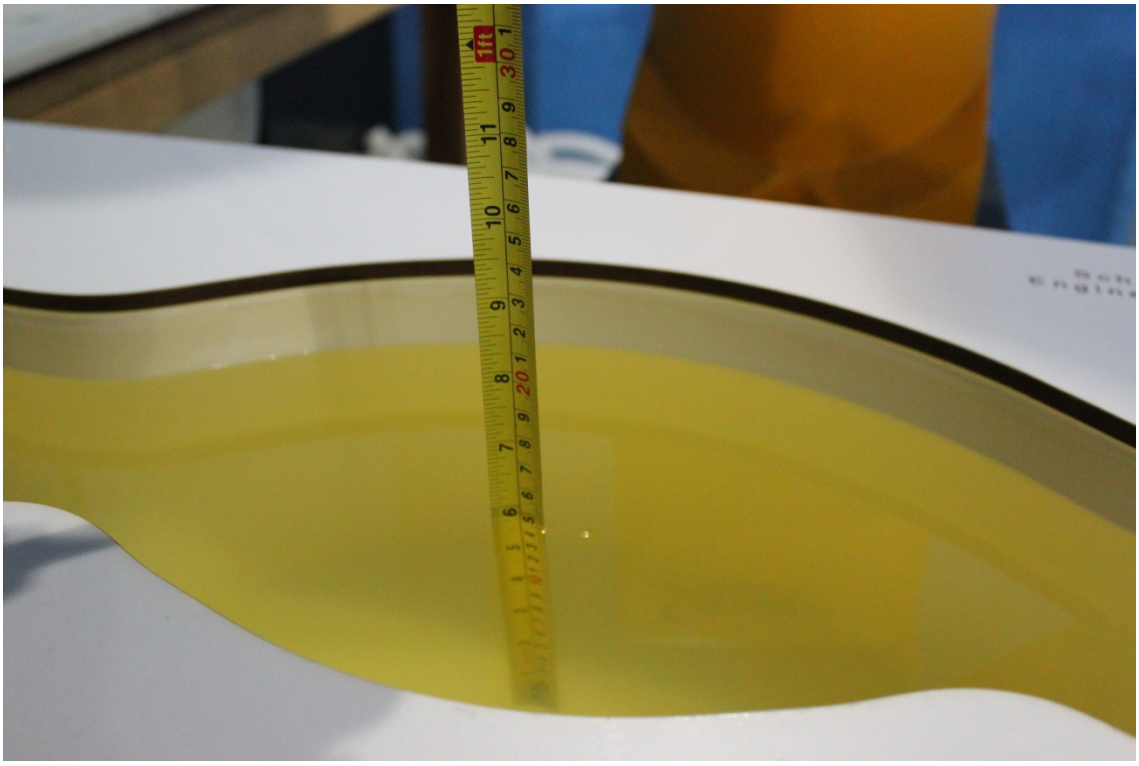
Picture 7-1: Liquid depth in the Head Phantom (835 MHz)



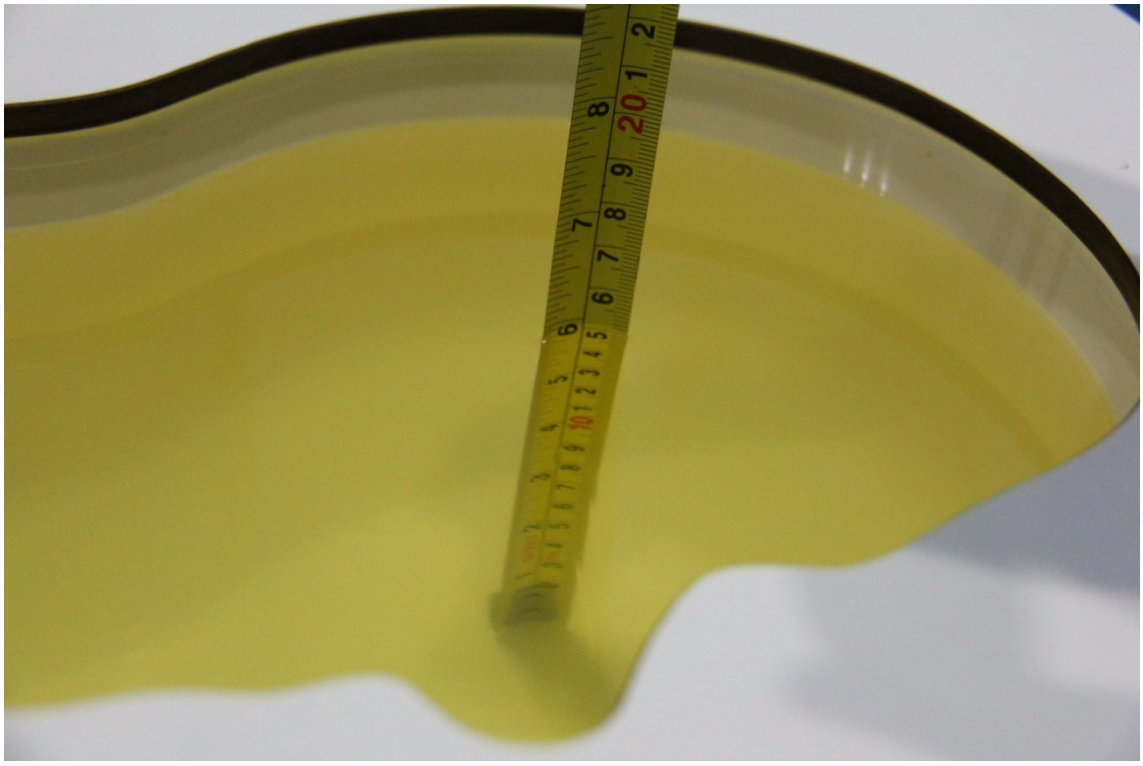
Picture 7-2: Liquid depth in the Flat Phantom (835 MHz)



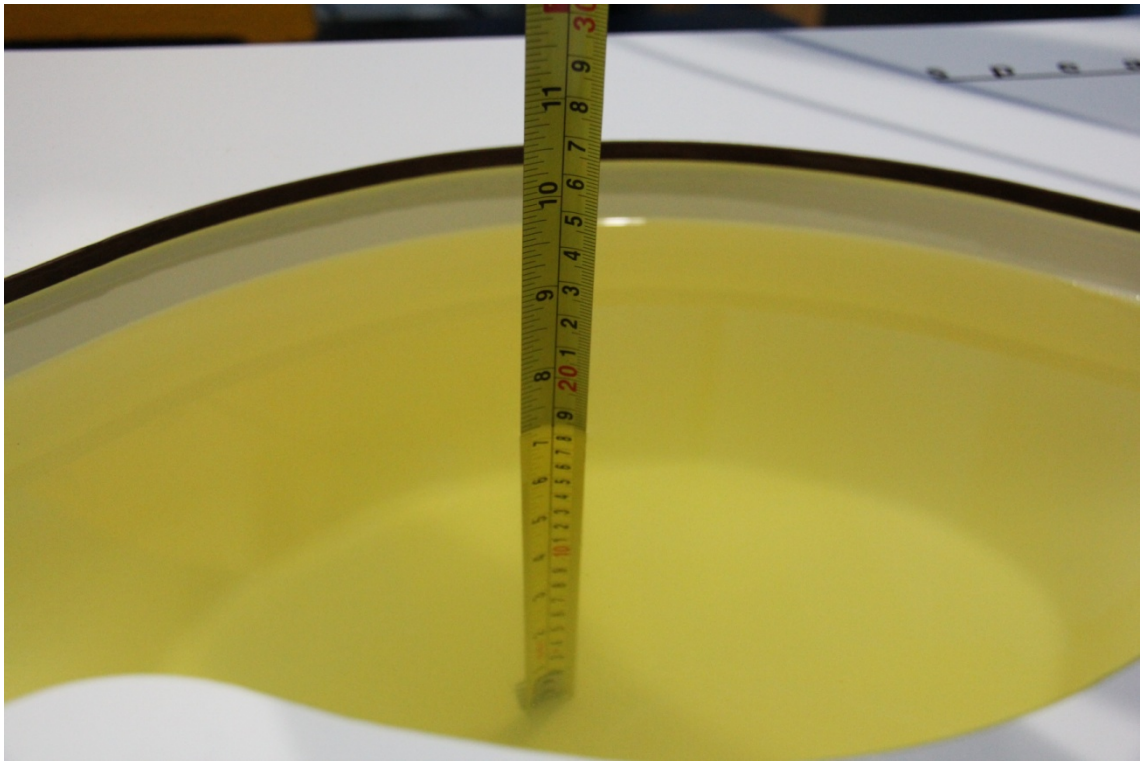
Picture 7-3: Liquid depth in the Head Phantom (1750 MHz)



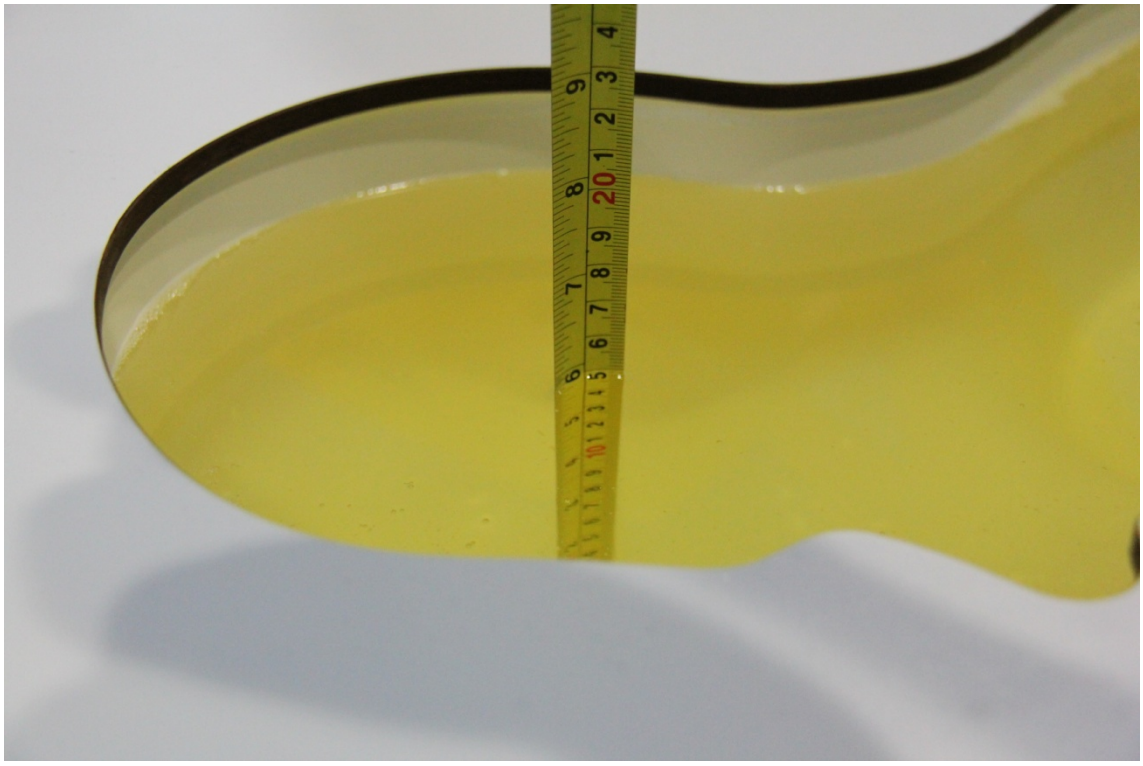
Picture 7-4 Liquid depth in the Flat Phantom (1750MHz)



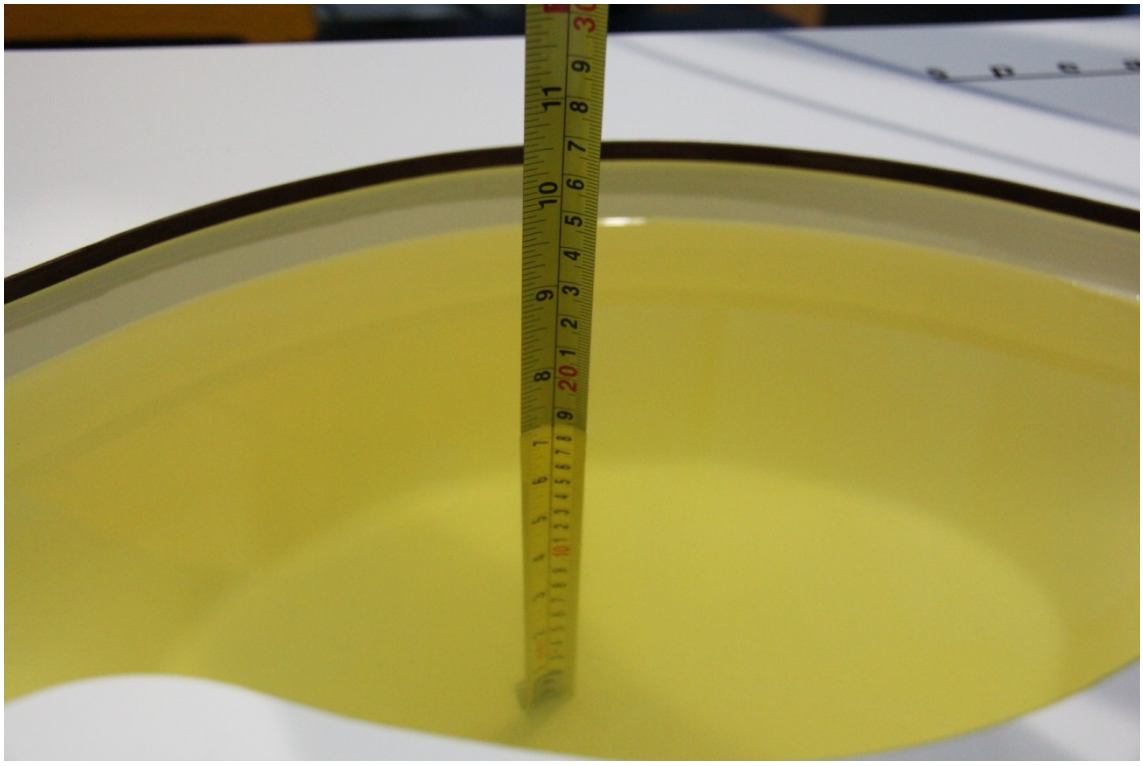
Picture 7-5: Liquid depth in the Head Phantom (1900 MHz)



Picture 7-6 Liquid depth in the Flat Phantom (1900MHz)



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

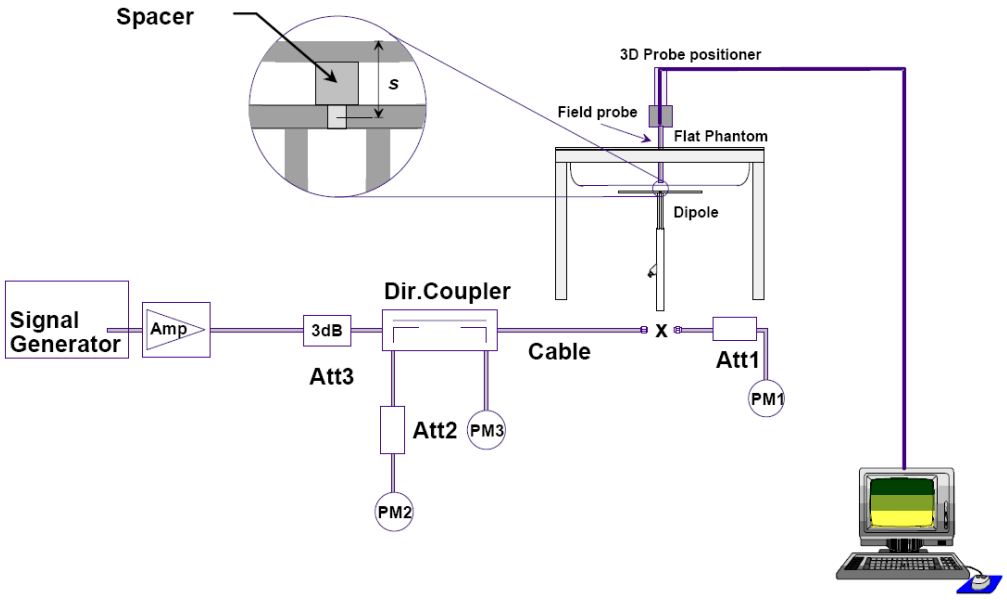


Picture 7-8 Liquid depth in the Flat Phantom (2450MHz)

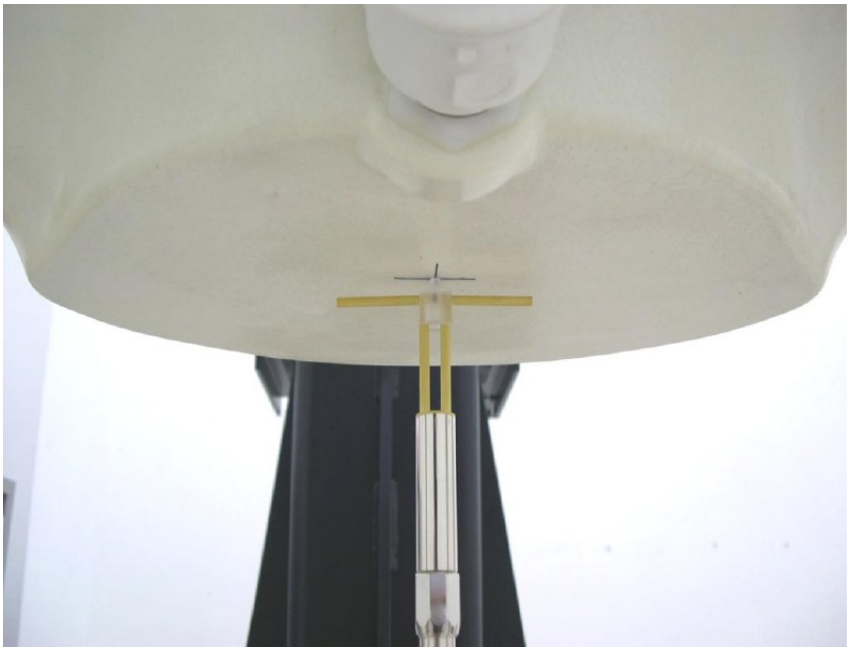
8 System verification

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
2016-01-11	835 MHz	5.86	9.01	5.88	9.08	0.34%	0.78%
2016-01-12	1750 MHz	19.9	36.9	19.60	36.48	-1.51%	-1.14%
2016-01-13	1900 MHz	21.5	40.7	21.72	41.40	1.02%	1.72%
2016-01-14	2450 MHz	24.5	52.5	24.48	52.44	-0.08%	-0.11%
2016-05-25	835 MHz	5.86	9.01	6.00	9.28	2.39%	3.00%
2016-05-26	1750 MHz	19.9	36.9	20.44	37.48	2.71%	1.57%
2016-05-27	1900 MHz	21.5	40.7	22.24	42.00	3.44%	3.19%
2016-05-28	2450 MHz	24.5	52.5	23.88	51.60	-2.53%	-1.71%

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
2016-05-11	835 MHz	6.12	9.29	6.16	9.52	0.65%	2.48%
2016-05-12	1750 MHz	20.3	37.4	19.96	36.56	-1.67%	-2.25%
2016-05-13	1900 MHz	21.7	40.4	21.20	40.80	-2.30%	0.99%
2016-05-14	2450 MHz	24.4	52.1	23.76	50.80	-2.62%	-2.50%
2016-05-25	835 MHz	6.12	9.29	5.92	9.12	-3.27%	-1.83%
2016-05-26	1750 MHz	20.3	37.4	19.64	36.32	-3.25%	-2.89%
2016-05-27	1900 MHz	21.7	40.4	22.04	41.60	1.57%	2.97%
2016-05-28	2450 MHz	24.4	52.1	24.28	51.20	-0.49%	-1.73%

9 Measurement Procedures

9.1 Tests to be performed

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

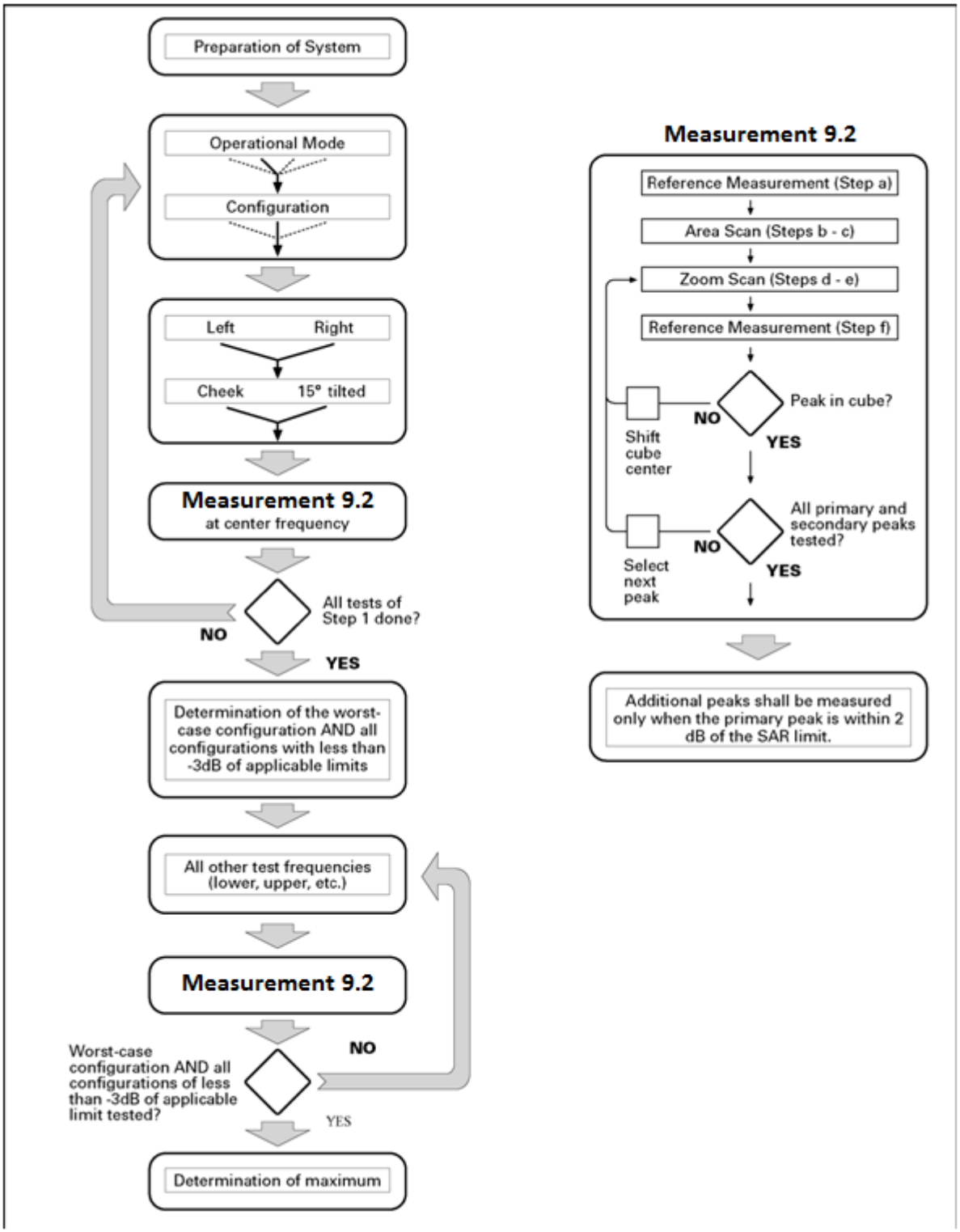
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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

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

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is 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