



SAR TEST REPORT

No. I17N00063-SAR

For

Power Idea Technology (Shenzhen) Co., Ltd.

TD-LTE digital mobile phone

Model Name: MD501

With

Hardware Version: 1.04

Software Version: MD501_US_1.003.00_20170103

FCC ID: ZLE-MD501

Issued Date: 2017-03-23

Note:

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

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I17N00063-SAR	Rev.0	2017-03-23	Initial creation of test report

TABLE OF CONTENT

1 TEST LABORATORY	5
1.1 TESTING LOCATION	5
1.2 TESTING ENVIRONMENT	5
1.3 PROJECT DATA	5
1.4 SIGNATURE	5
2 STATEMENT OF COMPLIANCE	6
3 CLIENT INFORMATION	8
3.1 APPLICANT INFORMATION	8
3.2 MANUFACTURER INFORMATION	8
4 EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	9
4.1 ABOUT EUT	9
4.2 INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	10
4.3 INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	10
5 TEST METHODOLOGY	11
5.1 APPLICABLE LIMIT REGULATIONS	11
5.2 APPLICABLE MEASUREMENT STANDARDS	11
6 SPECIFIC ABSORPTION RATE (SAR)	12
6.1 INTRODUCTION	12
6.2 SAR DEFINITION	12
7 TISSUE SIMULATING LIQUIDS	13
7.1 TARGETS FOR TISSUE SIMULATING LIQUID	13
7.2 DIELECTRIC PERFORMANCE	13
8 SYSTEM VERIFICATION	20
8.1 SYSTEM SETUP	20
8.2 SYSTEM VERIFICATION	21
9 MEASUREMENT PROCEDURES	22
9.1 TESTS TO BE PERFORMED	22
9.2 GENERAL MEASUREMENT PROCEDURE	23
9.3 WCDMA MEASUREMENT PROCEDURES FOR SAR	24
9.4 BLUETOOTH & WI-FI MEASUREMENT PROCEDURES FOR SAR	25
9.5 SAR MEASUREMENT FOR LTE	25
9.6 POWER DRIFT	26
10 AREA SCAN BASED 1-G SAR	27
10.1 REQUIREMENT OF KDB	27
10.2 FAST SAR ALGORITHMS	27
11 CONDUCTED OUTPUT POWER	28

11.1 MANUFACTURING TOLERANCE	28
11.2 GSM MEASUREMENT RESULT	33
11.3 WCDMA MEASUREMENT RESULT	34
11.4 LTE_FDD MEASUREMENT RESULT	35
11.5 WI-FI AND BT MEASUREMENT RESULT	57
12 SIMULTANEOUS TX SAR CONSIDERATIONS	58
12.1 INTRODUCTION	58
12.2 TRANSMIT ANTENNA SEPARATION DISTANCES	58
12.3 SAR MEASUREMENT POSITIONS	59
12.4 STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	59
13 EVALUATION OF SIMULTANEOUS	60
14 SAR TEST RESULT	61
14.1 SAR RESULTS FOR FAST SAR	62
14.2 SAR RESULTS FOR STANDARD PROCEDURE	76
14.3 WLAN EVALUATION	81
15 SAR MEASUREMENT VARIABILITY	84
16 MEASUREMENT UNCERTAINTY	85
16.1 MEASUREMENT UNCERTAINTY FOR NORMAL SAR TESTS (300MHz~3GHz)	85
16.2 MEASUREMENT UNCERTAINTY FOR FAST SAR TESTS (300MHz~3GHz)	86
17 MAIN TEST INSTRUMENTS	87
ANNEX A GRAPH RESULTS	88
ANNEX B SYSTEM VERIFICATION RESULTS	148
ANNEX C SAR MEASUREMENT SETUP	161
C.1 MEASUREMENT SET-UP	161
C.2 DASY5 E-FIELD PROBE SYSTEM	162
C.3 E-FIELD PROBE CALIBRATION	162
C.4 OTHER TEST EQUIPMENT	163
ANNEX D POSITION OF THE WIRELESS DEVICE IN RELATION TO THE PHANTOM	167
D.1 GENERAL CONSIDERATIONS	167
D.2 BODY-WORN DEVICE	168
D.3 DESKTOP DEVICE	168
D.4 DUT SETUP PHOTOS	169
ANNEX E EQUIVALENT MEDIA RECIPES	170
ANNEX F SYSTEM VALIDATION	171
ANNEX G DAE CALIBRATION CERTIFICATE	172
ANNEX H PROBE CALIBRATION CERTIFICATE	177
ANNEX I DIPOLE CALIBRATION CERTIFICATE	188

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL(Shenzhen)
Address:	TCL International E City No.1001 Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province P.R.China

1.2 Testing Environment

Temperature:	18°C~25 °C
Relative humidity:	30%~ 70%
Ground system resistance:	<4Ω
Ambient noise & Reflection:	< 0.012 W/kg

1.3 Project Data

Project Leader:	Cao Junfei
Test Engineer:	Zhang Yunzhuan
Testing Start Date:	February 12, 2017
Testing End Date:	March 15, 2017

1.4 Signature



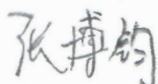
Zhang Yunzhuan

(Prepared this test report)



Cao Junfei

(Reviewed this test report)



Zhang Bojun

Deputy Director of the laboratory
(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Power Idea Technology (Shenzhen) Co., Ltd. TD-LTE digital mobile phone MD501 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)	GSM850	0.44	PCE
	PCS1900	0.13	
	UMTS FDD 5	0.42	
	UMTS FDD 2	0.24	
	LTE Band 2	0.24	
	LTE Band 4	0.31	
	LTE Band 5	0.36	
	LTE Band 7	0.23	
	LTE Band 12	0.16	
	LTE Band 13	0.31	
	LTE Band 17	0.16	
	LTE Band 25	0.18	
	LTE Band 26	0.26	
	LTE Band 38	0.11	
	WLAN 2.4GHz	0.43	DTS
Body-worn (Data) (Separation Distance 10mm)	GSM850	0.73	PCE
	PCS1900	0.68	
	UMTS FDD 5	0.46	
	UMTS FDD 2	0.79	
	LTE Band 2	0.50	
	LTE Band 4	0.59	
	LTE Band 5	0.27	
	LTE Band 7	1.16	
	LTE Band 12	0.18	
	LTE Band 13	0.36	
	LTE Band 17	0.16	
	LTE Band 25	0.57	
	LTE Band 26	0.35	
	LTE Band 38	0.55	
	WLAN 2.4GHz	0.17	DTS

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the ANSI C95.1-1999.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal 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: **1.16W/kg (1g)**.

Table 2.2: The sum of reported SAR values for main antenna and Wi-Fi

	Position	Main antenna	Wi-Fi	Sum
Highest reported SAR value for Head	Left Touch	0.44	0.43	0.87
Highest reported SAR value for Body	Rear	0.79	0.17	0.96
	Bottom	1.16	/	1.16

Table2.3: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT*	Sum
Highest reported SAR value for Head	Right Touch	0.44	0.21	0.65
Highest reported SAR value for Body	Rear	0.79	0.12	0.91
	Bottom	1.16	/	1.16

BT*-Estimated SAR for Bluetooth (seethetable13.3)

According to the above tables, the highest sum of reported SAR values is **1.16 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	Power Idea Technology (Shenzhen) Co., Ltd.
Address /Post:	4th Floor, A Section , Languang Science & technology Building , No.7 Xinx RD , Hi-Tech Industrial Park North , Nanshan District , ShenZhen , P.R.C.
Contact:	alex.ma
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Telephone:	0755-86220211
Fax:	/

3.2 Manufacturer Information

Company Name:	Power Idea Technology (Shenzhen) Co., Ltd.
Address /Post:	4th Floor, A Section , Languang Science & technology Building , No.7 Xinx RD , Hi-Tech Industrial Park North , Nanshan District , ShenZhen , P.R.C. v
Contact:	alex.ma
Email:	alex.ma@pwidea.com
Telephone:	0755-86220211
Fax:	/

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

4.1 About EUT

Description:	TD-LTE digital mobile phone
Model Name:	MD501
Operating mode(s):	GSM 850/1900/900/1800, WCDMA 850/1900/900/2100, LTE_FDD Band 2/4/5/7/12/13/17/25/26, LTE_TDD Band 38, BT, Wi-Fi 2.4G
Tested Tx Frequency:	825–848.8 MHz (GSM 850)
	1850.2–1910 MHz (GSM 1900)
	826.4–846.6 MHz (WCDMA850 Band V)
	1852.4–1907.6 MHz (WCDMA1900 Band II)
	1850.7–1909.3 MHz (LTE_FDD Band 2)
	1710.7–1754.3 MHz (LTE_FDD Band 4)
	824.7–848.3 MHz (LTE_FDD Band 5)
	2502.5–2567.5 MHz (LTE_FDD Band 7)
	699.7–715.3 MHz (LTE_FDD Band 12)
	779.5–784.5 MHz (LTE_FDD Band 13)
	706.5–713.5 MHz (LTE_FDD Band 17)
	1850.7–1914.3 MHz (LTE_FDD Band 25)
	814.7–848.3 MHz (LTE_FDD Band 26)
	2572.5–2617.5 MHz (LTE_TDD Band 38)
	2412 – 2462 MHz (Wi-Fi 2.4G)
GPRS&EGPRS Multislot Class:	12
GPRS capability Class:	/
WCDMA Category:	HSDPA: 14
	HSUPA: 6
	HSPA+ (Uplink category): 7
	HSPA+ (Downlink category): 24
	DC-HSDPA: 24
Release Version:	GSM: Rel5
	GPRS: Rel5
	UMTS: 8
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Accessories/Body-worn configurations:	Headset
Hotspot mode:	Support simultaneous transmission of hotspot and voice(or data)

4.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	IMEI:867453021949683	1.04	MD501_US_1.003.00_20170103
EUT2	IMEI:867453021949691	1.04	MD501_US_1.003.00_20170103
EUT3	IMEI:867453021949642	1.04	MD501_US_1.003.00_20170103

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

Note: It is performed to test SAR with the EUT 1 & EUT 2, and conducted power with the EUT 3

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	Li-ion Rechargeable Battery	/	Springpower Technology (Shenzhen) Co., LTD
AE2	Headset	Handset	/	Shenzhen Dechangsheng Electronic Technology Co., Ltd.

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

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1999: 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: Experimental Techniques.

KDB 447498 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

KDB 941225 D06 Hot Spot SAR v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB 248227 D01 802.11 Wi-Fi SAR v02r02: SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters.

KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz.

KDB 865664 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 heat 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

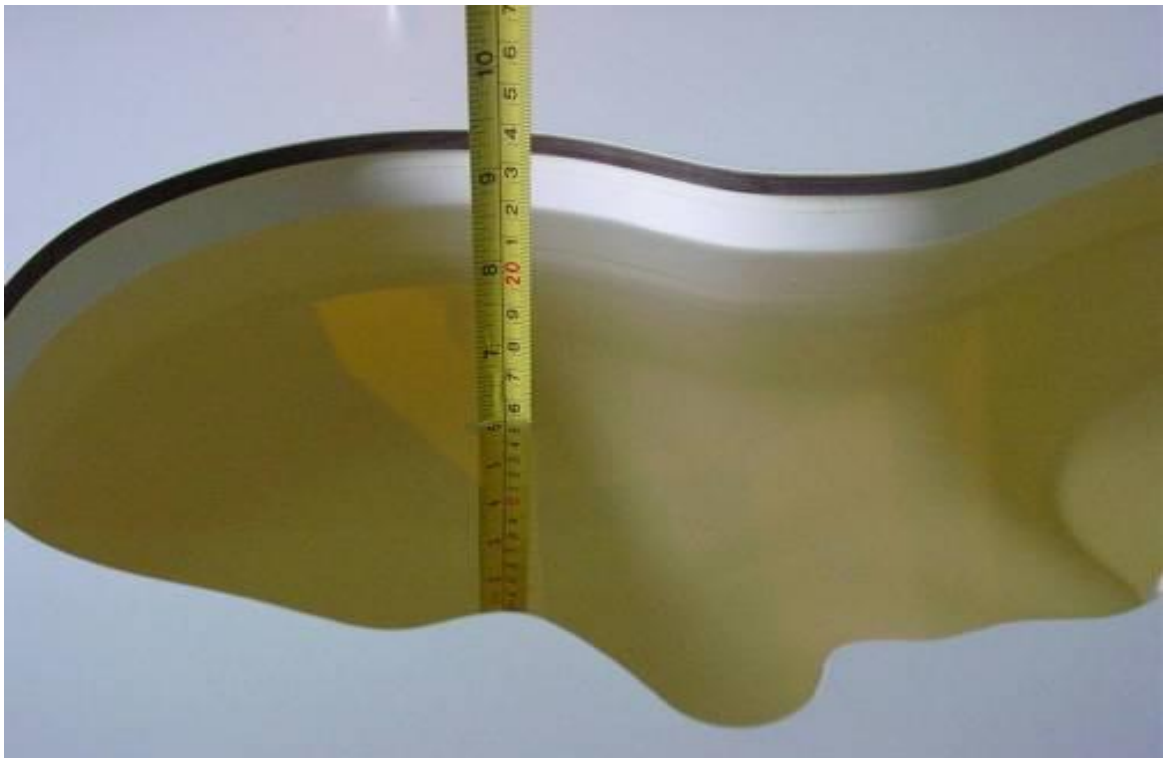
Frequency (MHz)	Liquid Type	Conductivity (σ)	$\pm 5\%$ Range	Permittivity (ϵ)	$\pm 5\%$ Range
750	Head	0.89	0.85~0.93	41.94	39.8~44.0
750	Body	0.96	0.91~1.01	55.5	52.7~58.3
835	Head	0.90	0.86~0.95	41.5	39.4~43.6
835	Body	0.97	0.92~1.02	55.2	52.4~58.0
1800	Head	1.40	1.33~1.47	40.0	38.0~42.0
1800	Body	1.52	1.44~1.60	53.3	50.6~56.0
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
2550	Head	1.91	1.82~2.00	39.07	37.2~41.0
2550	Body	2.09	1.99~2.19	52.6	50.0~55.2

7.2 Dielectric Performance

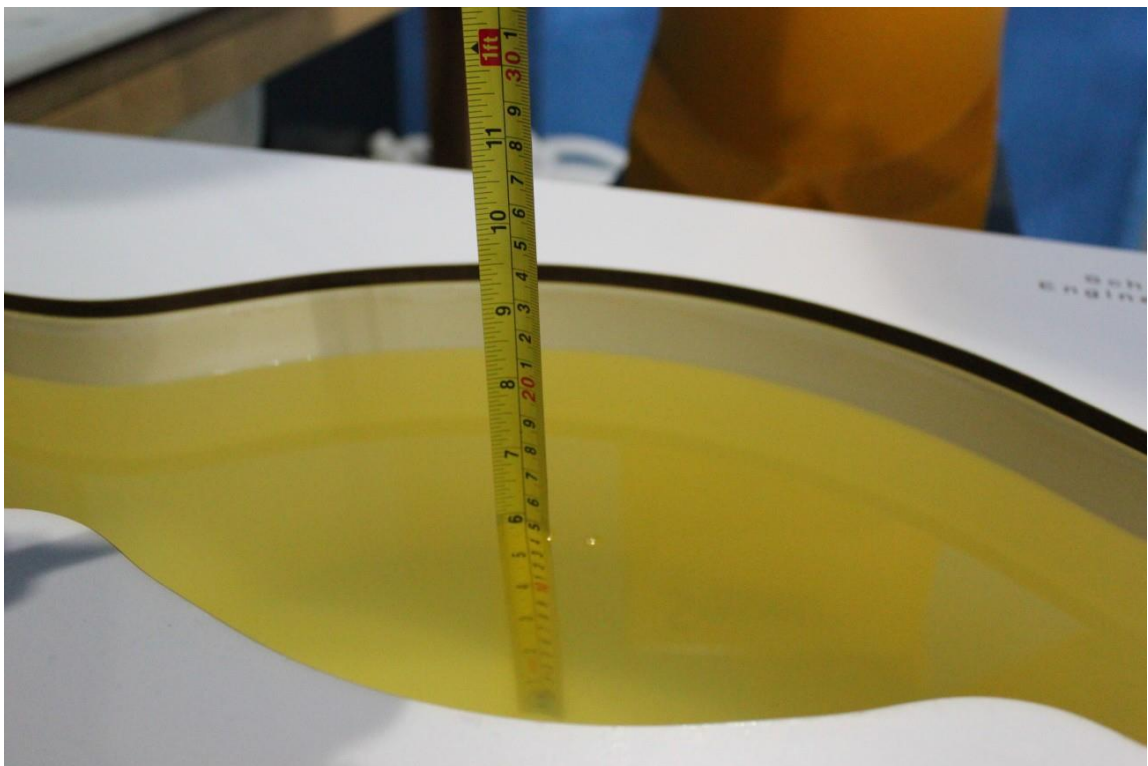
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ϵ	Drift (%)	Conductivity σ (S/m)	Drift (%)
2017-2-22	Head	750	41.14	-1.91	0.914	2.70
2017-2-22	Body	750	53.92	-2.85	0.942	-1.88
2017-2-18	Head	835	40.83	-1.61	0.885	-1.67
2017-2-18	Body	835	55.68	0.87	0.975	0.52
2017-2-13	Head	1800	40.99	2.48	1.384	-1.14
2017-2-13	Body	1800	53.22	-0.15	1.502	-1.18
2017-2-12	Head	1900	40.66	1.65	1.419	1.36
2017-2-12	Body	1900	52.95	-0.66	1.548	1.84
2017-2-15	Head	2450	37.87	-3.39	1.853	2.94
2017-2-15	Body	2450	54.65	3.70	1.914	-1.85
2017-3-15	Head	2550	38.66	-1.05	1.936	1.36
2017-3-15	Body	2550	51.64	-1.83	2.048	-2.01

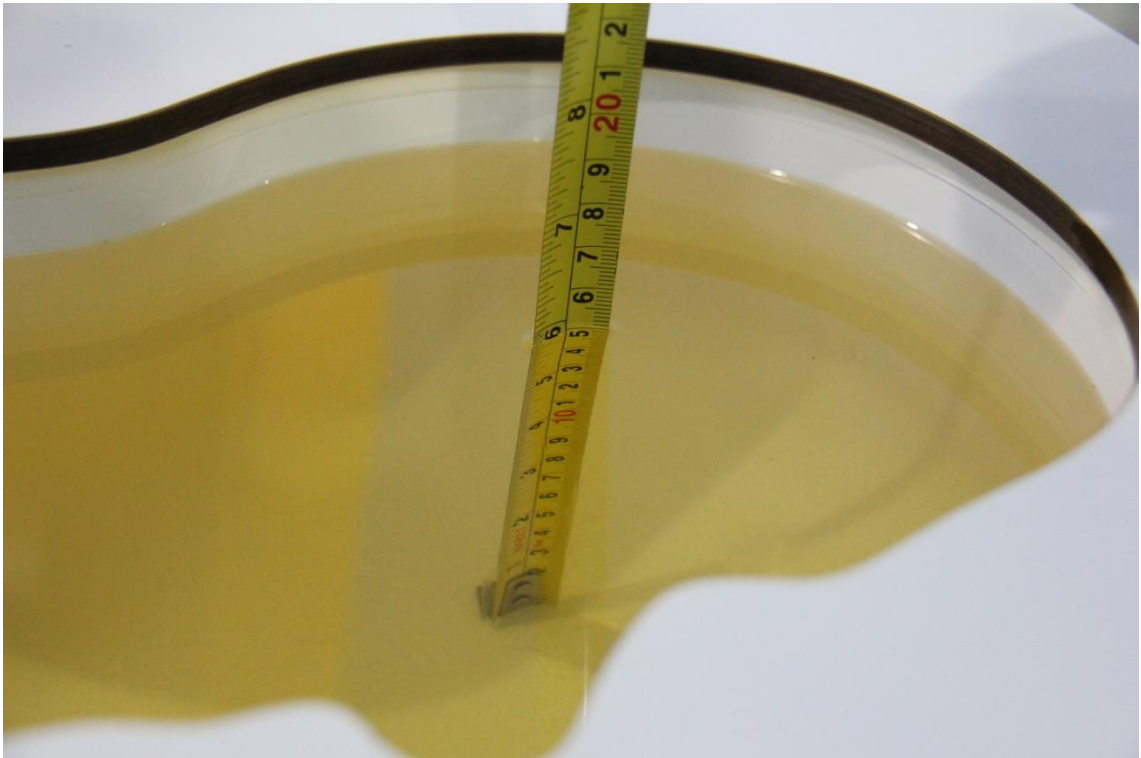
Note: The liquid temperature is 22.0°C



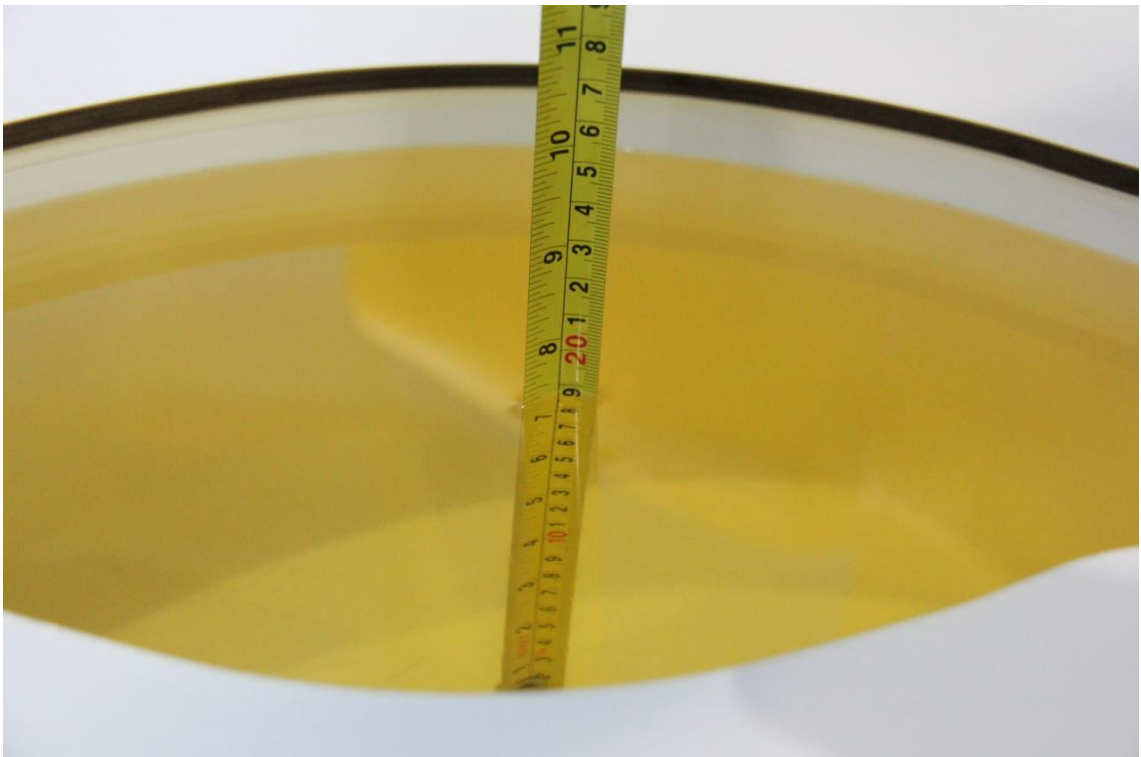
Picture 7-1: Liquid depth in the Head Phantom (750 MHz)



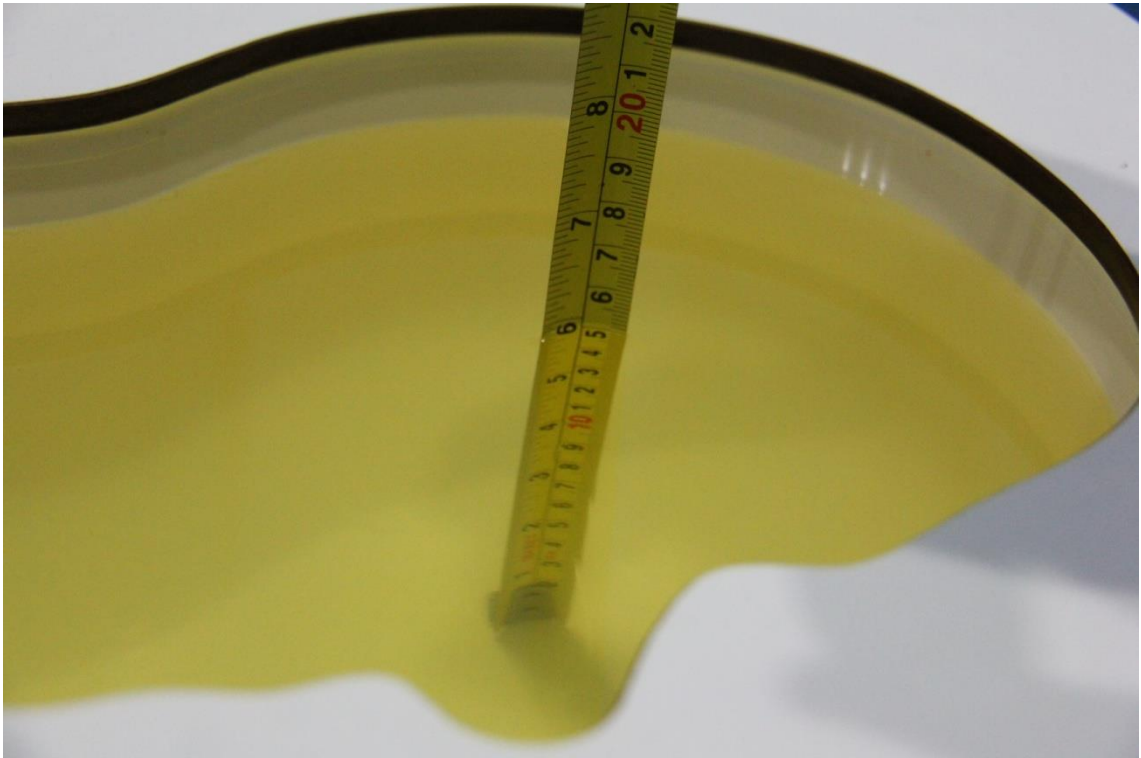
Picture 7-2: Liquid depth in the Flat Phantom (750 MHz)



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



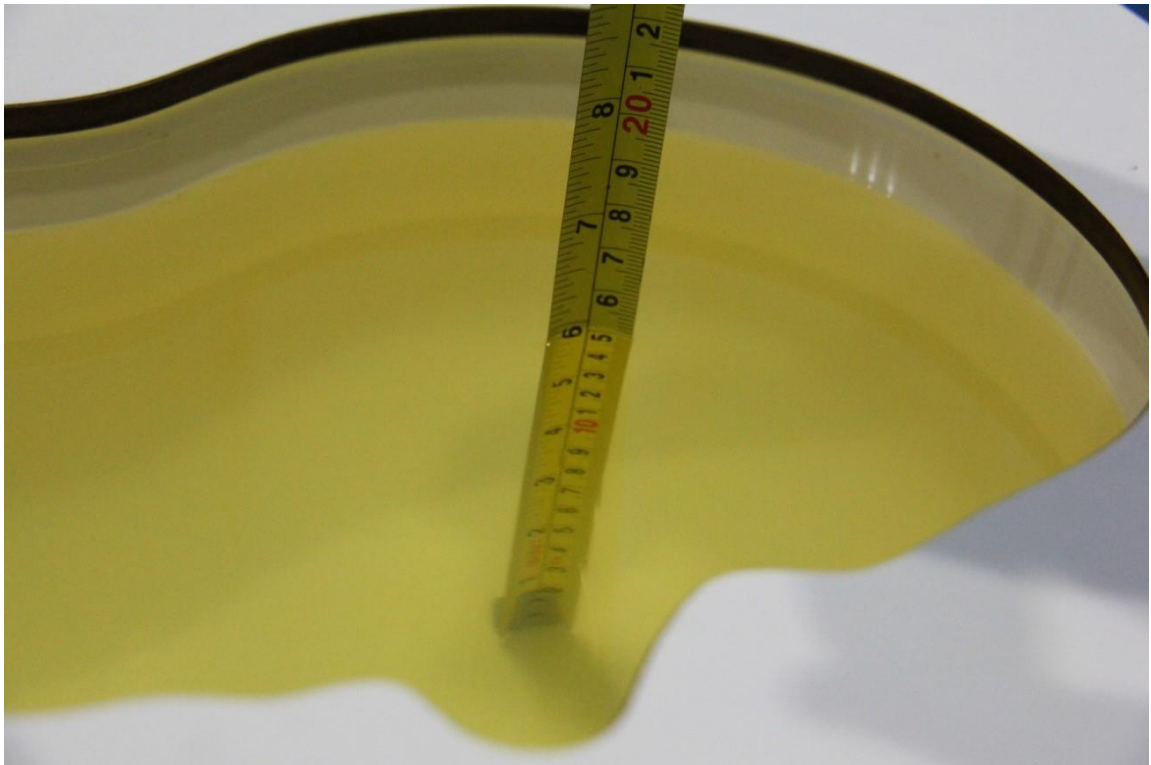
Picture 7-4: Liquid depth in the Flat Phantom (835 MHz)



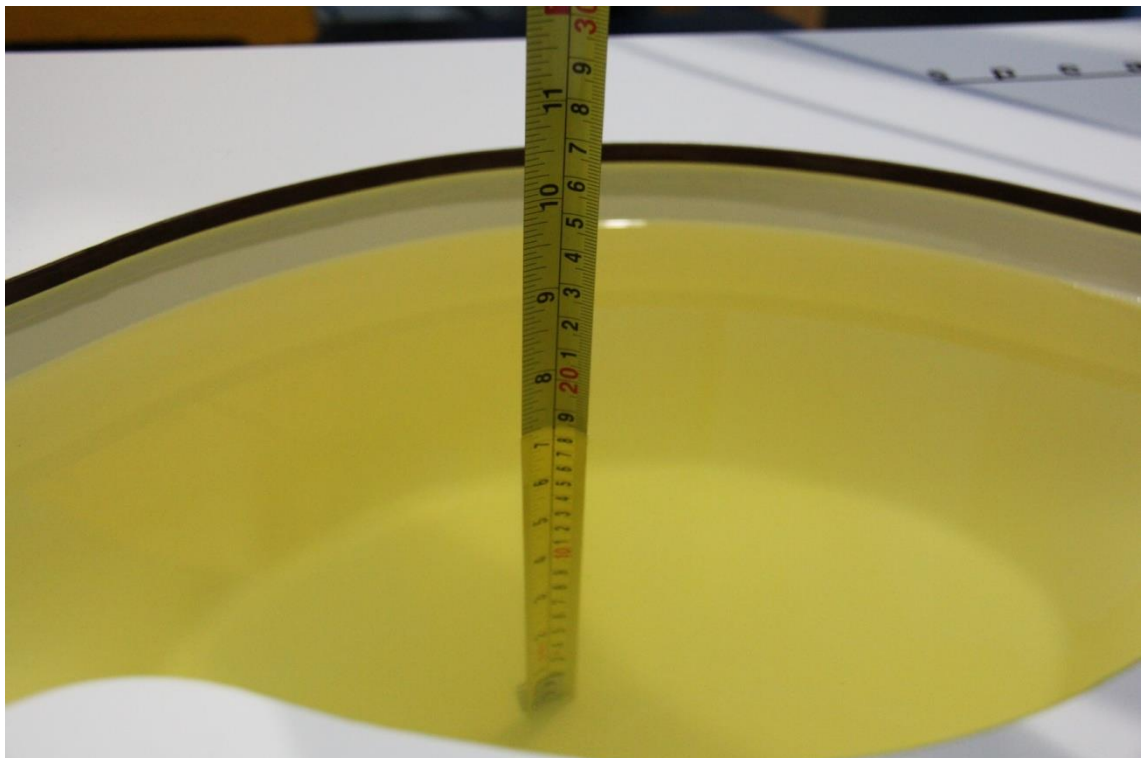
Picture 7-5: Liquid depth in the Head Phantom (1800 MHz)



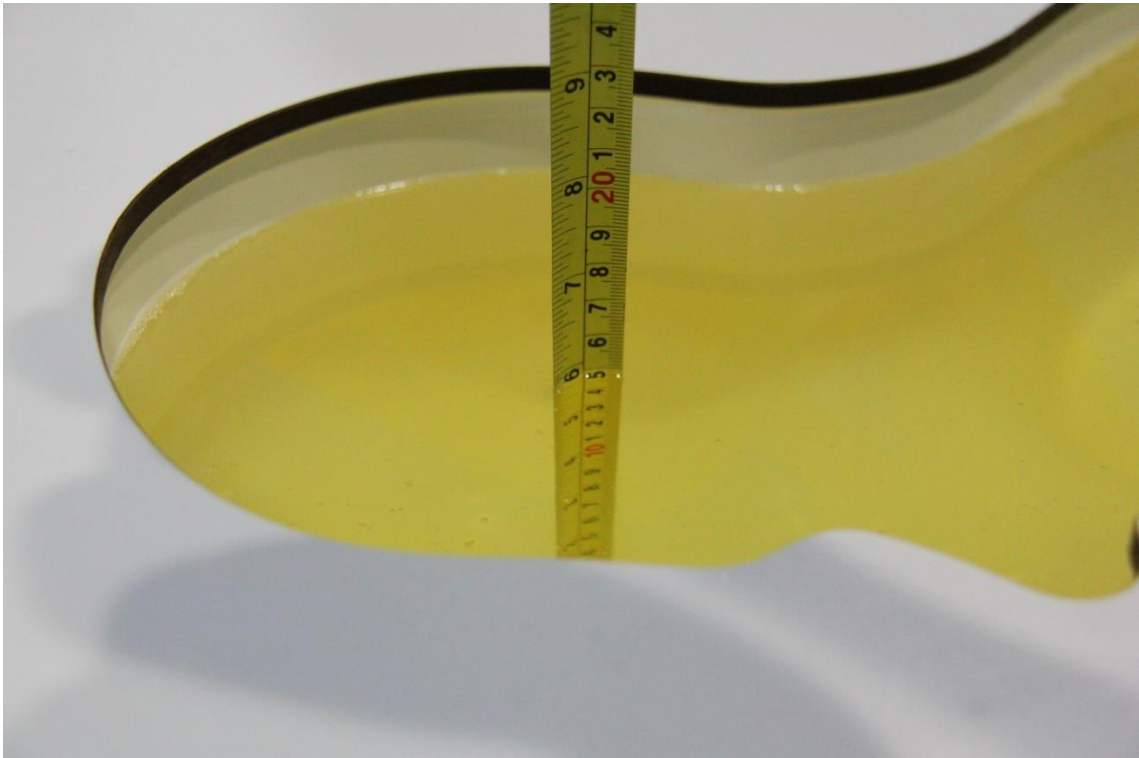
Picture 7-6: Liquid depth in the Flat Phantom (1800MHz)



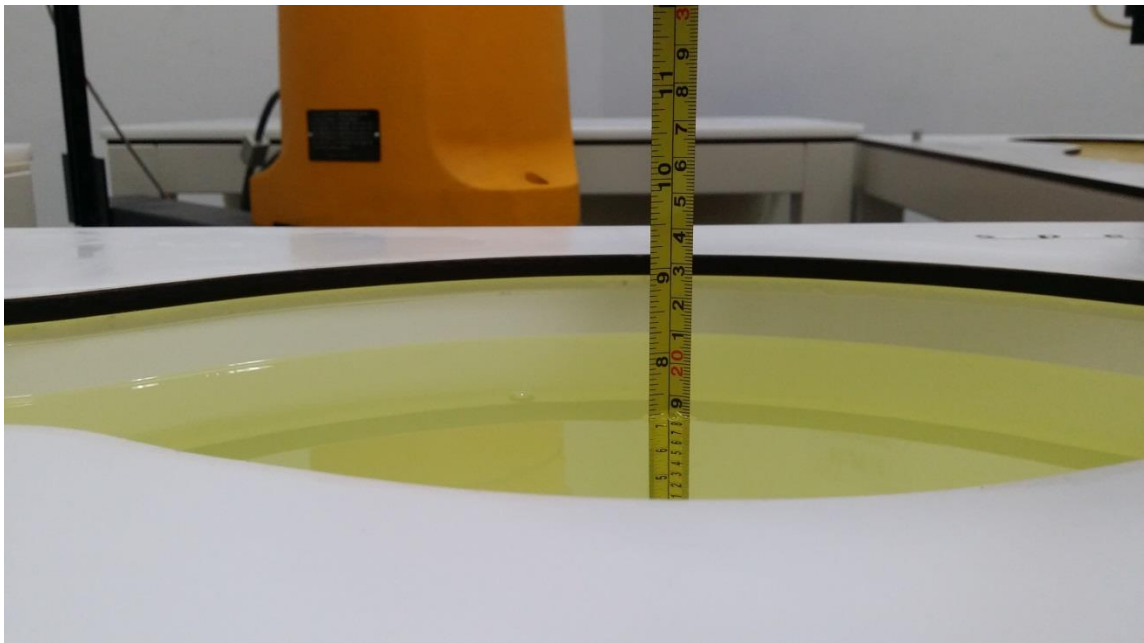
Picture 7-7: Liquid depth in the Head Phantom (1900 MHz)



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)



Picture 7-11: Liquid depth in the Head Phantom(2550MHz)

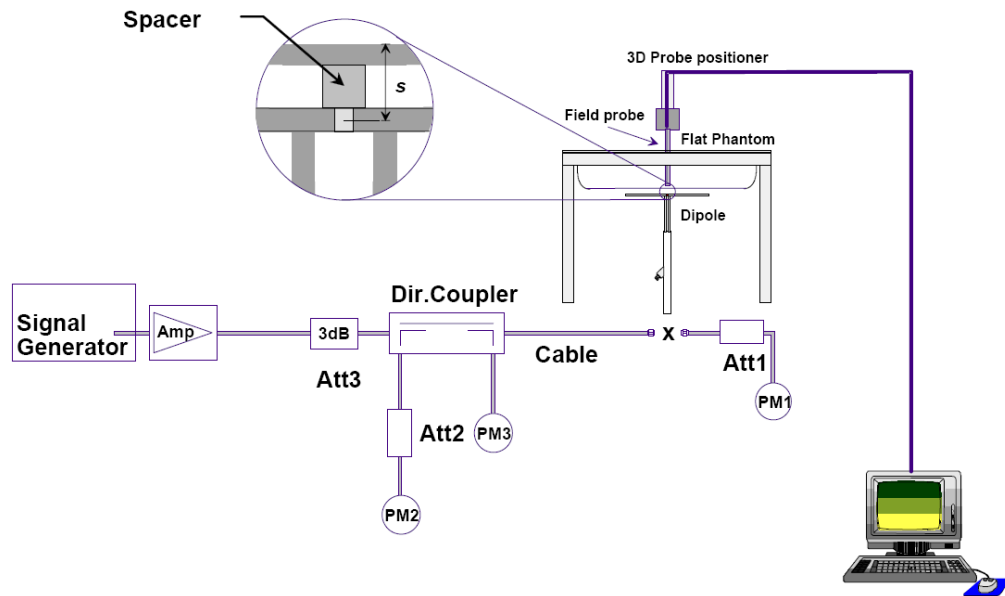


Picture 7-12: Liquid depth in the Flat Phantom(2550MHz)

8 System verification

8.1 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

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

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

Table 8.1: System Verification of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation (%)	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2017-2-22	750 MHz	5.43	8.26	5.60	8.64	3.13	4.60
2017-2-18	835 MHz	6.03	9.22	5.92	9.00	-1.82	-2.39
2017-2-13	1800 MHz	20.6	38.8	20.36	37.92	-1.17	-2.27
2017-2-12	1900 MHz	21.0	40.8	21.44	42.00	2.10	2.94
2017-2-15	2450 MHz	24.1	52.5	23.52	50.80	-2.41	-3.24
2017-3-15	2550 MHz	26.2	57.2	25.88	55.2	-1.22	-3.50

Table 8.2: System Verification of Body

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation (%)	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2017-2-22	750 MHz	5.64	8.58	5.68	8.56	0.71	-0.23
2017-2-18	835 MHz	6.20	9.44	6.04	9.12	-2.58	-3.39
2017-2-13	1800 MHz	21.1	39.6	20.52	38.60	-2.75	-2.53
2017-2-12	1900 MHz	21.3	41.1	22.04	42.40	3.47	3.16
2017-2-15	2450 MHz	24.4	52.3	23.52	50.40	-3.61	-3.63
2017-3-15	2550 MHz	25.1	54.8	25.84	57.20	2.95	4.38

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.

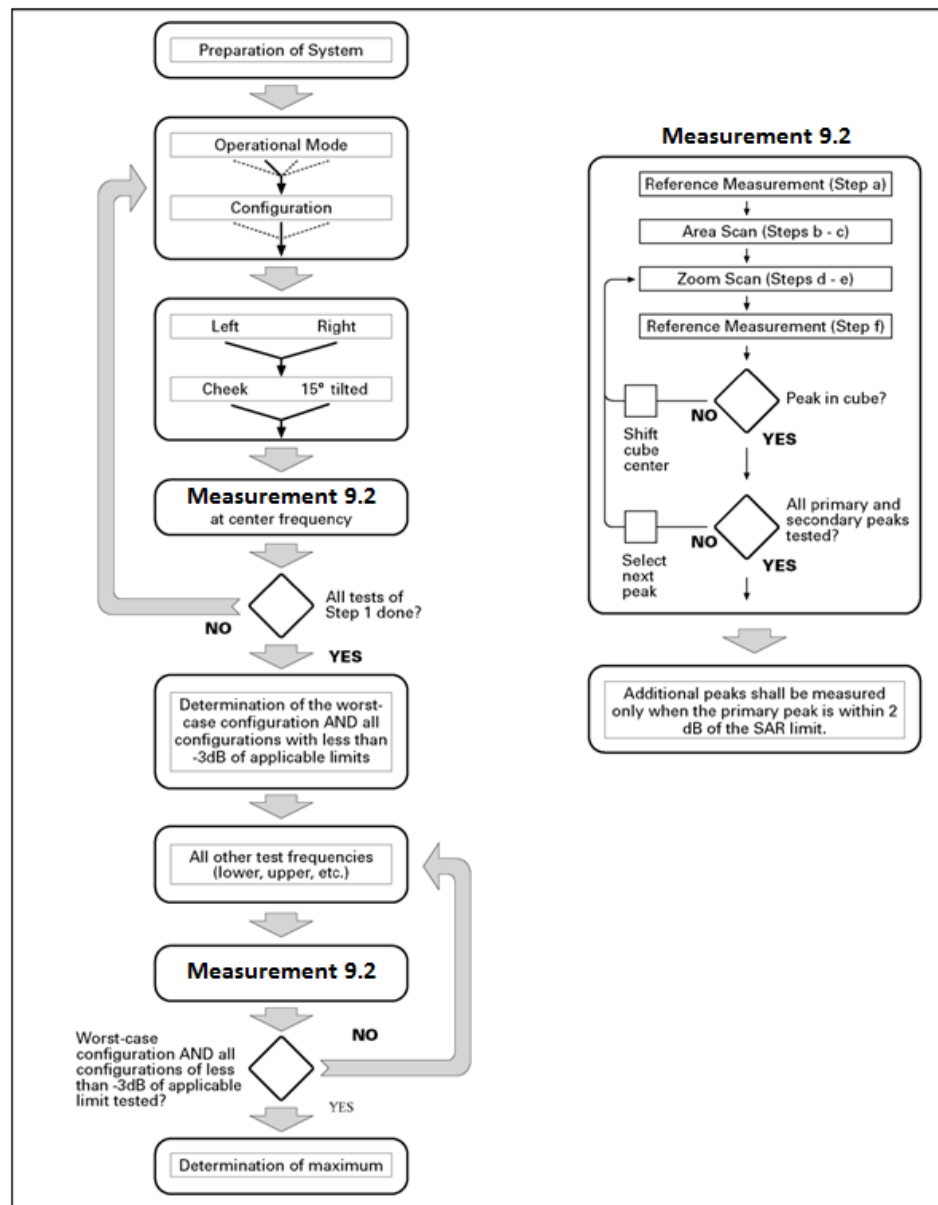
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the center of the transmit frequency band (f_c) for:

- 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.

			$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			$5 \pm 1 \text{ mm}$	$\frac{1}{4} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location			$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}			$\leq 2 \text{ GHz}: \leq 15 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 12 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 12 \text{ mm}$ $4 - 6 \text{ GHz}: \leq 10 \text{ mm}$
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}			$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$
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 <i>I-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4 \text{ W/kg}$, $\leq 8 \text{ mm}$, $\leq 7 \text{ mm}$ and $\leq 5 \text{ mm}$ zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

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	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	12/15	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}:47/15$ $\beta_{ed2}:47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	3.0	2.0	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	1.0	0.0	21	81

9.4 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.

9.5 SAR Measurement for LTE

SAR tests for LTE are performed with a base station simulator, Anristu MT8820C. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. All powers were measured with the Anristu MT8820C. 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.

9.6 Power Drift

To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Section 14 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10 Area Scan Based 1-g SAR

10.1 Requirement of KDB

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

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

10.2 Fast SAR Algorithms

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

In the initial study, an approximation algorithm based on Linear fit was developed. The accuracy of the algorithm has been demonstrated across a broad frequency range (136-2450 MHz) and for both 1- and 10-g averaged SAR using a sample of 264 SAR measurements from 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 Manufacturing tolerance

Table 11.1: GSM Speech

GSM 850			
Channel	Channel 251	Channel 190	Channel 128
Target (dBm)	32	32	32
Tolerance $\pm$ (dB)	1	1	1
GSM 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	29	29	29
Tolerance $\pm$ (dB)	1	1	1

Table 11.2: GPRS & EGPRS

GSM 850 GPRS				
Channel		251	190	128
1Txslot	Target (dBm)	32	32	32
	Tolerance $\pm$ (dB)	1	1	1
2Txslots	Target (dBm)	31	31	31
	Tolerance $\pm$ (dB)	1	1	1
3Txslots	Target (dBm)	30	30	30
	Tolerance $\pm$ (dB)	1	1	1
4Txslots	Target (dBm)	28	28	28
	Tolerance $\pm$ (dB)	1	1	1
GSM 850 EGPRS (GMSK)				
Channel		251	190	128
1Txslot	Target (dBm)	31	31	31
	Tolerance $\pm$ (dB)	1	1	1
2Txslots	Target (dBm)	30	30	30
	Tolerance $\pm$ (dB)	1	1	1
3Txslots	Target (dBm)	29	29	29
	Tolerance $\pm$ (dB)	1	1	1
4Txslots	Target (dBm)	28	28	28
	Tolerance $\pm$ (dB)	1	1	1
GSM 850 EGPRS (8PSK)				
Channel		251	190	128
1Txslot	Target (dBm)	25	25	25
	Tolerance $\pm$ (dB)	1	1	1
2Txslots	Target (dBm)	24	24	24
	Tolerance $\pm$ (dB)	1	1	1

3Txslots	Target (dBm)	22	22	22
	Tolerance $\pm$ (dB)	1	1	1
4Txslots	Target (dBm)	21	21	21
	Tolerance $\pm$ (dB)	1	1	1
GSM 1900 GPRS				
Channel		810	661	512
1Txslot	Target (dBm)	29	29	29
	Tolerance $\pm$ (dB)	1	1	1
2Txslots	Target (dBm)	28	28	28
	Tolerance $\pm$ (dB)	1	1	1
3Txslots	Target (dBm)	26	26	26
	Tolerance $\pm$ (dB)	1	1	1
4Txslots	Target (dBm)	25	25	25
	Tolerance $\pm$ (dB)	1	1	1
GSM 1900 EGPRS (GMSK)				
Channel		810	661	512
1Txslot	Target (dBm)	28	28	28
	Tolerance $\pm$ (dB)	1	1	1
2Txslots	Target (dBm)	27	27	27
	Tolerance $\pm$ (dB)	1	1	1
3Txslots	Target (dBm)	25	25	25
	Tolerance $\pm$ (dB)	1	1	1
4Txslots	Target (dBm)	24	24	24
	Tolerance $\pm$ (dB)	1	1	1
GSM 1900 EGPRS (8PSK)				
Channel		810	661	512
1Txslot	Target (dBm)	24	24	24
	Tolerance $\pm$ (dB)	1	1	1
2Txslots	Target (dBm)	23	23	23
	Tolerance $\pm$ (dB)	1	1	1
3Txslots	Target (dBm)	21	21	21
	Tolerance $\pm$ (dB)	1	1	1
4Txslots	Target (dBm)	20	20	20
	Tolerance $\pm$ (dB)	1	1	1

Table 11.3: WCDMA

UMTS Band V		Conducted Power (dBm)		
		Channel 4233	Channel 4182	Channel 4132
CS	Target (dBm)	23	23	23
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 1	Target (dBm)	20	20	20
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 2	Target (dBm)	20	20	20
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 3	Target (dBm)	21	21	21
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 4	Target (dBm)	20	20	20
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 5	Target (dBm)	22	22	22
	Tolerance $\pm$ (dB)	1	1	1
HSDPA sub-test 1-4	Target (dBm)	22	22	22
	Tolerance $\pm$ (dB)	1	1	1
UMTS Band II		Conducted Power(dBm)		
		Channel 9538	Channel 9400	Channel 9262
CS	Target (dBm)	23	23	23
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 1	Target (dBm)	20	20	20
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 2	Target (dBm)	20	20	20
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 3	Target (dBm)	21	21	21
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 4	Target (dBm)	19.5	19.5	19.5
	Tolerance $\pm$ (dB)	1	1	1
HSUPA sub-test 5	Target (dBm)	22	22	22
	Tolerance $\pm$ (dB)	1	1	1
HSDPA sub-test 1-4	Target (dBm)	22	22	22
	Tolerance $\pm$ (dB)	1	1	1

Table 11.4: LTE

LTE Band 2			
Channel	Channel 19100	Channel 18900	Channel 18700
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 4			
Channel	Channel 20300	Channel 20175	Channel 20050
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 5			
Channel	Channel 20600	Channel 20525	Channel 20450
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 7			
Channel	Channel 21350	Channel 21100	Channel 20850
Target (dBm)	22.5	22.5	22.5
Tolerance $\pm$ (dB)	1	1	1
LTE Band 12			
Channel	Channel 23130	Channel 23095	Channel 23060
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 13			
Channel	Channel 23230		
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 17			
Channel	Channel 23800	Channel 23790	Channel 26140
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 25			
Channel	Channel 26590	Channel 26365	Channel 23230
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 26			
Channel	Channel 26965	Channel 26865	Channel 26775
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1
LTE Band 38			
Channel	Channel 38150	Channel 38000	Channel 37850
Target (dBm)	22	22	22
Tolerance $\pm$ (dB)	1	1	1

LTE MPR will follow up 3GPP setting as below:

Modulation	Channel bandwidth / Transmission bandwidth (NRB)						MPR (dB)
	1.4MHz	3.0MHz	5MHz	10MHz	15MHz	20MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
Modulation	Channel bandwidth / Transmission bandwidth (NRB)						MPR (dB)
	1.4MHz	3.0MHz	5MHz	10MHz	15MHz	20MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	2

Table 11.5: Bluetooth

Mode	Target (dBm)	Tolerance ±(dB)
GFSK	5	1
EDR2M-4_DQPSK	6	1
EDR3M-8DPSK	4	1
GFSK(BLE)	-1	1

Table 11.6: Wi-Fi

Mode	Channel/Data rate	Target (dBm)	Tolerance ±(dB)
802.11 b (2.4GHz)	1-11Mbps	16	1
802.11 g (2.4GHz)	6-54Mbps	12.25	1
802.11 n (2.4GHz HT20)	MCS0-7	11	1

11.2 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 11.7: The conducted power measurement results for GSM850/1900

GSM 850MHz	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	32.04	31.99	31.93
GSM 1900MHz	Conducted Power(dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	29.04	28.98	28.70

Table 11.8: The conducted power measurement results for GPRS and EGPRS

GSM 850		Measured Power (dBm)			calculation	Average Power (dBm)		
		251	190	128		251	190	128
GPRS	1Txslots	32.07	32.02	31.95	-9.03dB	23.04	22.99	22.92
	2Txslots	31.42	31.38	31.30	-6.02dB	25.40	25.36	25.28
	3Txslots	29.76	29.69	29.60	-4.26dB	25.50	25.43	25.34
	4Txslots	28.71	28.67	28.61	-3.01dB	25.70	25.66	25.60
EGPRS (GMSK)	1Txslots	31.45	31.40	31.33	-9.03dB	22.42	22.37	22.30
	2Txslots	30.84	30.78	30.68	-6.02dB	24.82	24.76	24.66
	3Txslots	29.21	29.14	29.04	-4.26dB	24.95	24.88	24.78
	4Txslots	28.17	28.11	28.05	-3.01dB	25.16	25.10	25.04
EGPRS (8PSK)	1Txslots	25.21	25.45	25.59	-9.03dB	16.18	16.42	16.56
	2Txslots	24.15	24.37	24.57	-6.02dB	18.13	18.35	18.55
	3Txslots	22.12	22.33	22.49	-4.26dB	17.86	18.07	18.23
	4Txslots	20.90	21.12	21.28	-3.01dB	17.89	18.11	18.27
GSM 1900		Measured Power (dBm)			calculation	Average Power (dBm)		
		810	661	512		810	661	512
GPRS	1Txslots	29.04	28.97	28.68	-9.03dB	20.01	19.94	19.65
	2Txslots	28.29	28.18	27.93	-6.02dB	22.27	22.16	21.91
	3Txslots	26.54	26.47	26.20	-4.26dB	22.28	22.21	21.94
	4Txslots	25.51	25.43	25.13	-3.01dB	22.50	22.42	22.12
EGPRS (GMSK)	1Txslots	28.22	28.15	27.88	-9.03dB	19.19	19.12	18.85
	2Txslots	27.49	27.38	26.99	-6.02dB	21.47	21.36	20.97
	3Txslots	25.72	25.65	25.36	-4.26dB	21.46	21.39	21.10
	4Txslots	24.67	24.58	24.28	-3.01dB	21.66	21.57	21.27
EGPRS (8PSK)	1Txslots	24.01	24.29	24.50	-9.03dB	14.98	15.26	15.47
	2Txslots	22.97	23.30	24.35	-6.02dB	16.95	17.28	18.33
	3Txslots	20.87	21.16	21.33	-4.26dB	16.61	16.9	17.07
	4Txslots	19.78	20.04	20.20	-3.01dB	16.77	17.03	17.19

NOTES:

1) Division Factors

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

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

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

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

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

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

11.3 WCDMA Measurement result

Table 11.9: The conducted Power for WCDMA850/1700/1900

Item	band	FDD Band 5 result		
	ARFCN	4233 (846.6MHz)	4182(836.4MHz)	4132 (826.4MHz)
WCDMA	\	22.72	22.78	23.41
HSDPA	1	22.46	22.39	22.62
	2	22.47	22.35	22.60
	3	22.50	22.36	22.61
	4	22.48	22.48	22.61
HSUPA	1	20.44	20.44	20.58
	2	20.46	20.42	20.61
	3	21.41	21.35	21.57
	4	20.03	19.91	20.11
	5	22.53	22.35	22.62
Item	band	FDD Band 2 result		
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	\	22.75	22.94	22.72
HSDPA	1	22.18	22.18	22.06
	2	22.22	22.17	22.07
	3	22.20	22.18	22.07
	4	22.19	22.21	22.09
HSUPA	1	20.21	20.16	20.01
	2	20.28	20.16	20.05
	3	21.19	21.30	21.04
	4	19.63	19.79	19.57
	5	22.13	22.23	22.04

11.4 LTE_FDD Measurement result

Table 11.10: The conducted Power for LTE-FDD

LTE-FDD Band 2				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
1.4 MHz				1909.3MHz	1880MHz	1850.7MHz
	1RB	High	QPSK	22.53	22.22	22.48
			16QAM	21.81	21.51	21.65
		Middle	QPSK	22.63	22.29	22.37
			16QAM	21.94	21.60	21.69
		Low	QPSK	22.53	22.20	22.42
			16QAM	21.84	21.51	21.62
	3RB	High	QPSK	22.63	22.32	22.44
			16QAM	21.65	21.31	21.51
		Middle	QPSK	22.59	22.25	22.40
			16QAM	21.63	21.26	21.48
		Low	QPSK	22.63	22.30	22.41
			16QAM	21.66	21.31	21.50
	6RB	/	QPSK	21.67	21.26	21.58
			16QAM	20.75	20.40	20.65
3 MHz				1908.5MHz	1880MHz	1851.5MHz
	1RB	High	QPSK	22.51	22.17	22.50
			16QAM	21.82	21.46	21.65
		Middle	QPSK	22.57	22.23	22.46
			16QAM	21.89	21.52	21.67
		Low	QPSK	22.51	22.19	22.46
			16QAM	21.84	21.48	21.60
	8RB	High	QPSK	21.65	21.25	21.58
			16QAM	20.73	20.37	20.60
		Middle	QPSK	21.64	21.25	21.59
			16QAM	20.74	20.38	20.61
		Low	QPSK	21.64	21.27	21.59
			16QAM	20.74	20.40	20.60
	15RB	/	QPSK	21.65	21.25	21.62
			16QAM	20.69	20.33	20.61

5 MHz				1907.5MHz	1880MHz	1852.5MHz
	1RB	High	QPSK	22.55	22.23	22.53
			16QAM	21.87	21.54	21.72
		Middle	QPSK	22.29	22.25	22.26
			16QAM	21.61	21.56	21.64
		Low	QPSK	22.54	22.27	22.56
			16QAM	21.82	21.58	21.70
	12RB	High	QPSK	21.50	21.30	21.49
			16QAM	20.59	20.38	20.62
		Middle	QPSK	21.29	21.29	21.43
			16QAM	20.39	20.38	20.59
		Low	QPSK	21.29	21.30	21.53
16QAM			20.39	20.39	20.61	
25RB	/	QPSK	21.35	21.24	21.48	
		16QAM	20.46	20.30	20.58	
10 MHz				1905MHz	1880MHz	1855MHz
	1RB	High	QPSK	22.32	22.21	22.27
			16QAM	21.56	21.52	21.60
		Middle	QPSK	21.96	22.24	22.41
			16QAM	21.31	21.56	21.75
		Low	QPSK	21.82	22.29	22.06
			16QAM	21.13	21.61	21.37
	25RB	High	QPSK	21.22	21.24	21.49
			16QAM	20.31	20.31	20.55
		Middle	QPSK	21.00	21.24	21.53
			16QAM	20.30	20.30	20.57
		Low	QPSK	20.93	21.26	21.51
			16QAM	20.31	20.33	20.61
	50RB	/	QPSK	21.10	21.27	21.53
			16QAM	20.38	20.34	20.60

15 MHz				1902.5MHz	1880MHz	1857.5MHz
	1RB	High	QPSK	22.24	22.29	22.58
			16QAM	21.41	21.62	21.81
		Middle	QPSK	22.36	22.29	22.52
			16QAM	21.58	21.60	21.77
		Low	QPSK	22.41	22.34	22.41
			16QAM	21.71	21.66	21.69
	36RB	High	QPSK	22.30	22.35	22.60
			16QAM	21.24	21.39	21.61
		Middle	QPSK	22.39	22.36	22.57
			16QAM	21.34	21.38	21.58
		Low	QPSK	22.46	22.37	22.53
			16QAM	21.48	21.39	21.56
	75RB	/	QPSK	21.34	21.30	21.62
16QAM			20.39	20.37	20.64	
20 MHz				1900MHz	1880MHz	1860MHz
	1RB	High	QPSK	22.50	22.22	22.26
			16QAM	21.88	21.51	21.56
		Middle	QPSK	22.40	22.22	22.46
			16QAM	21.60	21.54	21.73
		Low	QPSK	22.32	22.35	22.64
			16QAM	21.63	21.64	21.76
	50RB	High	QPSK	21.54	21.22	21.39
			16QAM	20.34	20.30	20.46
		Middle	QPSK	21.44	21.21	21.49
			16QAM	20.44	20.30	20.55
		Low	QPSK	21.40	21.27	21.60
			16QAM	20.49	20.36	20.62
	100RB	/	QPSK	21.43	21.23	21.48
			16QAM	20.50	20.30	20.52

LTE-FDD Band 4				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
1.4 MHz				1754.3MHz	1732.5MHz	1710.7MHz
	1RB	High	QPSK	21.96	22.52	22.74
			16QAM	21.24	21.69	21.87
		Middle	QPSK	21.86	22.59	22.80
			16QAM	21.17	21.75	21.92
		Low	QPSK	21.99	22.54	22.74
			16QAM	21.33	21.70	21.85
	3RB	High	QPSK	21.92	22.64	22.84
			16QAM	20.99	21.58	21.73
		Middle	QPSK	21.86	22.60	22.81
			16QAM	21.01	21.56	21.70
		Low	QPSK	21.94	22.65	22.84
			16QAM	21.06	21.59	21.74
	6RB	/	QPSK	21.05	21.61	21.81
			16QAM	20.30	20.64	20.82
3 MHz				1753.5MHz	1732.5MHz	1711.5MHz
	1RB	High	QPSK	21.93	22.48	22.68
			16QAM	21.22	21.65	21.80
		Middle	QPSK	21.95	22.56	22.78
			16QAM	21.23	21.74	21.89
		Low	QPSK	22.18	22.51	22.71
			16QAM	21.54	21.68	21.83
	8RB	High	QPSK	21.13	21.59	21.79
			16QAM	20.30	20.62	20.79
		Middle	QPSK	21.17	21.60	21.81
			16QAM	20.35	20.62	20.80
		Low	QPSK	21.28	21.61	21.81
			16QAM	20.48	20.64	20.80
	15RB	/	QPSK	21.18	21.60	21.81
			16QAM	20.35	20.58	20.77

5 MHz				1752.5MHz	1732.5MHz	1712.5MHz
	1RB	High	QPSK	21.87	22.53	22.75
			16QAM	21.18	21.73	21.87
		Middle	QPSK	21.73	22.41	22.80
			16QAM	21.07	21.76	21.91
		Low	QPSK	22.55	22.52	22.79
			16QAM	21.72	21.76	21.91
	12RB	High	QPSK	20.88	21.62	21.81
			16QAM	20.39	20.59	20.76
		Middle	QPSK	21.00	21.61	21.83
			16QAM	20.19	20.61	20.78
		Low	QPSK	21.33	21.58	21.84
16QAM			20.52	20.62	20.79	
25RB	/	QPSK	21.08	21.58	21.79	
		16QAM	20.36	20.56	20.74	
10 MHz				1750MHz	1732.5MHz	1715MHz
	1RB	High	QPSK	21.41	22.55	21.91
			16QAM	20.72	21.72	21.32
		Middle	QPSK	22.23	22.44	22.74
			16QAM	21.56	21.77	21.90
		Low	QPSK	22.69	21.82	22.84
			16QAM	21.84	21.24	21.95
	25RB	High	QPSK	21.00	21.58	21.60
			16QAM	20.37	20.54	20.71
		Middle	QPSK	21.53	21.61	21.80
			16QAM	20.57	20.58	20.75
		Low	QPSK	21.67	21.38	21.83
			16QAM	20.63	20.60	20.78
	50RB	/	QPSK	21.61	21.60	21.80
			16QAM	20.61	20.59	20.76

15 MHz				1747.5MHz	1732.5MHz	1717.5MHz
	1RB	High	QPSK	22.68	22.30	22.81
			16QAM	21.83	21.65	21.91
		Middle	QPSK	22.68	22.00	22.83
			16QAM	21.84	21.39	21.93
		Low	QPSK	22.68	22.02	22.86
			16QAM	21.84	21.40	21.95
	36RB	High	QPSK	22.75	22.18	22.88
			16QAM	21.64	21.34	21.78
		Middle	QPSK	22.75	22.06	22.89
			16QAM	21.64	21.22	21.77
		Low	QPSK	22.76	22.04	22.90
16QAM			21.64	21.20	21.77	
75RB	/	QPSK	21.69	21.20	21.84	
		16QAM	20.65	20.42	20.78	
20 MHz				1745MHz	1732.5MHz	1720MHz
	1RB	High	QPSK	21.88	22.60	21.97
			16QAM	20.99	21.74	21.32
		Middle	QPSK	22.63	22.58	22.20
			16QAM	21.77	21.76	21.55
		Low	QPSK	22.63	22.30	22.86
			16QAM	21.82	21.61	21.96
	50RB	High	QPSK	21.60	21.60	21.17
			16QAM	20.59	20.58	20.30
		Middle	QPSK	21.66	21.62	21.55
			16QAM	20.64	20.61	20.73
		Low	QPSK	21.67	21.50	21.85
			16QAM	20.67	20.61	20.82
	100RB	/	QPSK	21.62	21.61	21.77
			16QAM	20.59	20.58	20.74

LTE-FDD Band 5				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
1.4 MHz				848.3MHz	836.5MHz	824.7MHz
	1RB	High	QPSK	22.17	22.47	22.50
			16QAM	21.52	21.88	21.81
		Middle	QPSK	22.24	22.56	22.57
			16QAM	21.61	21.99	21.86
		Low	QPSK	22.14	22.48	22.49
			16QAM	21.46	21.90	21.76
	3RB	High	QPSK	22.25	22.56	22.58
			16QAM	21.33	21.66	21.60
		Middle	QPSK	22.20	22.52	22.54
			16QAM	21.27	21.66	21.58
		Low	QPSK	22.23	22.57	22.57
			16QAM	21.31	21.70	21.60
	6RB	/	QPSK	21.28	21.59	21.59
			16QAM	20.40	20.73	20.67
3 MHz				847.5MHz	836.5MHz	825.5MHz
	1RB	High	QPSK	22.14	22.43	22.49
			16QAM	21.51	21.85	21.77
		Middle	QPSK	22.16	22.52	22.54
			16QAM	21.51	21.96	21.82
		Low	QPSK	22.11	22.47	22.47
			16QAM	21.39	21.89	21.76
	8RB	High	QPSK	21.27	21.60	21.62
			16QAM	20.40	20.73	20.69
		Middle	QPSK	21.27	21.65	21.62
			16QAM	20.38	20.76	20.69
		Low	QPSK	21.26	21.60	21.60
			16QAM	20.35	20.78	20.66
	15RB	/	QPSK	21.24	21.63	21.61
			16QAM	20.34	20.70	20.64

5 MHz				846.5MHz	836.5MHz	826.5MHz
	1RB	High	QPSK	22.19	22.47	22.56
			16QAM	21.57	21.87	21.89
		Middle	QPSK	22.19	22.53	22.58
			16QAM	21.53	21.96	21.87
		Low	QPSK	22.30	22.54	22.56
			16QAM	21.61	21.94	21.81
	12RB	High	QPSK	21.33	21.65	21.71
			16QAM	20.39	20.71	20.74
		Middle	QPSK	21.33	21.65	21.66
			16QAM	20.36	20.73	20.68
		Low	QPSK	21.36	21.69	21.66
16QAM			20.39	20.78	20.68	
25RB	/	QPSK	21.27	21.58	21.62	
		16QAM	20.30	20.65	20.64	
10 MHz				844MHz	836.5MHz	829MHz
	1RB	High	QPSK	22.23	22.48	22.59
			16QAM	21.62	21.84	21.99
		Middle	QPSK	22.35	22.56	22.62
			16QAM	21.65	21.97	21.90
		Low	QPSK	22.50	22.59	22.56
			16QAM	21.90	21.94	21.87
	25RB	High	QPSK	21.31	21.55	21.62
			16QAM	20.33	20.60	20.70
		Middle	QPSK	21.42	21.59	21.66
			16QAM	20.43	20.66	20.68
		Low	QPSK	21.50	21.63	21.64
			16QAM	20.51	20.70	20.63
	50RB	/	QPSK	21.43	21.59	21.68
			16QAM	20.46	20.64	20.69

LTE-FDD Band 7				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
5 MHz				2567.5MHz	2535MHz	2502.5MHz
	1RB	High	QPSK	21.30	22.93	22.71
			16QAM	20.50	22.12	21.88
		Middle	QPSK	21.21	22.91	22.58
			16QAM	20.43	22.15	21.88
		Low	QPSK	22.07	22.91	22.81
			16QAM	21.34	22.09	21.96
	12RB	High	QPSK	20.34	22.06	21.84
			16QAM	20.31	21.04	20.84
		Middle	QPSK	20.42	22.05	21.83
			16QAM	20.46	21.04	20.85
		Low	QPSK	20.75	22.02	21.91
			16QAM	20.35	21.01	20.86
	25RB	/	QPSK	20.48	22.02	21.87
			16QAM	20.38	20.99	20.83
10 MHz				2565MHz	2535MHz	2505MHz
	1RB	High	QPSK	21.10	22.89	22.74
			16QAM	20.36	22.11	21.99
		Middle	QPSK	21.90	23.01	22.74
			16QAM	21.09	22.21	21.98
		Low	QPSK	22.53	22.95	22.70
			16QAM	21.72	22.14	21.98
	25RB	High	QPSK	20.67	22.11	21.89
			16QAM	20.35	21.07	20.84
		Middle	QPSK	21.12	22.08	21.92
			16QAM	20.33	21.04	20.86
		Low	QPSK	21.50	22.05	21.94
			16QAM	20.51	21.02	20.87
	50RB	/	QPSK	21.12	22.12	21.95
			16QAM	20.36	21.08	20.90

15 MHz				2562.5MHz	2535MHz	2507.5MHz
	1RB	High	QPSK	22.97	23.09	22.93
			16QAM	22.12	22.28	22.10
		Middle	QPSK	22.99	23.01	22.92
			16QAM	22.16	22.20	22.05
		Low	QPSK	23.07	22.98	22.94
			16QAM	22.23	22.19	22.07
	36RB	High	QPSK	23.02	23.13	22.99
			16QAM	21.98	22.07	21.92
		Middle	QPSK	23.05	23.08	22.98
			16QAM	22.01	22.03	21.90
		Low	QPSK	23.09	23.05	22.98
			16QAM	22.05	22.02	21.90
	75RB	/	QPSK	22.09	22.11	22.04
16QAM			21.07	21.05	20.95	
20 MHz				2560MHz	2535MHz	2510MHz
	1RB	High	QPSK	22.86	23.32	23.05
			16QAM	21.47	22.54	22.29
		Middle	QPSK	23.07	23.16	22.96
			16QAM	22.26	22.37	22.15
		Low	QPSK	23.22	23.04	23.07
			16QAM	22.45	22.25	22.18
	50RB	High	QPSK	22.09	22.34	22.11
			16QAM	21.06	21.31	21.04
		Middle	QPSK	22.19	22.25	22.09
			16QAM	21.18	21.21	21.01
		Low	QPSK	22.30	22.19	22.12
			16QAM	21.29	21.15	21.04
	100RB	/	QPSK	22.18	22.23	22.09
			16QAM	21.15	21.19	21.02

LTE-FDD Band 12				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
1.4 MHz				715.3MHz	707.5MHz	699.7MHz
	1RB	High	QPSK	22.66	22.49	22.81
			16QAM	22.00	21.86	22.16
		Middle	QPSK	22.72	22.57	22.85
			16QAM	22.06	21.96	22.21
		Low	QPSK	22.63	22.48	22.78
			16QAM	21.95	21.85	22.14
	3RB	High	QPSK	22.76	22.59	22.90
			16QAM	21.84	21.69	21.96
		Middle	QPSK	22.72	22.54	22.84
			16QAM	21.79	21.66	21.94
		Low	QPSK	22.75	22.60	22.89
			16QAM	21.82	21.71	21.99
	6RB	/	QPSK	21.80	21.61	21.93
			16QAM	20.91	20.71	21.03
3 MHz				714.5MHz	707.5MHz	700.5MHz
	1RB	High	QPSK	22.64	22.47	23.20
			16QAM	21.99	21.87	22.52
		Middle	QPSK	22.65	22.51	22.93
			16QAM	21.96	21.89	22.30
		Low	QPSK	22.78	22.46	22.75
			16QAM	22.10	21.86	22.12
	8RB	High	QPSK	21.79	21.63	22.20
			16QAM	20.91	20.74	21.31
		Middle	QPSK	21.77	21.63	22.06
			16QAM	20.87	20.74	21.16
		Low	QPSK	21.81	21.63	21.97
			16QAM	20.91	20.74	21.07
	15RB	/	QPSK	21.80	21.60	22.08
			16QAM	20.84	20.65	21.11

5 MHz				713.5MHz	707.5MHz	701.5MHz
	1RB	High	QPSK	22.69	22.54	22.63
			16QAM	22.05	21.93	22.01
		Middle	QPSK	22.81	22.53	22.86
			16QAM	22.14	21.93	22.28
		Low	QPSK	22.53	22.52	22.78
			16QAM	21.90	21.90	22.15
	12RB	High	QPSK	21.84	21.66	21.93
			16QAM	20.90	20.71	21.08
		Middle	QPSK	21.91	21.66	21.99
			16QAM	20.95	20.70	21.20
		Low	QPSK	21.85	21.65	22.05
			16QAM	20.89	20.69	21.09
	25RB	/	QPSK	21.77	21.60	22.00
16QAM			20.80	20.64	21.05	
10 MHz				711MHz	707.5MHz	704MHz
	1RB	High	QPSK	22.69	22.68	22.62
			16QAM	22.08	22.03	21.97
		Middle	QPSK	22.60	22.55	22.62
			16QAM	21.97	21.94	22.01
		Low	QPSK	22.52	22.62	22.78
			16QAM	21.90	21.96	22.15
	25RB	High	QPSK	21.88	21.67	21.67
			16QAM	20.87	20.68	20.68
		Middle	QPSK	21.74	21.63	21.78
			16QAM	20.73	20.64	20.85
		Low	QPSK	21.62	21.64	21.94
			16QAM	20.61	20.65	21.00
	50RB	/	QPSK	21.75	21.69	21.85
			16QAM	20.75	20.69	20.86

LTE-FDD Band 13				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
5 MHz				784.5MHz	782MHz	779.5MHz
	1RB	High	QPSK	22.50	22.30	22.24
			16QAM	21.81	21.66	21.49
		Middle	QPSK	22.33	22.32	22.33
			16QAM	21.62	21.62	21.69
		Low	QPSK	22.29	22.26	22.34
			16QAM	21.59	21.62	21.53
	12RB	High	QPSK	21.64	21.40	21.39
			16QAM	20.69	20.44	20.40
		Middle	QPSK	21.48	21.37	21.41
			16QAM	20.55	20.39	20.40
		Low	QPSK	21.44	21.37	21.43
			16QAM	20.54	20.38	20.44
	25RB	/	QPSK	21.48	21.36	21.35
			16QAM	20.56	20.38	20.33
10 MHz				782MHz	782MHz	782MHz
	1RB	High	QPSK	22.49	22.51	22.53
			16QAM	21.85	21.83	21.85
		Middle	QPSK	22.28	22.28	22.29
			16QAM	21.55	21.56	21.57
		Low	QPSK	22.29	22.30	22.31
			16QAM	21.57	21.58	21.58
	25RB	High	QPSK	21.46	21.47	21.48
			16QAM	20.55	20.55	20.55
		Middle	QPSK	21.33	21.33	21.34
			16QAM	20.37	20.38	20.38
		Low	QPSK	21.32	21.32	21.33
			16QAM	20.30	20.31	20.31
	50RB	/	QPSK	21.43	21.38	21.38
			16QAM	20.47	20.47	20.47

LTE-FDD Band 17				Actual output Power (dBm)		
Band-width	RB allocation	RB offset	Modulation	High	Middle	Low
5 MHz				713.5MHz	710MHz	706.5MHz
	1RB	High	QPSK	22.54	22.45	22.39
			16QAM	21.92	21.81	21.77
		Middle	QPSK	22.52	22.43	22.95
			16QAM	21.87	21.83	22.26
		Low	QPSK	22.42	22.38	22.47
			16QAM	21.82	21.77	21.86
	12RB	High	QPSK	21.73	21.62	21.71
			16QAM	20.77	20.64	20.75
		Middle	QPSK	21.65	21.56	21.94
			16QAM	20.67	20.58	20.98
		Low	QPSK	21.61	21.54	21.77
			16QAM	20.64	20.58	20.81
	25RB	/	QPSK	21.60	21.50	21.67
			16QAM	20.61	20.52	20.70
10 MHz				711MHz	710MHz	709MHz
	1RB	High	QPSK	22.61	22.59	22.55
			16QAM	21.98	21.94	21.90
		Middle	QPSK	22.46	22.43	22.42
			16QAM	21.85	21.84	21.81
		Low	QPSK	22.94	22.61	22.44
			16QAM	22.32	22.01	21.85
	25RB	High	QPSK	21.63	21.58	21.55
			16QAM	20.63	20.59	20.56
		Middle	QPSK	21.53	21.50	21.55
			16QAM	20.54	20.51	20.57
		Low	QPSK	21.56	21.65	21.66
			16QAM	20.58	20.65	20.69
	50RB	/	QPSK	21.60	21.64	21.63
			16QAM	20.61	20.65	20.64

LTE-FDD Band 25				Actual output Power (dBm)		
Bandwidth	RB allocation	RB offset	Modulation	High	Middle	Low
1.4 MHz				1914.3MHz	1882,5MHz	1850.7MHz
	1RB	High	QPSK	21.90	22.11	22.46
			16QAM	21.16	21.35	21.50
		Middle	QPSK	21.93	22.17	22.48
			16QAM	21.24	21.37	21.55
		Low	QPSK	22.23	22.11	22.46
			16QAM	21.34	21.35	21.49
	3RB	High	QPSK	21.88	22.19	22.53
			16QAM	21.03	21.14	21.39
		Middle	QPSK	22.00	22.17	22.49
			16QAM	21.15	21.13	21.37
		Low	QPSK	22.09	22.21	22.50
			16QAM	21.22	21.17	21.41
	6RB	/	QPSK	21.25	21.17	21.53
			16QAM	20.34	20.39	20.51
3 MHz				1913.5MHz	1882,5MHz	1851.5MHz
	1RB	High	QPSK	21.85	22.07	22.39
			16QAM	21.16	21.32	21.48
		Middle	QPSK	22.29	22.12	22.48
			16QAM	21.41	21.36	21.53
		Low	QPSK	22.35	22.09	22.45
			16QAM	21.46	21.32	21.47
	8RB	High	QPSK	21.32	21.14	21.50
			16QAM	20.33	20.34	20.49
		Middle	QPSK	21.37	21.15	21.51
			16QAM	20.37	20.34	20.49
		Low	QPSK	21.41	21.16	21.52
			16QAM	20.44	20.36	20.48
	15RB	/	QPSK	21.38	21.16	21.52
			16QAM	20.38	20.31	20.48

5 MHz				1912.5MHz	1882,5MHz	1852.5MHz
	1RB	High	QPSK	21.83	22.07	22.39
			16QAM	21.14	21.29	21.51
		Middle	QPSK	22.36	22.16	22.44
			16QAM	21.52	21.40	21.59
		Low	QPSK	22.49	22.17	22.52
			16QAM	21.66	21.40	21.53
	12RB	High	QPSK	21.25	21.17	21.51
			16QAM	20.35	20.32	20.49
		Middle	QPSK	21.44	21.19	21.53
			16QAM	20.45	20.34	20.49
		Low	QPSK	21.51	21.20	21.55
16QAM			20.52	20.35	20.49	
25RB		QPSK	21.43	21.17	21.51	
		16QAM	20.41	20.37	20.46	
10 MHz				1910MHz	1882,5MHz	1855MHz
	1RB	High	QPSK	21.46	22.14	22.35
			16QAM	20.79	21.36	21.53
		Middle	QPSK	22.52	22.16	22.48
			16QAM	21.71	21.40	21.61
		Low	QPSK	22.31	22.19	22.14
			16QAM	21.62	21.45	21.48
	25RB	High	QPSK	21.43	21.17	21.47
			16QAM	20.43	20.31	20.45
		Middle	QPSK	21.52	21.16	21.50
			16QAM	20.54	20.30	20.47
		Low	QPSK	21.55	21.19	21.56
			16QAM	20.59	20.32	20.50
	50RB	/	QPSK	21.52	21.20	21.51
			16QAM	20.55	20.34	20.49

15 MHz				1907.5MHz	1882,5MHz	1857.5MHz
	1RB	High	QPSK	22.48	22.21	22.54
			16QAM	21.70	21.46	21.70
		Middle	QPSK	22.28	22.21	22.53
			16QAM	21.51	21.46	21.64
		Low	QPSK	22.40	22.24	22.38
			16QAM	21.65	21.49	21.61
	36RB	High	QPSK	22.41	22.24	22.60
			16QAM	21.38	21.23	21.49
		Middle	QPSK	22.37	22.24	22.58
			16QAM	21.35	21.23	21.47
		Low	QPSK	22.40	22.27	22.55
			16QAM	21.39	21.26	21.47
	75RB	/	QPSK	21.33	21.20	21.58
16QAM			20.43	20.35	20.55	
20 MHz				1905MHz	1882,5MHz	1860MHz
	1RB	High	QPSK	21.93	22.15	22.18
			16QAM	21.18	21.37	21.42
		Middle	QPSK	22.42	22.13	22.39
			16QAM	21.67	21.39	21.59
		Low	QPSK	22.33	22.26	22.52
			16QAM	21.57	21.52	21.62
	50RB	High	QPSK	21.48	21.19	21.33
			16QAM	20.52	20.34	20.37
		Middle	QPSK	21.48	21.16	21.45
			16QAM	20.54	20.31	20.47
		Low	QPSK	21.43	21.22	21.55
			16QAM	20.50	20.36	20.55
	100RB	/	QPSK	21.44	21.19	21.42
			16QAM	20.49	20.32	20.43

LTE-FDD Band 26				Actual output Power (dBm)		
Bandwidth	RB allocation	RB offset	Modulation	High	Middle	Low
1.4 MHz				848.3MHz	831.5MHz	814.7MHz
	1RB	High	QPSK	22.15	22.50	22.41
			16QAM	21.47	21.83	21.70
		Middle	QPSK	22.18	22.55	22.45
			16QAM	21.55	21.89	21.75
		Low	QPSK	22.13	22.50	22.40
			16QAM	21.45	21.83	21.70
	3RB	High	QPSK	22.25	22.59	22.50
			16QAM	21.32	21.66	21.55
		Middle	QPSK	22.21	22.57	22.47
			16QAM	21.29	21.63	21.51
		Low	QPSK	22.25	22.60	22.50
			16QAM	21.32	21.67	21.56
	6RB	/	QPSK	21.30	21.65	21.53
			16QAM	20.41	20.76	20.62
3 MHz				847.5MHz	831.5MHz	815.5MHz
	1RB	High	QPSK	22.11	22.46	22.95
			16QAM	21.47	21.80	22.07
		Middle	QPSK	22.13	22.51	23.04
			16QAM	21.45	21.83	22.13
		Low	QPSK	22.11	22.47	22.99
			16QAM	21.41	21.76	22.06
	8RB	High	QPSK	21.27	21.63	22.05
			16QAM	20.39	20.76	21.07
		Middle	QPSK	21.26	21.64	22.07
			16QAM	20.37	20.76	21.08
		Low	QPSK	21.26	21.64	22.08
			16QAM	20.36	20.74	21.08
	15RB	/	QPSK	21.26	21.62	22.09
			16QAM	20.31	20.68	21.06

5 MHz				846.5MHz	831.5MHz	816.5MHz
	1RB	High	QPSK	22.13	22.45	22.41
			16QAM	21.47	21.83	21.77
		Middle	QPSK	22.19	22.55	22.46
			16QAM	21.49	21.89	21.80
		Low	QPSK	22.26	22.53	22.43
			16QAM	21.56	21.83	21.73
	12RB	High	QPSK	21.31	21.67	21.58
			16QAM	20.36	20.73	20.60
		Middle	QPSK	21.31	21.68	21.57
			16QAM	20.34	20.73	20.60
		Low	QPSK	21.33	21.68	21.56
			16QAM	20.34	20.72	20.59
	25RB		QPSK	21.28	21.63	21.52
16QAM			20.30	20.67	20.55	
10 MHz				844MHz	831.5MHz	820MHz
	1RB	High	QPSK	22.19	22.54	22.53
			16QAM	21.52	21.93	21.83
		Middle	QPSK	22.31	22.56	22.50
			16QAM	21.59	21.89	21.83
		Low	QPSK	22.54	22.56	22.45
			16QAM	21.90	21.83	21.77
	25RB	High	QPSK	21.29	21.62	21.57
			16QAM	20.32	20.68	20.58
		Middle	QPSK	21.37	21.64	21.55
			16QAM	20.38	20.69	20.56
		Low	QPSK	21.51	21.64	21.52
			16QAM	20.53	20.67	20.54
	50RB	/	QPSK	21.41	21.66	21.59
			16QAM	20.44	20.70	20.59

15 MHz				841.5MHz	831.5MHz	822.5MHz
	1RB	High	QPSK	22.60	22.62	22.55
			16QAM	21.98	21.92	21.84
		Middle	QPSK	22.59	22.59	22.49
			16QAM	21.96	21.87	21.81
		Low	QPSK	22.59	22.57	22.48
			16QAM	21.96	21.88	21.78
	36RB	High	QPSK	22.69	22.68	22.61
			16QAM	21.79	21.72	21.64
		Middle	QPSK	22.67	22.67	22.58
			16QAM	21.76	21.68	21.62
		Low	QPSK	22.68	22.64	22.55
			16QAM	21.76	21.65	21.60
	75RB	/	QPSK	21.66	21.69	21.57
			16QAM	20.73	20.68	20.57

LTE-TDD Band 38				Actual output Power (dBm)		
Bandwidth	RB allocation	RB offset	Modulation	High	Middle	Low
5 MHz				2617.5MHz	2595MHz	2572.5MHz
	1RB	High	QPSK	22.22	22.26	22.31
			16QAM	21.47	21.48	21.47
		Middle	QPSK	22.27	22.26	22.34
			16QAM	21.53	21.49	21.49
		Low	QPSK	22.17	22.25	22.32
			16QAM	21.51	21.44	21.46
	12RB	High	QPSK	21.39	21.34	21.37
			16QAM	20.51	20.48	20.40
		Middle	QPSK	21.38	21.31	21.39
			16QAM	20.53	20.48	20.42
		Low	QPSK	21.40	21.33	21.39
			16QAM	20.54	20.44	20.41
	25RB		QPSK	21.32	21.29	21.35
			16QAM	20.46	20.43	20.41
10 MHz				2615MHz	2595MHz	2575MHz
	1RB	High	QPSK	22.27	22.24	22.33
			16QAM	21.53	21.51	21.48
		Middle	QPSK	22.17	22.26	22.32
			16QAM	21.56	21.47	21.48
		Low	QPSK	22.19	22.25	22.35
			16QAM	21.45	21.44	21.50
	25RB	High	QPSK	21.30	21.34	21.38
			16QAM	20.56	20.45	20.41
		Middle	QPSK	21.26	21.32	21.39
			16QAM	20.50	20.42	20.42
		Low	QPSK	21.26	21.31	21.38
			16QAM	20.46	20.41	20.42
	50RB	/	QPSK	21.34	21.31	21.37
			16QAM	20.53	20.45	20.40

15 MHz				2612.5MHz	2595MHz	2577.5MHz
	1RB	High	QPSK	22.19	22.26	22.35
			16QAM	21.51	21.46	21.50
		Middle	QPSK	22.19	22.26	22.34
			16QAM	21.48	21.44	21.49
		Low	QPSK	22.19	22.27	22.35
			16QAM	21.50	21.47	21.50
	36RB	High	QPSK	22.26	22.31	22.37
			16QAM	21.43	21.38	21.37
		Middle	QPSK	22.24	22.31	22.36
			16QAM	21.39	21.34	21.37
		Low	QPSK	22.29	22.28	22.38
16QAM			21.41	21.31	21.41	
75RB		QPSK	21.31	21.33	21.40	
		16QAM	20.44	20.50	20.42	
20 MHz				2610MHz	2595MHz	2580MHz
	1RB	High	QPSK	22.28	22.29	22.30
			16QAM	21.56	21.57	21.51
		Middle	QPSK	22.18	22.26	22.33
			16QAM	21.52	21.46	21.48
		Low	QPSK	22.21	22.31	22.36
			16QAM	21.48	21.48	21.51
	50RB	High	QPSK	21.34	21.39	21.37
			16QAM	20.54	20.52	20.41
		Middle	QPSK	21.30	21.36	21.37
			16QAM	20.46	20.46	20.41
		Low	QPSK	21.33	21.36	21.42
			16QAM	20.49	20.45	20.44
	100RB	/	QPSK	21.27	21.38	21.40
			16QAM	20.39	20.50	20.41

11.5 Wi-Fi and BT Measurement result

The output power of BT antenna is as following:

Mode	Conducted Power (dBm)		
	Channel 0 (2402MHz)	Channel 39 (2441MHz)	Channel 78 (2480MHz)
GFSK	5.58	4.98	5.08
$\pi/4$ DQPSK	6.72	6.07	6.19
8DPSK	4.72	4.03	4.15
BLE	-1.08	-0.12	-1.96

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

802.11b (dBm)

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1(2412MHz)	16.08	16.06	16.15	16.12
6(2437MHz)	16.35	16.35	16.32	16.31
11(2462MHz)	15.60	15.61	15.81	15.76

802.11g (dBm)

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1(2412MHz)	12.00	12.03	12.11	12.17	11.92	11.79	12.04	12.08
6(2437MHz)	13.02	13.04	13.19	13.25	12.94	13.01	13.13	13.17
11(2462MHz)	11.39	11.41	11.54	11.62	11.40	11.29	11.54	11.58

802.11n (dBm) - HT20 (2.4G)

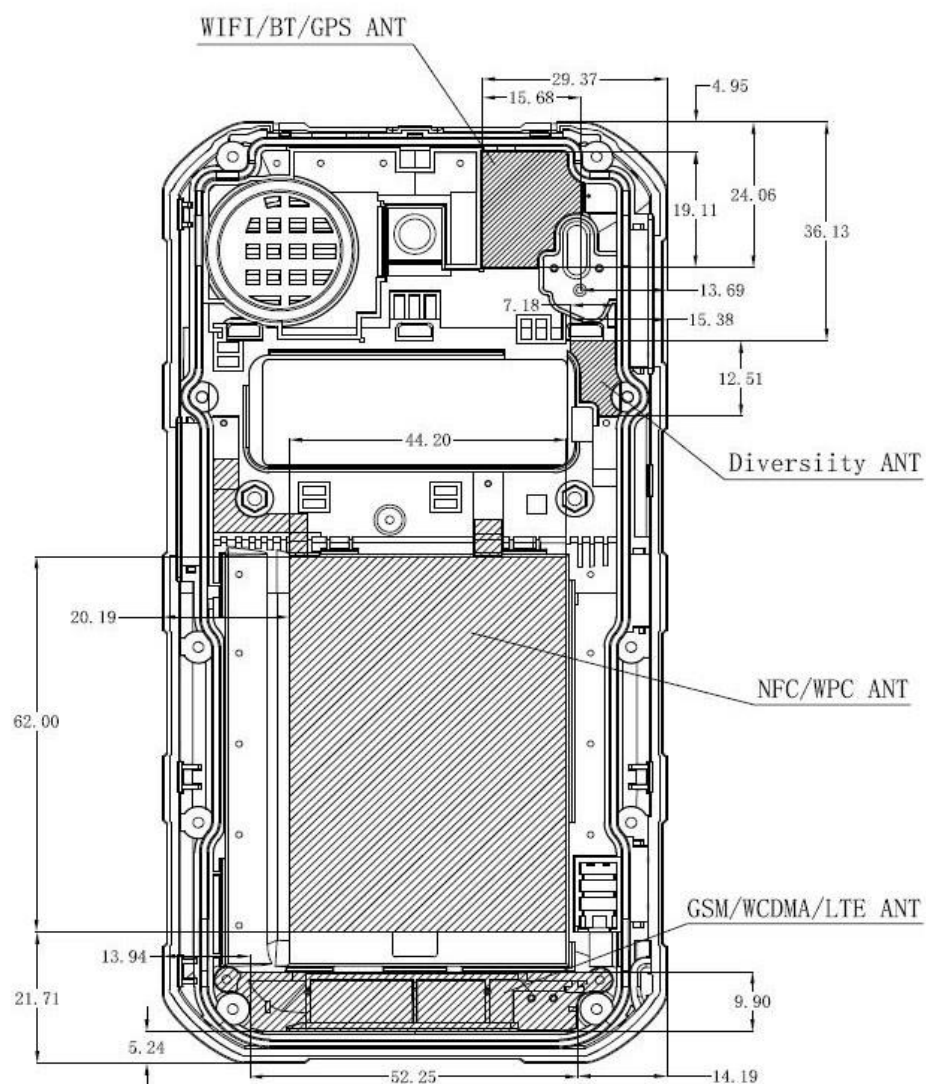
Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1(2412MHz)	10.96	11.01	11.06	11.08	10.94	11.17	11.19	11.01
6(2437MHz)	11.17	11.22	11.25	11.09	11.17	11.45	11.23	11.28
11(2462MHz)	10.54	10.62	10.46	10.50	10.41	10.60	10.63	10.67

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, 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	Yes	No	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:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR, where}$$

- $f(\text{GHz})$ 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	9.60	7	5.01	Yes
		Body	19.20	7	5.01	Yes
2.4GHz WLAN 802.11 b	2.45	Head	9.58	17	50.12	No
		Body	19.17	17	50.12	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 Touch	0.44	0.43	0.87
Highest reported SAR value for Body	Rear	0.79	0.17	0.96
	Bottom	1.16	/	1.16

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

	Position	Main antenna	BT*	Sum
Highest reported SAR value for Head	Right Touch	0.44	0.21	0.65
Highest reported SAR value for Body	Rear	0.79	0.12	0.91
	Bottom	1.16	/	1.16

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

Table 13.3: Estimated SAR for Bluetooth

Position	f (GHz)	Distance (mm)	Upper limit of power *		Estimated _{1g} (W/kg)
			dBm	mW	
Head	2.441	5	7	5.01	0.21
Body	2.441	10	7	5.01	0.12

* - 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) · [$\sqrt{f(\text{GHz})/x}$] 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 $< 1.6\text{W/kg}$. 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 >1.2W/kg.

The calculated SAR is obtained by the following formula:

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

Where P_{Target} is the power of manufacturing upper limit;

P_{Measured} is the measured power in chapter 11.

Table 14.1: Duty Cycle

Mode	Duty Cycle
Speech for GSM850/1900	1:8.3
GPRS&EGPRS for GSM850/1900	1:2
WCDMA850/1900	1:1
FDD_LTE Band 2/4/5/7/12/13/17/25/26	1:1
TDD_LTE Band 38	1:1.58

14.1 SAR results for Fast SAR

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

Ambient Temperature: 22.4.°C						Liquid Temperature: 22.0°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
836.6	190	Left	Touch	/	31.99	33	0.229	0.29	0.333	0.42	0.10
836.6	190	Left	Tilt	/	31.99	33	0.087	0.11	0.125	0.16	0.17
836.6	190	Right	Touch	/	31.99	33	0.218	0.28	0.283	0.36	0.04
836.6	190	Right	Tilt	/	31.99	33	0.089	0.11	0.127	0.16	0.08
848.8	251	Left	Touch	Fig.1	32.04	33	0.265	0.33	0.352	0.44	0.09
824.2	128	Left	Touch	/	31.93	33	0.224	0.29	0.325	0.42	0.02

Table 14.3: SAR Values (GSM 850 MHz -Body) -AP ON

Ambient Temperature: 22.2. °C						Liquid Temperature: 21.7 °C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
836.6	190	Front	/	28.67	29	0.414	0.45	0.598	0.65	0.17
836.6	190	Rear	/	28.67	29	0.340	0.37	0.490	0.53	-0.08
836.6	190	Left	/	28.67	29	0.262	0.28	0.386	0.42	0.07
836.6	190	Right	/	28.67	29	0.156	0.17	0.233	0.25	-0.12
836.6	190	Bottom	/	28.67	29	0.085	0.09	0.132	0.14	-0.08
848.8	251	Front	/	28.71	29	0.333	0.36	0.487	0.52	-0.11
824.2	128	Front	Fig.2	28.61	29	0.491	0.54	0.665	0.73	0.08
824.2	128	Front EGPRS	/	28.05	29	0.423	0.53	0.582	0.72	0.14

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

Table 14.4: SAR Values (GSM 850 MHz -Body) -AP OFF

Ambient Temperature: 22.2. °C						Liquid Temperature: 21.7 °C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
836.6	190	Front	/	28.67	29	0.414	0.45	0.598	0.65	0.17
836.6	190	Rear	/	28.67	29	0.340	0.37	0.490	0.53	-0.08
848.8	251	Front	/	28.71	29	0.333	0.36	0.487	0.52	-0.11
824.2	128	Front	/	28.61	29	0.491	0.54	0.665	0.73	0.08
824.2	128	Front EGPRS	/	28.05	29	0.423	0.53	0.582	0.72	0.14

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

Table 14.5: SAR Values (GSM 1900 MHz - Head)

Ambient Temperature: 22.2°C						Liquid Temperature: 21.7°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1880	661	Left	Touch	/	28.98	30	0.055	0.07	0.092	0.12	-0.14
1880	661	Left	Tilt	/	28.98	30	0.021	0.03	0.038	0.05	-0.02
1880	661	Right	Touch	Fig.3	28.98	30	0.060	0.08	0.100	0.13	-0.05
1880	661	Right	Tilt	/	28.98	30	0.021	0.03	0.040	0.05	-0.06
1909.8	810	Right	Touch	/	29.04	30	0.055	0.07	0.098	0.12	-0.05
1850.2	512	Right	Touch	/	28.70	30	0.051	0.07	0.088	0.12	0.11

Table 14.6: SAR Values (GSM 1900 MHz -Body) -AP ON

Ambient Temperature: 22.2°C					Liquid Temperature: 21.7°C					
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1880	661	Front	/	25.43	26	0.251	0.29	0.441	0.50	-0.12
1880	661	Rear	Fig.4	25.43	26	0.296	0.34	0.528	0.60	-0.08
1880	661	Left	/	25.43	26	0.043	0.05	0.073	0.08	0.05
1880	661	Right	/	25.43	26	0.076	0.09	0.126	0.14	0.02
1880	661	Bottom	/	25.43	26	0.206	0.23	0.373	0.43	0.12
1909.8	810	Rear	/	25.51	26	0.345	0.39	0.610	0.68	-0.08
1850.2	512	Rear	/	25.13	26	0.239	0.29	0.425	0.52	-0.13
1909.8	810	Rear EGPRS	/	24.67	26	0.326	0.44	0.492	0.67	-0.02

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

Table 14.7: SAR Values (GSM 1900 MHz -Body) -AP OFF

Ambient Temperature: 22.2°C					Liquid Temperature: 21.7°C					
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1880	661	Front	/	25.43	26	0.251	0.29	0.441	0.50	-0.12
1880	661	Rear	/	25.43	26	0.296	0.34	0.528	0.60	-0.08
1909.8	810	Rear	/	25.51	26	0.345	0.39	0.610	0.68	-0.08
1850.2	512	Rear	/	25.13	26	0.239	0.29	0.425	0.52	-0.13
1909.8	810	Rear EGPRS	/	24.67	26	0.313	0.44	0.492	0.67	-0.02

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

Table 14.8: SAR Values (WCDMA 850 MHz - Head)

Ambient Temperature: 22.5°C						Liquid Temperature: 22.0°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
836.4	4182	Left	Touch	/	22.78	24	0.191	0.25	0.280	0.37	0.02
836.4	4182	Left	Tilt	/	22.78	24	0.081	0.11	0.115	0.15	-0.04
836.4	4182	Right	Touch	/	22.78	24	0.172	0.23	0.248	0.33	-0.06
836.4	4182	Right	Tilt	/	22.78	24	0.092	0.12	0.131	0.17	0.10
846.6	4233	Left	Touch	Fig.5	22.72	24	0.235	0.32	0.312	0.42	0.08
826.4	4132	Left	Touch	/	23.41	24	0.183	0.21	0.268	0.31	-0.17

Table 14.9: SAR Values (WCDMA 850 MHz -Body) -AP ON

Ambient Temperature: 22.5°C						Liquid Temperature: 22.0°C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
836.4	4182	Front	/	22.78	24	0.216	0.29	0.305	0.40	0.01
836.4	4182	Rear	/	22.78	24	0.175	0.23	0.248	0.33	-0.02
836.4	4182	Left	/	22.78	24	0.115	0.15	0.167	0.22	0.06
836.4	4182	Right	/	22.78	24	0.081	0.11	0.119	0.16	-0.05
836.4	4182	Bottom	/	22.78	24	0.040	0.05	0.060	0.08	-0.03
846.6	4233	Front	Fig.6	22.72	24	0.259	0.35	0.339	0.46	0.11
826.4	4132	Front	/	23.41	24	0.220	0.25	0.311	0.36	-0.13

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

Table 14.10: SAR Values (WCDMA 850 MHz -Body) -AP OFF

Ambient Temperature: 22.5°C						Liquid Temperature: 22.0°C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
836.4	4182	Front	/	22.78	24	0.216	0.29	0.305	0.40	0.01
836.4	4182	Rear	/	22.78	24	0.175	0.23	0.248	0.33	-0.02
846.6	4233	Front	/	22.72	24	0.259	0.35	0.339	0.46	0.11
826.4	4132	Front	/	23.41	24	0.220	0.25	0.311	0.36	-0.13

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

Table 14.11: SAR Values (WCDMA1900 MHz - Head)

Ambient Temperature: 21.8°C						Liquid Temperature: 21.3°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1880	9400	Left	Touch	/	22.94	24	0.088	0.11	0.145	0.19	0.14
1880	9400	Left	Tilt	/	22.94	24	0.050	0.06	0.090	0.11	0.00
1880	9400	Right	Touch	/	22.94	24	0.109	0.14	0.173	0.22	0.16
1880	9400	Right	Tilt	/	22.94	24	0.048	0.06	0.085	0.11	0.15
1907.6	9538	Right	Touch	Fig.7	22.75	24	0.111	0.15	0.178	0.24	0.07
1852.4	9262	Right	Touch	/	22.72	24	0.098	0.13	0.169	0.23	0.08

Table 14.12: SAR Values (WCDMA1900 MHz Body) -AP ON

Ambient Temperature: 22.3°C					Liquid Temperature: 21.8°C					
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1880	9400	Front	/	22.94	24	0.259	0.33	0.475	0.61	-0.05
1880	9400	Rear	/	22.94	24	0.296	0.38	0.529	0.68	-0.14
1880	9400	Left	/	22.94	24	0.045	0.06	0.075	0.10	0.05
1880	9400	Right	/	22.94	24	0.075	0.10	0.125	0.16	-0.02
1880	9400	Bottom	/	22.94	24	0.202	0.26	0.367	0.47	0.08
1907.6	9538	Rear	Fig.8	22.75	24	0.332	0.44	0.593	0.79	-0.07
1852.4	9262	Rear	/	22.72	24	0.261	0.35	0.465	0.62	-0.17

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

Table 14.13: SAR Values (WCDMA1900 MHz -Body) -AP OFF

Ambient Temperature: 22.3°C						Liquid Temperature: 21.8°C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1880	9400	Front	/	22.94	24	0.259	0.33	0.475	0.61	-0.05
1880	9400	Rear	/	22.94	24	0.296	0.38	0.529	0.68	-0.14
1907.6	9538	Rear	/	22.75	24	0.332	0.44	0.593	0.79	-0.07
1852.4	9262	Rear	/	22.72	24	0.261	0.35	0.465	0.62	-0.17

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

Table 14.14: SAR Values (LTE Band 2-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	18700	1RB_Low	Left Touch	22.64	23	/	0.099	0.11	0.161	0.17	0.10
1860	18700	50RB_Low	Left Touch	21.60	22	/	0.074	0.08	0.130	0.14	0.02
1860	18700	1RB_Low	Left Tilt	22.64	23	/	0.038	0.04	0.067	0.07	0.03
1860	18700	50RB_Low	Left Tilt	21.60	22	/	0.030	0.03	0.053	0.06	0.06
1860	18700	1RB_Low	Right Touch	22.64	23	Fig.9	0.134	0.15	0.221	0.24	-0.16
1860	18700	50RB_Low	Right Touch	21.60	22	/	0.101	0.11	0.175	0.19	-0.12
1860	18700	1RB_Low	Right Tilt	22.64	23	/	0.042	0.05	0.074	0.08	0.12
1860	18700	50RB_Low	Right Tilt	21.60	22	/	0.033	0.04	0.057	0.06	0.16

Table 14.15: SAR Values (LTE Band 2-Body)-AP ON

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	18700	1RB_Low	Front	22.64	23	Fig.10	0.261	0.28	0.456	0.50	-0.03
1860	18700	50RB_Low	Front	21.60	22	/	0.208	0.23	0.372	0.41	-0.09
1860	18700	1RB_Low	Rear	22.64	23	/	0.234	0.25	0.427	0.46	-0.09
1860	18700	50RB_Low	Rear	21.60	22	/	0.187	0.21	0.341	0.37	-0.08
1860	18700	1RB_Low	Left	22.64	23	/	0.043	0.05	0.069	0.07	-0.14
1860	18700	50RB_Low	Left	21.60	22	/	0.034	0.04	0.056	0.06	0.03
1860	18700	1RB_Low	Right	22.64	23	/	0.045	0.05	0.076	0.08	0.19
1860	18700	50RB_Low	Right	21.60	22	/	0.036	0.04	0.060	0.07	0.15
1860	18700	1RB_Low	Bottom	22.64	23	/	0.186	0.20	0.330	0.36	0.03
1860	18700	50RB_Low	Bottom	21.60	22	/	0.146	0.16	0.262	0.29	-0.01

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

Table 14.16: SAR Values (LTE Band 2-Body)-AP OFF

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	18700	1RB_Low	Front	22.64	23	/	0.261	0.28	0.456	0.50	-0.03
1860	18700	50RB_Low	Front	21.60	22	/	0.208	0.23	0.372	0.41	-0.09
1860	18700	1RB_Low	Rear	22.64	23	/	0.234	0.25	0.427	0.46	-0.09
1860	18700	50RB_Low	Rear	21.60	22	/	0.187	0.21	0.341	0.37	-0.08

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

Table 14.17: SAR Values (LTE Band 4-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1720	20050	1RB_Low	Left Touch	22.86	23	/	0.106	0.11	0.178	0.18	-0.06
1720	20050	50RB_Low	Left Touch	21.85	22	/	0.074	0.08	0.124	0.13	0.02
1720	20050	1RB_Low	Left Tilt	22.86	23	/	0.045	0.05	0.080	0.08	0.04
1720	20050	50RB_Low	Left Tilt	21.85	22	/	0.029	0.03	0.055	0.06	0.15
1720	20050	1RB_Low	Right Touch	22.86	23	Fig.11	0.192	0.20	0.303	0.31	0.03
1720	20050	50RB_Low	Right Touch	21.85	22	/	0.136	0.14	0.229	0.24	0.07
1720	20050	1RB_Low	Right Tilt	22.86	23	/	0.049	0.05	0.080	0.08	0.13
1720	20050	50RB_Low	Right Tilt	21.85	22	/	0.034	0.04	0.055	0.06	0.11

Table 14.18: SAR Values (LTE Band 4-Body)–AP ON

Ambient Temperature: 22.2°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1720	20050	1RB_Low	Front	22.86	23	Fig.12	0.345	0.36	0.574	0.59	-0.15
1720	20050	50RB_Low	Front	21.85	22	/	0.259	0.27	0.428	0.44	-0.07
1720	20050	1RB_Low	Rear	22.86	23	/	0.305	0.31	0.532	0.55	0.07
1720	20050	50RB_Low	Rear	21.85	22	/	0.244	0.25	0.428	0.44	-0.12
1720	20050	1RB_Low	Left	22.86	23	/	0.041	0.04	0.064	0.07	0.04
1720	20050	50RB_Low	Left	21.85	22	/	0.033	0.03	0.052	0.05	-0.07
1720	20050	1RB_Low	Right	22.86	23	/	0.087	0.09	0.145	0.15	-0.03
1720	20050	50RB_Low	Right	21.85	22	/	0.057	0.06	0.093	0.10	-0.19
1720	20050	1RB_Low	Bottom	22.86	23	/	0.226	0.23	0.396	0.41	0.05
1720	20050	50RB_Low	Bottom	21.85	22	/	0.160	0.17	0.288	0.30	-0.03

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

Table 14.19: SAR Values (LTE Band 4-Body)–AP OFF

Ambient Temperature: 22.2°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1720	20050	1RB_Low	Front	22.86	23	/	0.345	0.36	0.574	0.59	-0.15
1720	20050	50RB_Low	Front	21.85	22	/	0.259	0.27	0.428	0.44	-0.07
1720	20050	1RB_Low	Rear	22.86	23	/	0.305	0.31	0.532	0.55	0.07
1720	20050	50RB_Low	Rear	21.85	22	/	0.244	0.25	0.428	0.44	-0.12

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

Table 14.20: SAR Values (LTE Band 5-Head)

Frequency		Ambient Temperature: 22.4°C Liquid Temperature: 21.9°C									
MHz	Ch.	Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
829	20450	1RB_Mid	Left Touch	22.62	23	Fig.13	0.253	0.28	0.332	0.36	-0.04
829	20450	25RB_Mid	Left Touch	21.66	22	/	0.178	0.19	0.258	0.28	0.11
829	20450	1RB_Mid	Left Tilt	22.62	23	/	0.117	0.13	0.167	0.18	0.06
829	20450	25RB_Mid	Left Tilt	21.66	22	/	0.092	0.10	0.132	0.14	-0.02
829	20450	1RB_Mid	Right Touch	22.62	23	/	0.199	0.22	0.258	0.28	-0.03
829	20450	25RB_Mid	Right Touch	21.66	22	/	0.132	0.14	0.188	0.20	0.12
829	20450	1RB_Mid	Right Tilt	22.62	23	/	0.109	0.12	0.161	0.18	0.16
829	20450	25RB_Mid	Right Tilt	21.66	22	/	0.088	0.10	0.126	0.14	0.11

Table 14.21: SAR Values (LTE Band 5-Body) -AP ON

Frequency		Ambient Temperature: 22.4°C Liquid Temperature: 21.9°C									
MHz	Ch.	Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
829	20450	1RB_Mid	Front	22.62	23	/	0.168	0.18	0.238	0.26	-0.04
829	20450	25RB_Mid	Front	21.66	22	/	0.138	0.15	0.195	0.21	0.11
829	20450	1RB_Mid	Rear	22.62	23	Fig.14	0.187	0.20	0.246	0.27	0.06
829	20450	25RB_Mid	Rear	21.66	22	/	0.140	0.15	0.197	0.21	-0.02
829	20450	1RB_Mid	Left	22.62	23	/	0.162	0.18	0.238	0.26	-0.03
829	20450	25RB_Mid	Left	21.66	22	/	0.133	0.14	0.195	0.21	0.12
829	20450	1RB_Mid	Right	22.62	23	/	0.140	0.15	0.216	0.24	0.16
829	20450	25RB_Mid	Right	21.66	22	/	0.121	0.13	0.179	0.19	0.11
829	20450	1RB_Mid	Bottom	22.62	23	/	0.050	0.05	0.075	0.08	0.12
829	20450	25RB_Mid	Bottom	21.66	22	/	0.040	0.04	0.060	0.06	0.09

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

Table 14.22: SAR Values (LTE Band 5-Body) -AP OFF

Frequency		Ambient Temperature: 22.4°C Liquid Temperature: 21.9°C									
MHz	Ch.	Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
829	20450	1RB_Mid	Front	22.62	23	/	0.168	0.18	0.238	0.26	-0.04
829	20450	25RB_Mid	Front	21.66	22	/	0.138	0.15	0.195	0.21	0.11
829	20450	1RB_Mid	Rear	22.62	23	/	0.187	0.20	0.246	0.27	0.06
829	20450	25RB_Mid	Rear	21.66	22	/	0.140	0.15	0.197	0.21	-0.02

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

Table 14.23: SAR Values (LTE Band 7-Head)

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2535	21100	1RB_High	Left Touch	23.32	23.5	/	0.072	0.08	0.135	0.14	0.07
2535	21100	50RB_High	Left Touch	22.34	22.5	/	0.057	0.06	0.111	0.12	0.03
2535	21100	1RB_High	Left Tilt	23.32	23.5	/	0.018	0.02	0.037	0.04	0.02
2535	21100	50RB_High	Left Tilt	22.34	22.5	/	0.011	0.01	0.027	0.03	0.09
2535	21100	1RB_High	Right Touch	23.32	23.5	Fig.15	0.109	0.11	0.220	0.23	0.06
2535	21100	50RB_High	Right Touch	22.34	22.5	/	0.086	0.09	0.152	0.16	0.14
2535	21100	1RB_High	Right Tilt	23.32	23.5	/	0.020	0.02	0.045	0.05	0.09
2535	21100	50RB_High	Right Tilt	22.34	22.5	/	0.018	0.02	0.042	0.04	-0.13

Table 14.24: SAR Values (LTE Band 7-Body) -AP ON

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2535	21100	1RB_High	Front	23.32	23.5	/	0.360	0.38	0.721	0.75	0.18
2535	21100	50RB_High	Front	22.34	22.5	/	0.326	0.34	0.668	0.69	0.18
2535	21100	1RB_High	Rear	23.32	23.5	/	0.387	0.40	0.754	0.79	-0.19
2535	21100	50RB_High	Rear	22.34	22.5	/	0.340	0.35	0.695	0.72	-0.03
2535	21100	1RB_High	Left	23.32	23.5	/	0.046	0.05	0.078	0.08	-0.02
2535	21100	50RB_High	Left	22.34	22.5	/	0.038	0.04	0.063	0.07	-0.12
2535	21100	1RB_High	Right	23.32	23.5	/	0.056	0.06	0.097	0.10	-0.17
2535	21100	50RB_High	Right	22.34	22.5	/	0.045	0.05	0.077	0.08	0.12
2535	21100	1RB_High	Bottom	23.32	23.5	/	0.584	0.61	1.110	1.16	0.01
2535	21100	50RB_High	Bottom	22.34	22.5	/	0.498	0.52	0.974	1.01	-0.05
2560	21350	1RB_High	Bottom	22.86	23.5	/	0.524	0.61	0.996	1.15	-0.18
2510	20850	1RB_High	Bottom	23.05	23.5	Fig.16	0.514	0.57	0.988	1.10	0.13
2560	21350	50RB_High	Bottom	22.09	22.5	/	0.495	0.54	0.967	1.06	0.05
2510	20850	50RB_High	Bottom	22.11	22.5	/	0.452	0.49	0.882	0.96	0.04
2535	21100	100RB	Bottom	22.23	22.5	/	0.477	0.51	0.931	0.99	0.11

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

Table 14.25: AR Values (LTE Band 7-Body) -AP OFF

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2535	21100	1RB_High	Front	23.32	23.5	/	0.360	0.38	0.721	0.75	0.18
2535	21100	50RB_High	Front	22.34	22.5	/	0.326	0.34	0.668	0.69	0.18
2535	21100	1RB_High	Rear	23.32	23.5	/	0.387	0.40	0.754	0.79	-0.19

2535	21100	50RB_High	Rear	22.34	22.5	/	0.340	0.35	0.695	0.72	-0.03
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Note1: The distance between the EUT and the phantom bottom is 10mm

Table 14.26: SAR Values (LTE Band 12-Head)

Ambient Temperature: 22.0°C						Liquid Temperature: 21.5°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
704	23060	1RB_Low	Left Touch	22.78	23	Fig.17	0.103	0.11	0.148	0.16	-0.12
704	23060	25RB_Low	Left Touch	21.94	22	/	0.081	0.08	0.116	0.12	0.13
704	23060	1RB_Low	Left Tilt	22.78	23	/	0.064	0.07	0.091	0.10	0.01
704	23060	25RB_Low	Left Tilt	21.94	22	/	0.049	0.05	0.069	0.07	0.12
704	23060	1RB_Low	Right Touch	22.78	23	/	0.101	0.11	0.146	0.15	0.19
704	23060	25RB_Low	Right Touch	21.94	22	/	0.084	0.09	0.119	0.12	0.16
704	23060	1RB_Low	Right Tilt	22.78	23	/	0.049	0.05	0.069	0.07	0.13
704	23060	25RB_Low	Right Tilt	21.94	22	/	0.037	0.04	0.053	0.05	0.14

Table 14.27: SAR Values (LTE Band 12-Body) -AP ON

Ambient Temperature: 22.1°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
704	23060	1RB_Low	Front	22.78	23	Fig.18	0.124	0.13	0.174	0.18	0.11
704	23060	25RB_Low	Front	21.94	22	/	0.096	0.10	0.134	0.14	0.08
704	23060	1RB_Low	Rear	22.78	23	/	0.131	0.14	0.166	0.17	-0.05
704	23060	25RB_Low	Rear	21.94	22	/	0.084	0.09	0.118	0.12	-0.07
704	23060	1RB_Low	Left	22.78	23	/	0.078	0.08	0.113	0.12	0.04
704	23060	25RB_Low	Left	21.94	22	/	0.060	0.06	0.087	0.09	0.06
704	23060	1RB_Low	Right	22.78	23	/	0.087	0.09	0.125	0.13	-0.12
704	23060	25RB_Low	Right	21.94	22	/	0.067	0.07	0.099	0.10	-0.17
704	23060	1RB_Low	Bottom	22.78	23	/	0.013	0.01	0.019	0.02	0.10
704	23060	25RB_Low	Bottom	21.94	22	/	0.010	0.01	0.015	0.02	0.02

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

Table 14.28: SAR Values (LTE Band 12-Body)-AP OFF

Ambient Temperature: 22.1°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
704	23060	1RB_Low	Front	22.78	23	/	0.124	0.13	0.174	0.18	0.11
704	23060	25RB_Low	Front	21.94	22	/	0.096	0.10	0.134	0.14	0.08
704	23060	1RB_Low	Rear	22.78	23	/	0.131	0.14	0.166	0.17	-0.05
704	23060	25RB_Low	Rear	21.94	22	/	0.084	0.09	0.118	0.12	-0.07

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

Table 14.29: SAR Values (LTE Band 13-Head)

Ambient Temperature: 22.6°C						Liquid Temperature: 22.0°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
782	23230	1RB_High	Left Touch	22.53	23	Fig.19	0.214	0.24	0.278	0.31	-0.15
782	23230	25RB_High	Left Touch	21.48	22	/	0.158	0.18	0.229	0.26	0.13
782	23230	1RB_High	Left Tilt	22.53	23	/	0.110	0.12	0.156	0.17	0.04
782	23230	25RB_High	Left Tilt	21.48	22	/	0.090	0.10	0.128	0.14	0.09
782	23230	1RB_High	Right Touch	22.53	23	/	0.136	0.15	0.195	0.22	0.14
782	23230	25RB_High	Right Touch	21.48	22	/	0.111	0.13	0.159	0.18	0.18
782	23230	1RB_High	Right Tilt	22.53	23	/	0.078	0.09	0.111	0.12	-0.11
782	23230	25RB_High	Right Tilt	21.48	22	/	0.064	0.07	0.091	0.10	0.12

Table 14.30: SAR Values (LTE Band 13-Body) -AP ON

Ambient Temperature: 22.4°C						Liquid Temperature: 21.9°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
782	23230	1RB_High	Front	22.53	23	/	0.165	0.18	0.233	0.26	0.10
782	23230	25RB_High	Front	21.48	22	/	0.143	0.16	0.201	0.23	-0.10
782	23230	1RB_High	Rear	22.53	23	Fig.20	0.219	0.24	0.319	0.36	-0.10
782	23230	25RB_High	Rear	21.48	22	/	0.189	0.21	0.268	0.30	0.10
782	23230	1RB_High	Left	22.53	23	/	0.105	0.12	0.152	0.17	0.01
782	23230	25RB_High	Left	21.48	22	/	0.091	0.10	0.132	0.15	0.01
782	23230	1RB_High	Right	22.53	23	/	0.106	0.12	0.154	0.17	0.10
782	23230	25RB_High	Right	21.48	22	/	0.093	0.10	0.135	0.15	0.01
782	23230	1RB_High	Bottom	22.53	23	/	0.035	0.04	0.052	0.06	0.01
782	23230	25RB_High	Bottom	21.48	22	/	0.033	0.04	0.049	0.06	0.02

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

Table 14.31: SAR Values (LTE Band 13-Body) -AP OFF

Ambient Temperature: 22.4°C						Liquid Temperature: 21.9°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
782	23230	1RB_High	Front	22.53	23	/	0.165	0.18	0.233	0.26	0.10
782	23230	25RB_High	Front	21.48	22	/	0.143	0.16	0.201	0.23	-0.10
782	23230	1RB_High	Rear	22.53	23	/	0.219	0.24	0.319	0.36	-0.10
782	23230	25RB_High	Rear	21.48	22	/	0.189	0.21	0.268	0.30	0.10

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

Table 14.32: SAR Values (LTE Band 17-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.8°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
711	23800	1RB_Low	Left Touch	22.94	23	Fig.21	0.115	0.12	0.154	0.16	-0.05
709	23780	25RB_Low	Left Touch	21.64	22	/	0.084	0.09	0.120	0.13	-0.02
711	23800	1RB_Low	Left Tilt	22.94	23	/	0.058	0.06	0.081	0.08	0.01
709	23780	25RB_Low	Left Tilt	21.64	22	/	0.048	0.05	0.068	0.07	0.03
711	23800	1RB_Low	Right Touch	22.94	23	/	0.102	0.10	0.147	0.15	-0.05
709	23780	25RB_Low	Right Touch	21.64	22	/	0.082	0.09	0.117	0.13	-0.02
711	23800	1RB_Low	Right Tilt	22.94	23	/	0.064	0.06	0.091	0.09	-0.04
709	23780	25RB_Low	Right Tilt	21.64	22	/	0.050	0.05	0.071	0.08	-0.02

Table 14.33: SAR Values (LTE Band 17-Body) -AP ON

Ambient Temperature: 22.5°C						Liquid Temperature: 22.0°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
711	23800	1RB_Low	Front	22.94	23	/	0.108	0.11	0.151	0.15	0.05
709	23780	25RB_Low	Front	21.64	22	/	0.104	0.11	0.146	0.16	0.11
711	23800	1RB_Low	Rear	22.94	23	Fig.22	0.124	0.13	0.158	0.16	0.07
709	23780	25RB_Low	Rear	21.64	22	/	0.107	0.12	0.150	0.16	-0.03
711	23800	1RB_Low	Left	22.94	23	/	0.072	0.07	0.103	0.10	0.09
709	23780	25RB_Low	Left	21.64	22	/	0.066	0.07	0.096	0.10	0.04
711	23800	1RB_Low	Right	22.94	23	/	0.080	0.08	0.126	0.13	0.13
709	23780	25RB_Low	Right	21.64	22	/	0.080	0.09	0.115	0.12	0.12
711	23800	1RB_Low	Bottom	22.94	23	/	0.012	0.01	0.019	0.02	0.11
709	23780	25RB_Low	Bottom	21.64	22	/	0.011	0.01	0.016	0.02	-0.06

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

Table 14.34: SAR Values (LTE Band 17-Body) -AP OFF

Ambient Temperature: 22.5°C						Liquid Temperature: 22.0°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
711	23800	1RB_Low	Front	22.94	23	/	0.108	0.11	0.151	0.15	0.05
709	23780	25RB_Low	Front	21.64	22	/	0.104	0.11	0.146	0.16	0.11
711	23800	1RB_Low	Rear	22.94	23	/	0.124	0.13	0.158	0.16	0.07
709	23780	25RB_Low	Rear	21.64	22	/	0.107	0.12	0.150	0.16	-0.03

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

Table 14.35: SAR Values (LTE Band 25-Head)

Ambient Temperature: 21.9°C						Liquid Temperature: 21.4°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	26140	1RB_Low	Left Touch	22.52	23	/	0.083	0.09	0.145	0.16	0.09
1860	26140	50RB_Low	Left Touch	21.55	22	/	0.063	0.07	0.110	0.12	-0.07
1860	26140	1RB_Low	Left Tilt	22.52	23	/	0.039	0.04	0.071	0.08	0.08
1860	26140	50RB_Low	Left Tilt	21.55	22	/	0.032	0.04	0.058	0.06	0.12
1860	26140	1RB_Low	Right Touch	22.52	23	Fig.23	0.098	0.11	0.163	0.18	0.08
1860	26140	50RB_Low	Right Touch	21.55	22	/	0.076	0.08	0.128	0.14	0.01
1860	26140	1RB_Low	Right Tilt	22.52	23	/	0.035	0.04	0.064	0.07	0.02
1860	26140	50RB_Low	Right Tilt	21.55	22	/	0.021	0.02	0.047	0.05	0.11

Table 14.36: SAR Values (LTE Band 25-Body) -AP ON

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	26140	1RB_Low	Front	22.52	23	Fig.24	0.276	0.31	0.508	0.57	0.03
1860	26140	50RB_Low	Front	21.55	22	/	0.209	0.23	0.372	0.41	0.13
1860	26140	1RB_Low	Rear	22.52	23	/	0.243	0.27	0.439	0.49	0.04
1860	26140	50RB_Low	Rear	21.55	22	/	0.183	0.20	0.335	0.37	-0.07
1860	26140	1RB_Low	Left	22.52	23	/	0.043	0.05	0.070	0.08	0.05
1860	26140	50RB_Low	Left	21.55	22	/	0.036	0.04	0.058	0.06	-0.09
1860	26140	1RB_Low	Right	22.52	23	/	0.076	0.08	0.127	0.14	0.18
1860	26140	50RB_Low	Right	21.55	22	/	0.062	0.07	0.103	0.11	-0.11
1860	26140	1RB_Low	Bottom	22.52	23	/	0.189	0.21	0.334	0.37	0.05
1860	26140	50RB_Low	Bottom	21.55	22	/	0.145	0.16	0.259	0.29	0.03

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

Table 14.37: SAR Values (LTE Band 25-Body) -AP OFF

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	26140	1RB_Low	Front	22.52	23	/	0.276	0.083	0.508	0.57	0.03
1860	26140	50RB_Low	Front	21.55	22	/	0.209	0.063	0.372	0.41	0.13
1860	26140	1RB_Low	Rear	22.52	23	/	0.243	0.039	0.439	0.49	0.04
1860	26140	50RB_Low	Rear	21.55	22	/	0.183	0.032	0.335	0.37	-0.07

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

Table 14.38: SAR Values (LTE Band 26-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.8°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
831.5	26865	1RB_High	Left Touch	22.62	23	Fig.25	0.179	0.20	0.234	0.26	-0.02
841.5	26965	36RB_High	Left Touch	22.69	23	/	0.139	0.15	0.203	0.22	-0.13
831.5	26865	1RB_High	Left Tilt	22.62	23	/	0.126	0.14	0.181	0.20	0.09
841.5	26965	36RB_High	Left Tilt	22.69	23	/	0.101	0.11	0.147	0.16	0.08
831.5	26865	1RB_High	Right Touch	22.62	23	/	0.139	0.15	0.201	0.22	0.16
841.5	26965	36RB_High	Right Touch	22.69	23	/	0.119	0.13	0.173	0.19	0.13
831.5	26865	1RB_High	Right Tilt	22.62	23	/	0.060	0.07	0.085	0.09	0.12
841.5	26965	36RB_High	Right Tilt	22.69	23	/	0.049	0.05	0.070	0.08	-0.08

Table 14.39: SAR Values (LTE Band 26-Body) -AP ON

Ambient Temperature: 22.7°C						Liquid Temperature: 22.2°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
831.5	26865	1RB_High	Front	22.62	23	/	0.150	0.16	0.216	0.24	-0.02
841.5	26965	36RB_High	Front	22.69	23	/	0.126	0.14	0.181	0.19	-0.13
831.5	26865	1RB_High	Rear	22.62	23	Fig.26	0.197	0.22	0.322	0.35	0.09
841.5	26965	36RB_High	Rear	22.69	23	/	0.168	0.18	0.259	0.28	0.08
831.5	26865	1RB_High	Left	22.62	23	/	0.096	0.10	0.140	0.15	0.16
841.5	26965	36RB_High	Left	22.69	23	/	0.083	0.09	0.122	0.13	0.13
831.5	26865	1RB_High	Right	22.62	23	/	0.102	0.11	0.149	0.16	0.12
841.5	26965	36RB_High	Right	22.69	23	/	0.081	0.09	0.118	0.13	-0.08
831.5	26865	1RB_High	Bottom	22.62	23	/	0.046	0.05	0.068	0.07	-0.12
841.5	26965	36RB_High	Bottom	22.69	23	/	0.041	0.04	0.062	0.07	-0.05

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

Table 14.40: SAR Values (LTE Band 26-Body) -AP OFF

Ambient Temperature: 22.7°C						Liquid Temperature: 22.2°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
831.5	26865	1RB_High	Front	22.62	23	/	0.150	0.16	0.216	0.24	-0.02
841.5	26965	36RB_High	Front	22.69	23	/	0.126	0.14	0.181	0.19	-0.13
831.5	26865	1RB_High	Rear	22.62	23	/	0.197	0.22	0.322	0.35	0.09
841.5	26965	36RB_High	Rear	22.69	23	/	0.168	0.18	0.259	0.28	0.08

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

Table 14.41: SAR Values (LTE Band 38-Head)

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2580	37850	1RB_Low	Left Touch	22.36	23	/	0.026	0.03	0.050	0.06	0.09
2580	37850	50RB_Low	Left Touch	21.42	22	/	0.021	0.02	0.040	0.05	0.06
2580	37850	1RB_Low	Left Tilt	22.36	23	/	0.006	0.01	0.013	0.02	-0.07
2580	37850	50RB_Low	Left Tilt	21.42	22	/	0.005	0.01	0.012	0.01	0.10
2580	37850	1RB_Low	Right Touch	22.36	23	Fig.27	0.043	0.05	0.092	0.11	0.09
2580	37850	50RB_Low	Right Touch	21.42	22	/	0.035	0.04	0.084	0.10	0.09
2580	37850	1RB_Low	Right Tilt	22.36	23	/	0.008	0.01	0.019	0.02	0.08
2580	37850	50RB_Low	Right Tilt	21.42	22	/	0.007	0.01	0.016	0.02	0.09

Table 14.42: SAR Values (LTE Band 38-Body) -AP ON

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2580	37850	1RB_Low	Front	22.36	23	/	0.122	0.14	0.241	0.28	0.11
2580	37850	50RB_Low	Front	21.42	22	/	0.099	0.11	0.196	0.22	0.15
2580	37850	1RB_Low	Rear	22.36	23	/	0.177	0.21	0.351	0.41	-0.06
2580	37850	50RB_Low	Rear	21.42	22	/	0.117	0.13	0.240	0.27	-0.11
2580	37850	1RB_Low	Left	22.36	23	/	0.011	0.01	0.020	0.02	-0.16
2580	37850	50RB_Low	Left	21.42	22	/	0.009	0.01	0.016	0.02	0.13
2580	37850	1RB_Low	Right	22.36	23	/	0.017	0.02	0.029	0.03	0.10
2580	37850	50RB_Low	Right	21.42	22	/	0.015	0.02	0.027	0.03	-0.19
2580	37850	1RB_Low	Bottom	22.36	23	Fig.28	0.247	0.29	0.471	0.55	0.17
2580	37850	50RB_Low	Bottom	21.42	22	/	0.161	0.18	0.321	0.37	0.14

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

Table 14.43: SAR Values (LTE Band 38-Body) -AP OFF

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2580	37850	1RB_Low	Front	22.36	23	/	0.122	0.14	0.241	0.28	0.11
2580	37850	50RB_Low	Front	21.42	22	/	0.099	0.11	0.196	0.22	0.15
2580	37850	1RB_Low	Rear	22.36	23	/	0.177	0.21	0.351	0.41	-0.06
2580	37850	50RB_Low	Rear	21.42	22	/	0.117	0.13	0.240	0.27	-0.11

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

14.2 SAR results for Standard procedure

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

Table 14.44: SAR Values (GSM 850 MHz - Head)

Ambient Temperature: 22.4 °C					Liquid Temperature: 22.0 °C						
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
848.8	251	Left	Touch	Fig.1	32.04	33	0.265	0.33	0.352	0.44	0.09

Table 14.45: SAR Values (GSM 850 MHz -Body) –AP ON

Ambient Temperature: 22.2. °C Liquid Temperature: 21.7 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
824.2	128	Front	Fig.2	28.61	29	0.491	0.54	0.665	0.73	0.08

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

Table 14.46: SAR Values (GSM 1900 MHz - Head)

Ambient Temperature: 22.2 °C					Liquid Temperature: 21.7 °C						
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
1880	661	Right	Touch	Fig.3	28.98	30	0.060	0.08	0.100	0.13	-0.05

Table 14.47: SAR Values (GSM 1900 MHz -Body) –AP ON

Ambient Temperature: 22.2°C						Liquid Temperature: 21.7°C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1909.8	810	Rear	Fig.4	25.51	26	0.345	0.39	0.610	0.68	-0.08

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

Table 14.48: SAR Values (WCDMA 850 MHz - Head)

Ambient Temperature: 22.5 °C					Liquid Temperature: 22.0 °C						
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
846.6	4233	Left	Touch	Fig.5	22.72	24	0.235	0.32	0.312	0.42	0.08

Table 14.49: SAR Values (WCDMA 850 MHz -Body) –AP ON

Ambient Temperature: 22.5°C					Liquid Temperature: 22.0°C					
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
846.6	4233	Front	Fig.6	22.72	24	0.259	0.35	0.339	0.46	0.11

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

Table 14.50: SAR Values (WCDMA1900 MHz - Head)

Ambient Temperature: 21.8°C						Liquid Temperature: 21.3°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1907.6	9538	Right	Touch	Fig.7	22.75	24	0.111	0.15	0.178	0.24	0.07

Table 14.51: SAR Values (WCDMA1900 MHz -Body) –AP ON

Ambient Temperature: 22.3°C					Liquid Temperature: 21.8°C					
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1907.6	9538	Rear	Fig.8	22.75	24	0.332	0.44	0.593	0.79	-0.07

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

Table 14.52: SAR Values (LTE Band 2-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	18700	1RB_Low	Right Touch	22.64	23	Fig.9	0.134	0.15	0.221	0.24	-0.16

Table 14.53: SAR Values (LTE Band 2-Body) -AP ON

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	18700	1RB_Low	Front	22.64	23	Fig.10	0.261	0.28	0.456	0.50	-0.03

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

Table 14.54: SAR Values (LTE Band 4-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1720	20050	1RB_Low	Right Touch	22.86	23	Fig.11	0.192	0.20	0.303	0.31	0.03

Table 14.55: SAR Values (LTE Band 4-Body) -AP ON

Ambient Temperature: 22.2°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1720	20050	1RB_Low	Front	22.86	23	Fig.12	0.345	0.36	0.574	0.59	-0.15

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

Table 14.56: SAR Values (LTE Band 5-Head)

Ambient Temperature: 22.4°C						Liquid Temperature: 21.9°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
829	20450	1RB_Mid	Left Touch	22.62	23	Fig.13	0.253	0.28	0.332	0.36	-0.04

Table 14.57: SAR Values (LTE Band 5-Body) -AP ON

Ambient Temperature: 22.4°C						Liquid Temperature: 21.9°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
829	20450	1RB_Mid	Rear	22.62	23	Fig.14	0.187	0.20	0.246	0.27	0.06

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

Table 14.58: SAR Values (LTE Band 7-Head)

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2535	21100	1RB_High	Right Touch	23.32	23.5	Fig.15	0.109	0.11	0.220	0.23	0.06

Table 14.59: SAR Values (LTE Band 7-Body) -AP ON

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2510	20850	1RB_High	Bottom	23.05	23.5	Fig.16	0.584	0.61	1.110	1.16	0.01

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

Table 14.60: SAR Values (LTE Band 12-Head)

Ambient Temperature: 22.0°C						Liquid Temperature: 21.5°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
704	23060	1RB_Low	Left Touch	22.78	23	Fig.17	0.103	0.11	0.148	0.16	-0.12

Table 14.61: SAR Values (LTE Band 12-Body) -AP ON

Ambient Temperature: 22.1°C						Liquid Temperature: 21.7°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
704	23060	1RB_Low	Front	22.78	23	Fig.18	0.124	0.13	0.174	0.18	0.11

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

Table 14.62: SAR Values (LTE Band 13-Head)

Ambient Temperature: 22.6°C						Liquid Temperature: 22.0°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
782	23230	1RB_High	Left Touch	22.53	23	Fig.19	0.214	0.24	0.278	0.31	-0.15

Table 14.63: SAR Values (LTE Band 13-Body) -AP ON

Ambient Temperature: 22.4°C						Liquid Temperature: 21.9°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
782	23230	1RB_High	Rear	22.53	23	Fig.20	0.219	0.24	0.319	0.36	-0.10

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

Table 14.64: SAR Values (LTE Band 17-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.8°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
711	23800	1RB_Low	Left Touch	22.94	23	Fig.21	0.115	0.12	0.154	0.16	-0.05

Table 14.65: SAR Values (LTE Band 17-Body) -AP ON

Ambient Temperature: 22.5°C						Liquid Temperature: 22.0°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
711	23800	1RB_Low	Rear	22.94	23	Fig.22	0.124	0.13	0.158	0.16	0.07

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

Table 14.66: SAR Values (LTE Band 25-Head)

Ambient Temperature: 21.9°C						Liquid Temperature: 21.4°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	26140	1RB_Low	Right Touch	22.52	23	Fig.23	0.098	0.11	0.163	0.18	0.08

Table 14.67: SAR Values (LTE Band 25-Body) -AP ON

Ambient Temperature: 21.7°C						Liquid Temperature: 21.2°C					
Frequency		Configuration	Test Position	Conduct -ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	26140	1RB_Low	Front	22.52	23	Fig.24	0.276	0.083	0.508	0.57	0.03

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

Table 14.68: SAR Values (LTE Band 26-Head)

Ambient Temperature: 22.3°C						Liquid Temperature: 21.8°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
831.5	26865	1RB_High	Left Touch	22.62	23	Fig.25	0.179	0.20	0.234	0.26	-0.02

Table 14.69: SAR Values (LTE Band 26-Body) -AP ON

Ambient Temperature: 22.7°C						Liquid Temperature: 22.2°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
831.5	26865	1RB_High	Rear	22.62	23	Fig.26	0.197	0.22	0.322	0.35	0.09

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

Table 14.70: SAR Values (LTE Band 38-Head)

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2580	37850	1RB_Low	Right Touch	22.36	23	Fig.27	0.043	0.05	0.092	0.11	0.09

Table 14.71: SAR Values (LTE Band 38-Body) -AP ON

Ambient Temperature: 22.1°C						Liquid Temperature: 21.6°C					
Frequency		Configuration	Test Position	Conduct-ed Power (dBm)	Max. tune-up Power (dBm)	Figure No.	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2580	37850	1RB_Low	Bottom	22.36	23	Fig.28	0.247	0.29	0.471	0.55	0.17

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

14.3 WLAN Evaluation

According to the KDB248227 D01, SAR is measured for 2.4GHz 802.11b DSSS using the initial test position procedure.

Head Evaluation

Table 14.72: SAR Values (WLAN - Head)– 802.11b 1Mbps (Fast SAR)

Ambient Temperature: 22.6°C						Liquid Temperature: 22.1°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2437	6	Left	Touch	/	16.35	17	0.194	0.23	0.351	0.41	0.13
2437	6	Left	Tilt	/	16.35	17	0.169	0.20	0.303	0.35	0.16
2437	6	Right	Touch	/	16.35	17	0.175	0.20	0.313	0.36	0.05
2437	6	Right	Tilt	/	16.35	17	0.124	0.14	0.267	0.31	0.04

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

Table 14.73: SAR Values (WLAN - Head) – 802.11b 1Mbps (Full SAR)

Ambient Temperature: 22.6°C						Liquid Temperature: 22.1°C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2437	6	Left	Touch	Fig.21	16.35	17	0.206	0.24	0.358	0.42	0.13
2437	6	Right	Touch	/	16.35	17	0.178	0.21	0.317	0.37	0.05

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. A maximum transmission duty factor of 98.1% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

Table 14.74: SAR Values (WLAN - Head) – 802.11b 1Mbps (Scaled Reported SAR)

Ambient Temperature: 22.6°C					Liquid Temperature: 22.1°C		
Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.						
2437	6	Left	Touch	98.1%	100%	0.42	0.43
2437	6	Right	Touch	98.1%	100%	0.37	0.38

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

Body Evaluation

Table 14.75: SAR Values (WLAN - Body)– 802.11b 1Mbps (Fast SAR)

Ambient Temperature: 22.6°C						Liquid Temperature: 22.1°C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Front	/	16.35	17	0.033	0.04	0.066	0.08	0.13
2437	6	Rear	/	16.35	17	0.078	0.09	0.145	0.17	-0.03
2437	6	Left	/	16.35	17	0.012	0.01	0.037	0.04	0.11
2437	6	Top	/	16.35	17	0.044	0.05	0.081	0.09	-0.07

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

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

Table 14.76: SAR Values (WLAN - Body) – 802.11b 1Mbps (Full SAR)

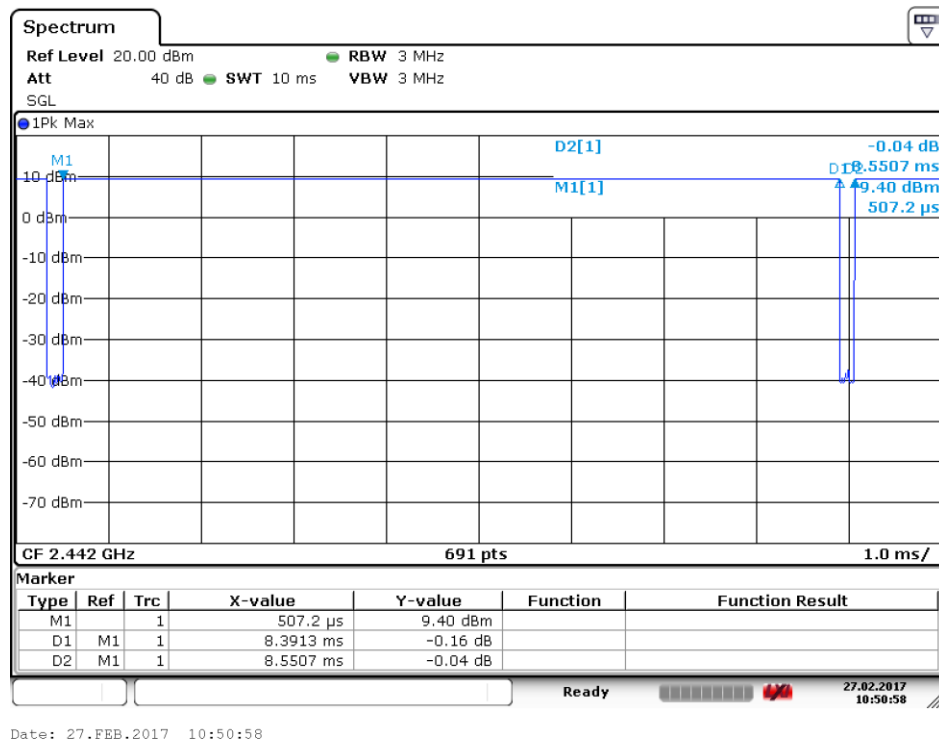
Ambient Temperature: 22.6°C						Liquid Temperature: 22.1°C				
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Rear	Fig.22	16.35	17	0.076	0.09	0.143	0.17	-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. A maximum transmission duty factor of 98.1% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

Table 14.77: SAR Values (WLAN - Body) – 802.11b 1Mbps (Scaled Reported SAR)

Ambient Temperature: 22.3°C				Liquid Temperature: 21.8°C		
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Rear	98.1%	100%	0.17	0.17

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



Picture 14.1: The plot of duty factor

15 SAR Measurement Variability

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

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

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

Table 15.1: SAR Measurement Variability for Body LTE Band 7 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
2535	21100	Bottom	10	1.11	1.10	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	$\sqrt{3}$	1	1	1.6	1.6	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	6.4	6.4	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	0.5	0.5	∞
5	Detection limit	B	1.0	N	1	1	1	1	1	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.0	0.0	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.0	1.0	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
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	1.2	1.2	∞
14	Probe modulation response	B	2.3	R	$\sqrt{3}$	1	1	1.21	1.21	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Power scaling	B	2.4	R	$\sqrt{3}$	1	1	2.4	2.4	∞
18	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
19	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
20	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1	0.28	9
22	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
23	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	0.31	0.25	9
24	Algorithm for correcting SAR for deviations in permittivity and conductivity	B	1.9	N	1	1	1	1.9	1.9	∞
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						11.9	11.8	323
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						23.8	23.7	

16.2 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	$\sqrt{3}$	1	1	1.6	1.6	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	6.4	6.4	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	0.5	0.5	∞
5	Detection limit	B	1.0	R	1	1	1	1	1	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.0	0.0	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.0	1.0	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
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	1.2	1.2	∞
14	Probe modulation response	B	2.3	R	$\sqrt{3}$	1	1	1.21	1.21	∞
15	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	4.0	4.0	1	∞
Test sample related										
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
17	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
18	Power scaling	B	2.2	R	$\sqrt{3}$	1	1	2.2	2.2	∞
19	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
20	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
21	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
22	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
23	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
24	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
25	Algorithm for correcting SAR for deviations in permittivity and conductivity	B	1.9	N	1	1	0.84	1.9	1.6	∞

Combined standard uncertainty	$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$					12.6	12.5	257
Expanded uncertainty (Confidence interval of 95 %)	$u_e = 2u_c$					25.1	25.0	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent E5071C	MY46103759	2016-11-19	One year
02	Dielectric probe	85070E	MY44300317	/	
03	Power meter	NRP	102603	2017-01-06	One year
04	Power sensor	NRP-Z51	102211		
05	Signal Generator	E8257D	MY47461211	2016-06-15	One year
06	Amplifier	VTL5400	0404	/	
07	DAE	SPEAG DAE4	786	2016-12-08	One year
08	E-field Probe	SPEAG ES3DV3	3151	2016-11-17	One year
09	Dipole Validation Kit	SPEAG D750V3	1163	2016-09-19	Three year
10	Dipole Validation Kit	SPEAG D835V2	4d057	2015-10-22	Three year
11	Dipole Validation Kit	SPEAG D1800V2	2d147	2015-11-03	Three year
12	Dipole Validation Kit	SPEAG D1900V2	5d088	2015-11-04	Three year
13	Dipole Validation Kit	SPEAG D2450V2	873	2015-10-30	Three year
14	Dipole Validation Kit	SPEAG D2550V2	1010	2015-07-24	Three year
15	BTS	E5515C	GB47460389	2017-01-06	One year
16	Radio Communication Analyzer	Anristu MT8820C	6201563767	2017-01-06	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850 Left Cheek High

Date/Time: 2017-2-18

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.898$ S/m; $\epsilon_r = 40.672$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C

Communication System: UID 0, 2G_GSM (0) Frequency: 848.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3151 ConvF (6.08, 6.08, 6.08);

Left Cheek High/Area Scan (61x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.374 W/kg

Left Cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 4.930 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.450 W/kg

SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.265 W/kg

Maximum value of SAR (measured) = 0.365 W/kg

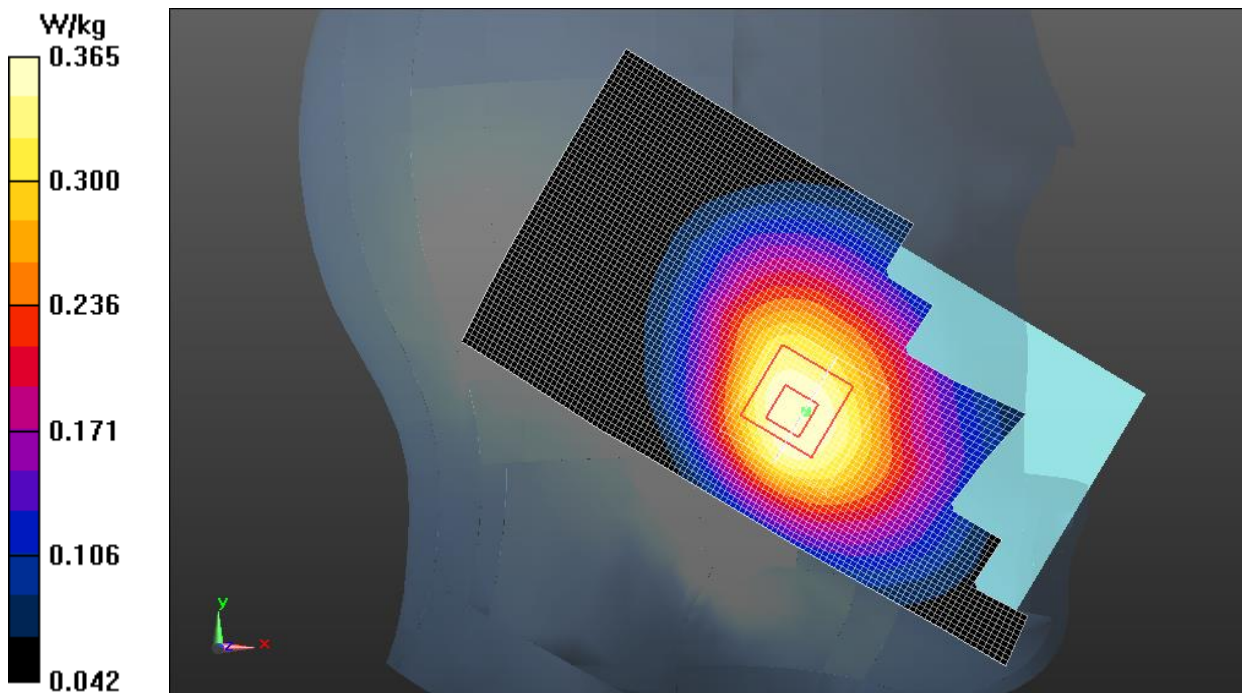


Fig.1 GSM 850MHz CH251

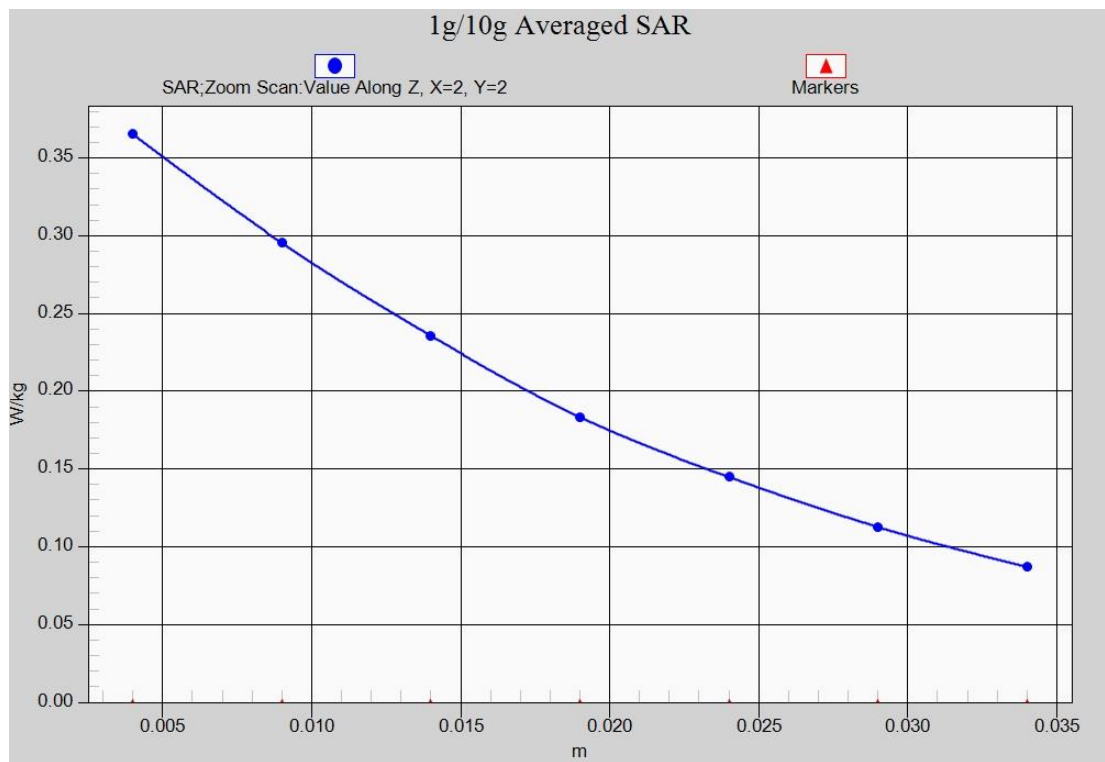


Fig.1-1 Z-Scan at power reference point (GSM 850 MHz CH251)

GSM850 Body Front Low

Date/Time: 2017-2-18

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.967$ S/m; $\epsilon_r = 55.778$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C

Communication System: UID 0, GPRS 4 TX slot (0) Frequency : 824.2 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3151 ConvF (6.13, 6.13, 6.13);

Front side Low/Area Scan (111x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.711 W/kg

Front side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 22.37 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.665 W/kg; SAR(10 g) = 0.491 W/kg

Maximum value of SAR (measured) = 0.692 W/kg

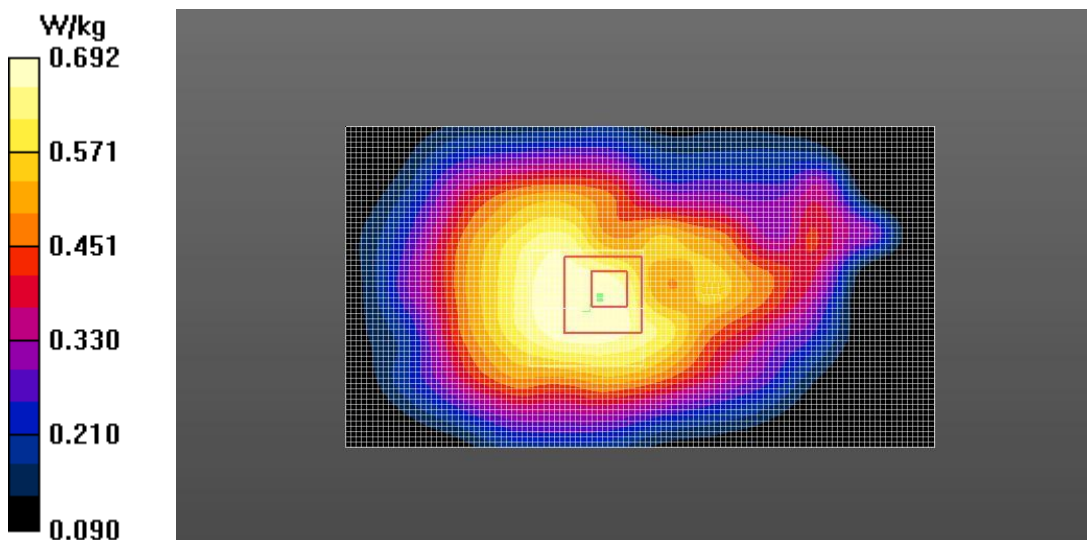


Fig.2 GSM 850 MHz CH128

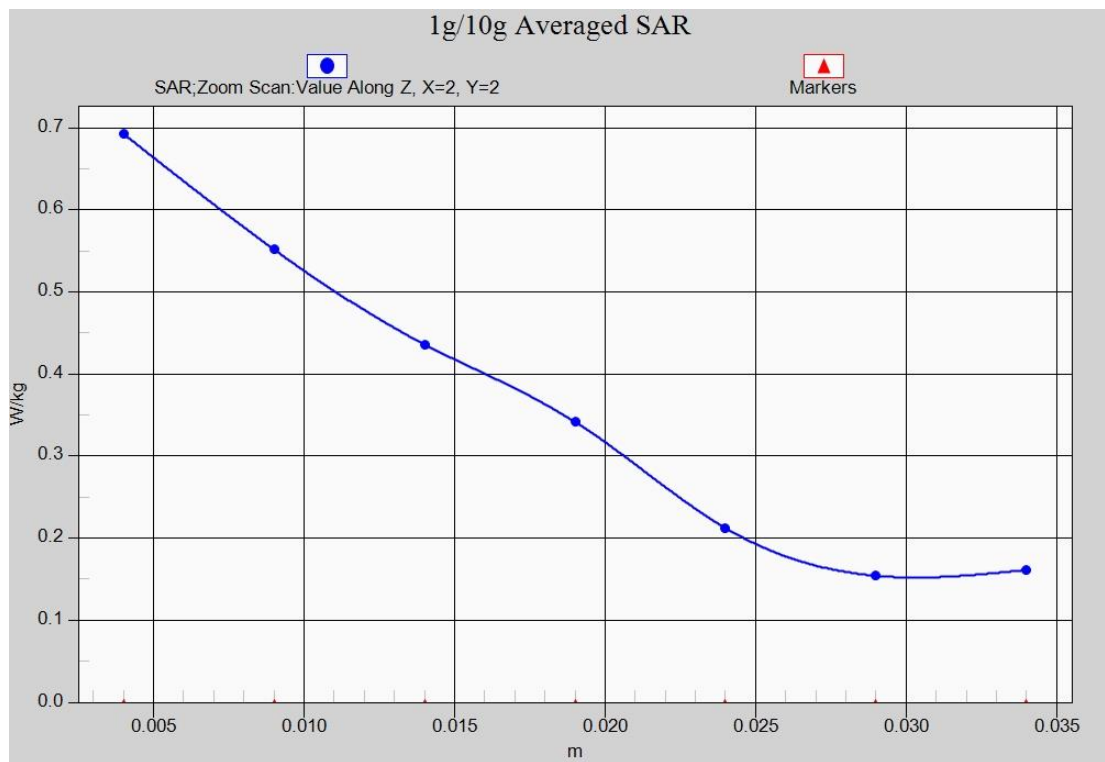


Fig.2-1 Z-Scan at power reference point (GSM 850 MHz CH128)

GSM1900 Right Cheek Middle

Date/Time: 2017-2-12

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.399$ S/m; $\epsilon_r = 40.764$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.2°C Liquid Temperature: 21.7°C

Communication System: UID 0, 2G_GSM (0) Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3151 ConvF (4.88, 4.88, 4.88);

Right Cheek Mid/Area Scan (61x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.111 W/kg

Right Cheek Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 3.479 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.158 W/kg

SAR(1 g) = 0.100 W/kg; SAR(10 g) = 0.060 W/kg

Maximum value of SAR (measured) = 0.107 W/kg

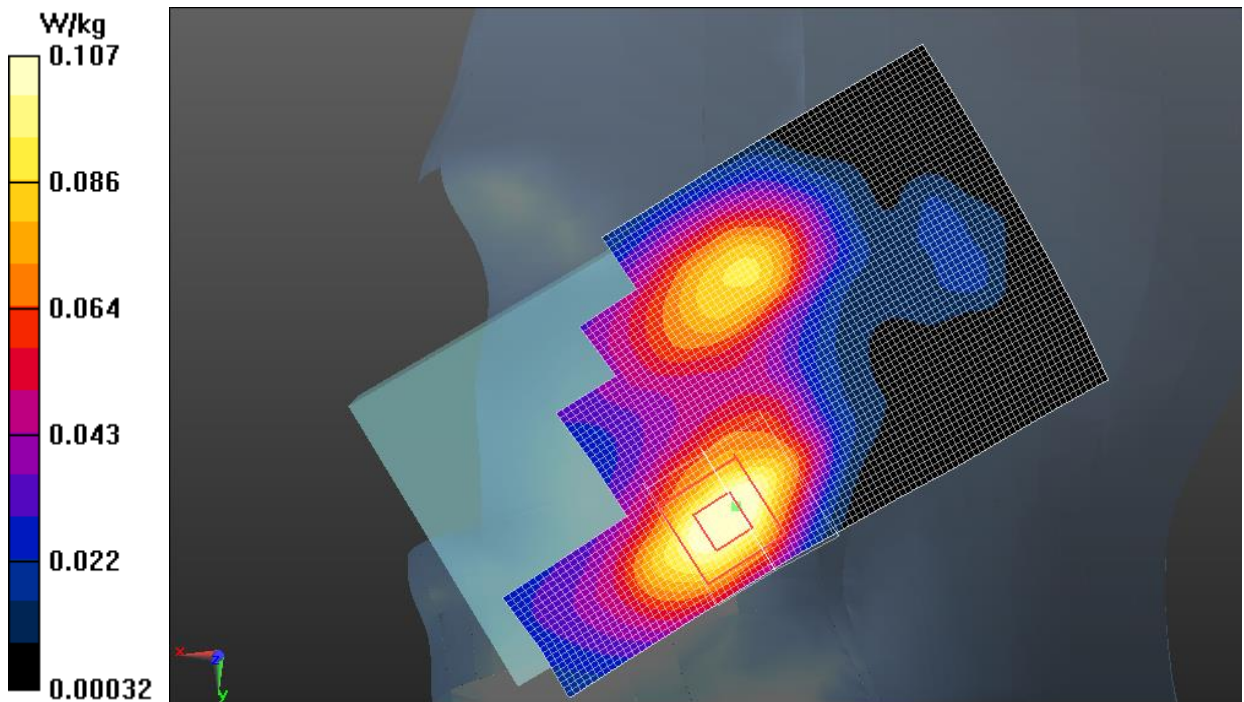


Fig.3 GSM 1900 MHz CH661

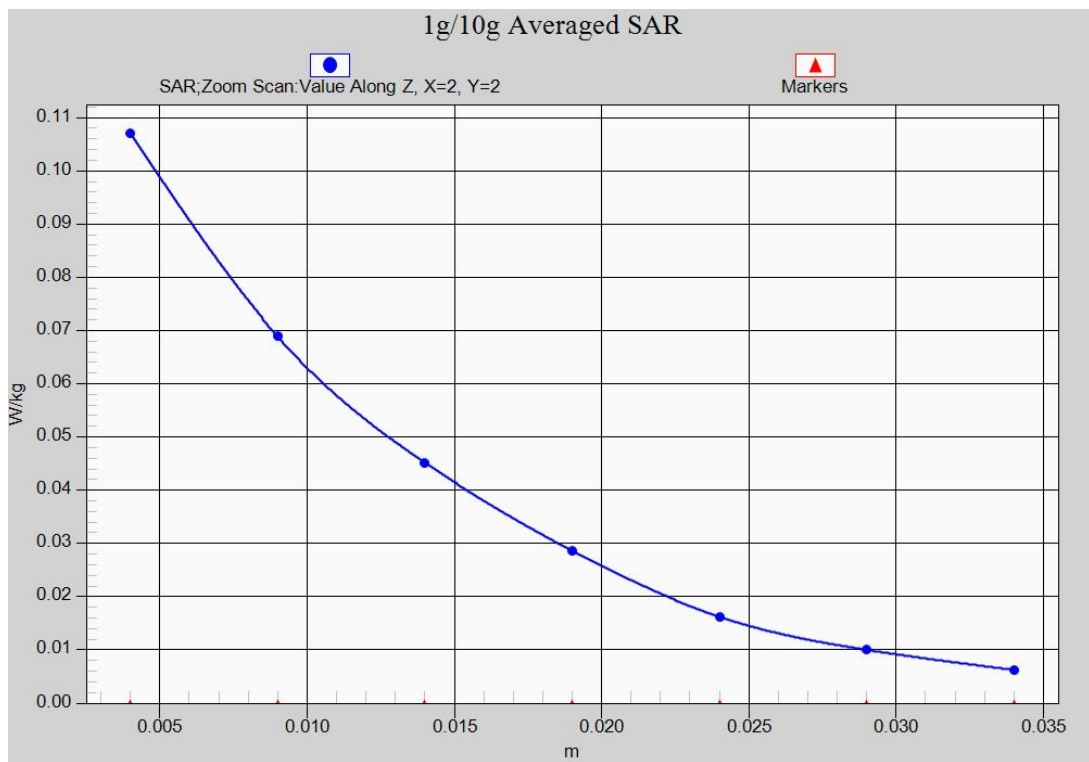


Fig.3-1 Z-Scan at power reference point (GSM 1900 MHz CH661)

GSM1900 Body Rear High

Date/Time: 2017-2-12

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1909.8$ MHz; $\sigma = 1.559$ S/m; $\epsilon_r = 52.926$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.2°C Liquid Temperature: 21.7°C

Communication System: UID 0, GPRS 4 Txslot (0) Frequency: 1909.8 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3151 ConvF (4.49, 4.49, 4.49);

Rear side High/Area Scan (111x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.686 W/kg

Rear side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 10.06 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.610 W/kg; SAR(10 g) = 0.345 W/kg

Maximum value of SAR (measured) = 0.676 W/kg

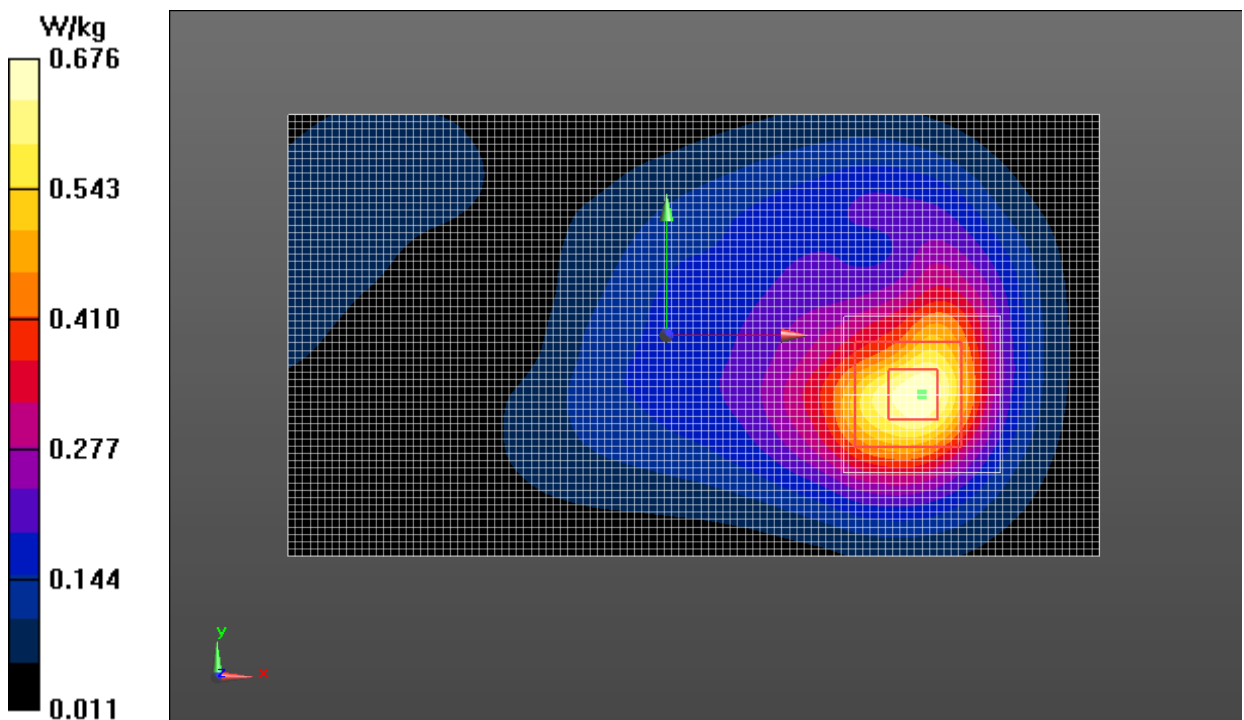


Fig.4 GSM 1900 MHz CH810

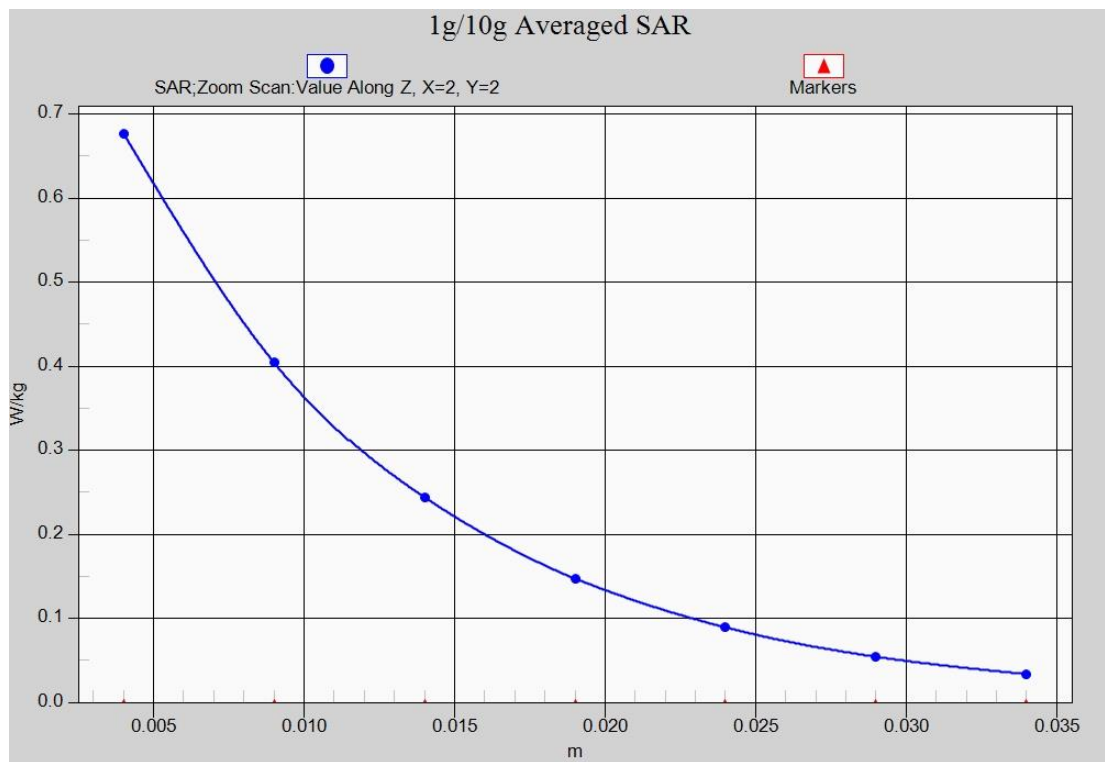


Fig.4-1 Z-Scan at power reference point (GSM 1900 MHz CH810)

WCDMA 850 Left Cheek High

Date/Time: 2017-2-18

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 846.6$ MHz; $\sigma = 0.887$ S/m; $\epsilon_r = 40.806$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: UID 0, 3G_WCDMA (0) Frequency: 846.6 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (6.08, 6.08, 6.08);

Left Cheek High/Area Scan (61x111x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.335 W/kg

Left Cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 4.554 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.396 W/kg

SAR(1 g) = 0.312 W/kg; SAR(10 g) = 0.235 W/kg

Maximum value of SAR (measured) = 0.329 W/kg

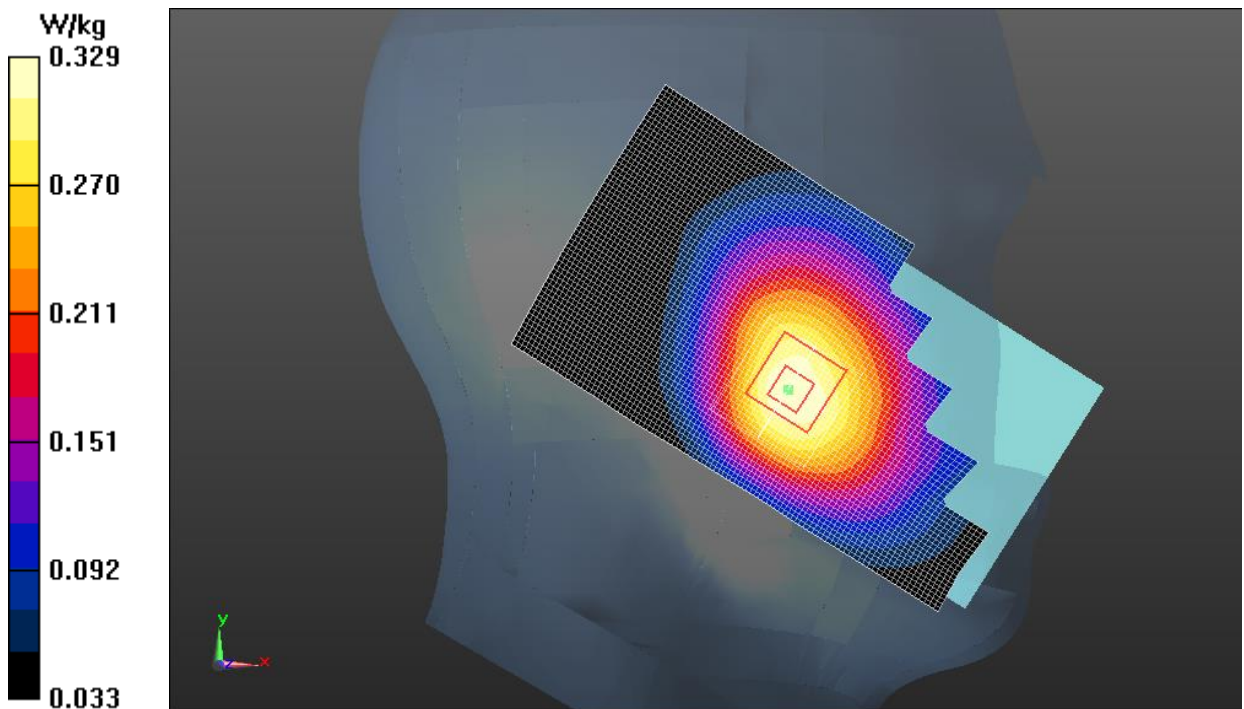


Fig.5 WCDMA 850 CH4233

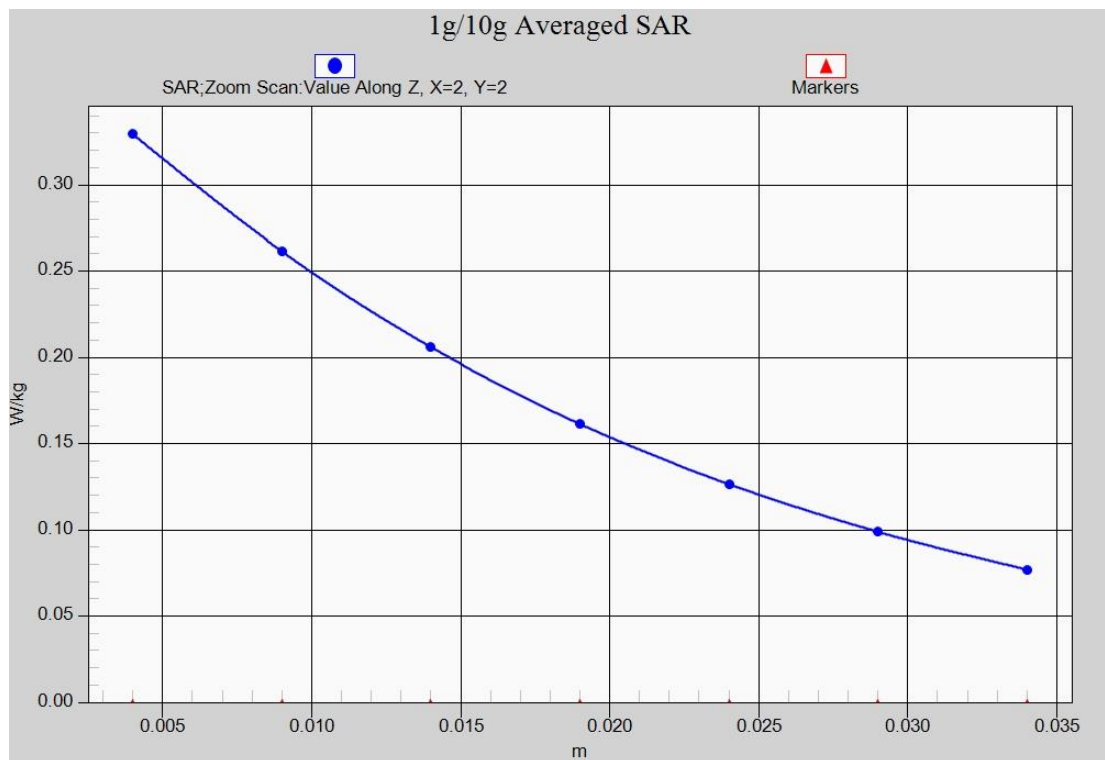


Fig.5-1 Z-Scan at power reference point (WCDMA 850 CH4233)

WCDMA 850 Body Front High

Date/Time: 2017-2-18

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 846.6$ MHz; $\sigma = 0.987$ S/m; $\epsilon_r = 55.578$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: UID 0, 3G_WCDMA (0) Frequency: 846.6 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (6.13, 6.13, 6.13);

Front side High/Area Scan (111x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.354 W/kg

Front side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 17.39 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.421 W/kg

SAR(1 g) = 0.339 W/kg; SAR(10 g) = 0.259 W/kg

Maximum value of SAR (measured) = 0.355 W/kg

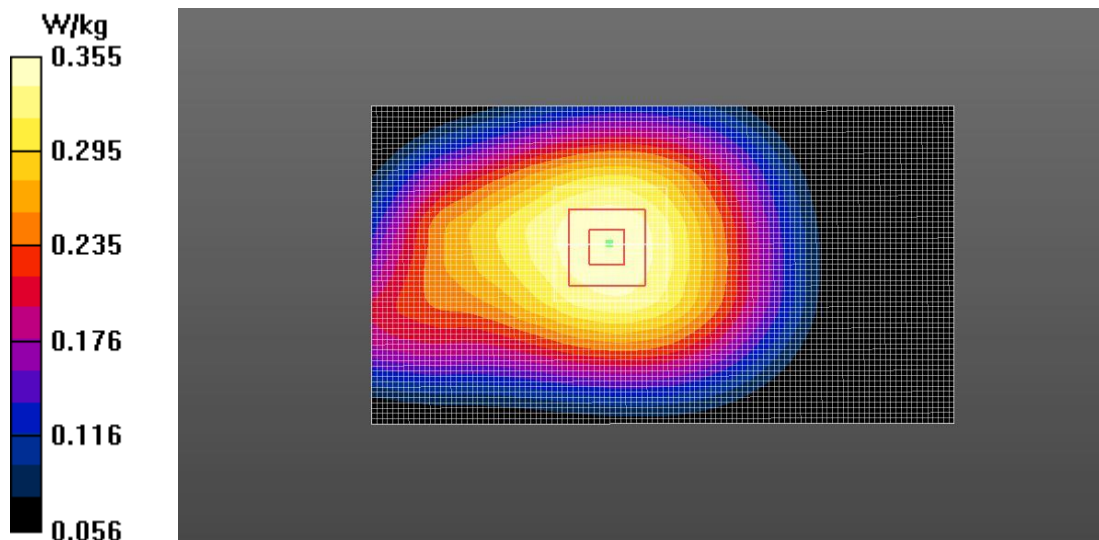


Fig.6 WCDMA 850 CH4233

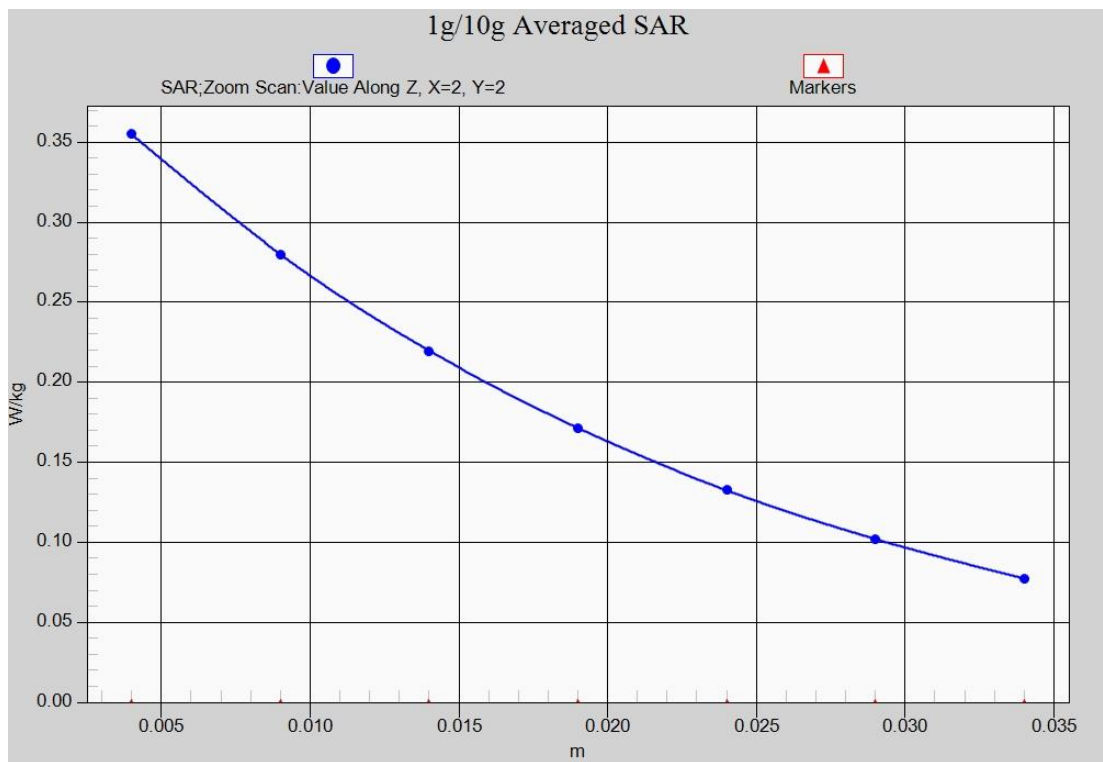


Fig.6-1 Z-Scan at power reference point (WCDMA850 CH4233)

WCDMA 1900 Right Cheek High

Date/Time: 2017-2-12

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1907.6$ MHz; $\sigma = 1.424$ S/m; $\epsilon_r = 40.505$; $\rho = 1000$ kg/m³

Ambient Temperature: 21.8°C Liquid Temperature: 21.3°C

Communication System: UID 0, 3G_WCDMA (0) Frequency: 1907.6 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (4.88, 4.88, 4.88);

Right Cheek High/Area Scan (61x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.209 W/kg

Right Cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 6.229 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.265 W/kg

SAR(1 g) = 0.178 W/kg; SAR(10 g) = 0.111 W/kg

Maximum value of SAR (measured) = 0.187 W/kg

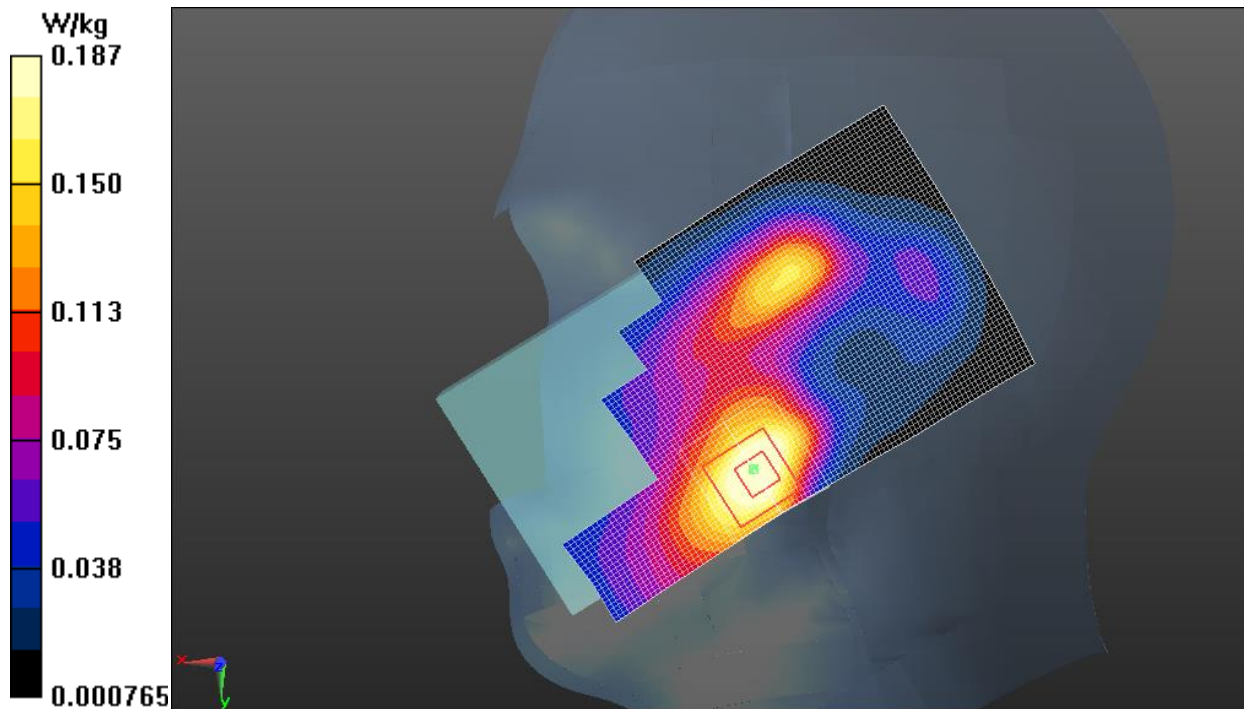


Fig.7 WCDMA1900 CH9538

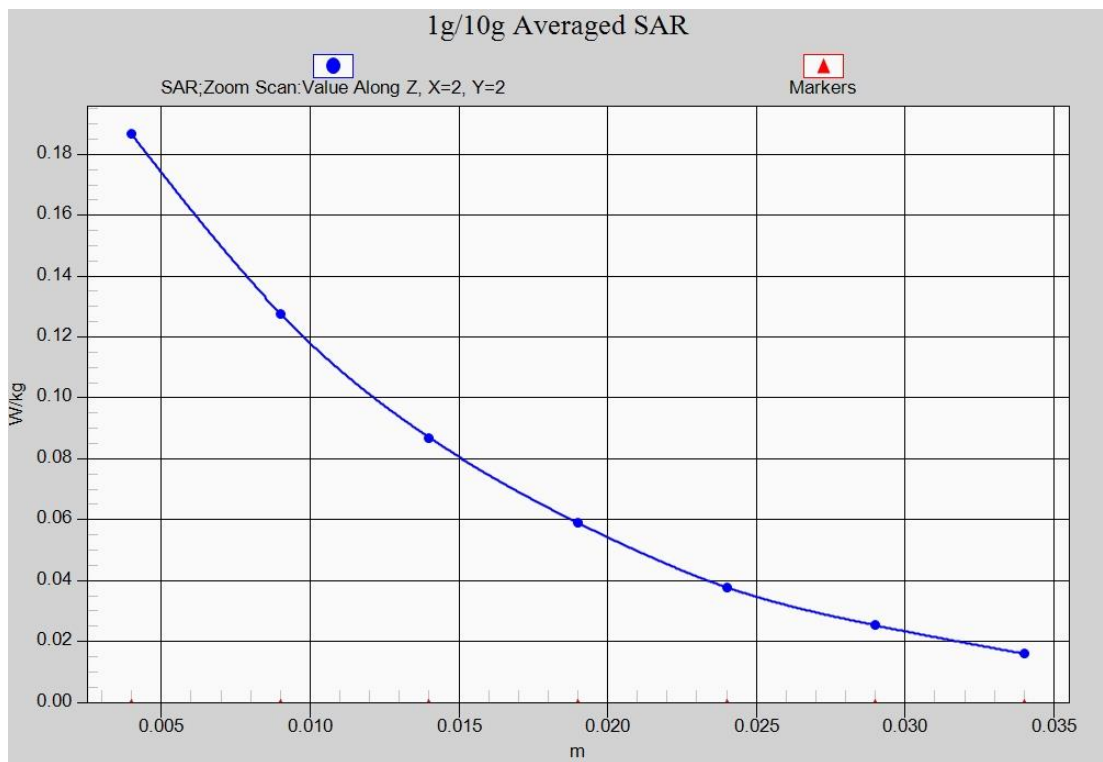


Fig.7-1 Z-Scan at power reference point (WCDMA1900 CH9538)

WCDMA 1900 Body Rear High

Date/Time: 2017-2-12

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1907.6$ MHz; $\sigma = 1.557$ S/m; $\epsilon_r = 52.935$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C

Communication System: UID 0, 3G_WCDMA (0) Frequency: 1907.6 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (4.49, 4.49, 4.49);

Rear side High/Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.628 W/kg

Rear side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.090 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.999 W/kg

SAR(1 g) = 0.593 W/kg; SAR(10 g) = 0.332 W/kg

Maximum value of SAR (measured) = 0.652 W/kg

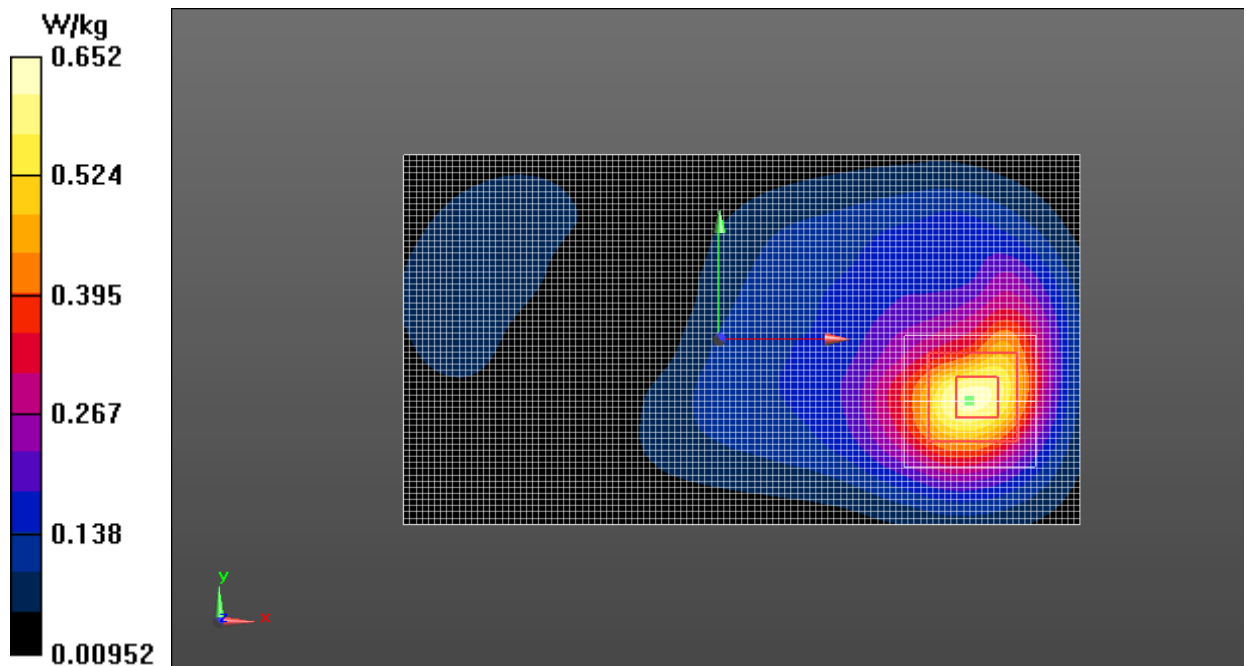


Fig.8 WCDMA1900 CH9538

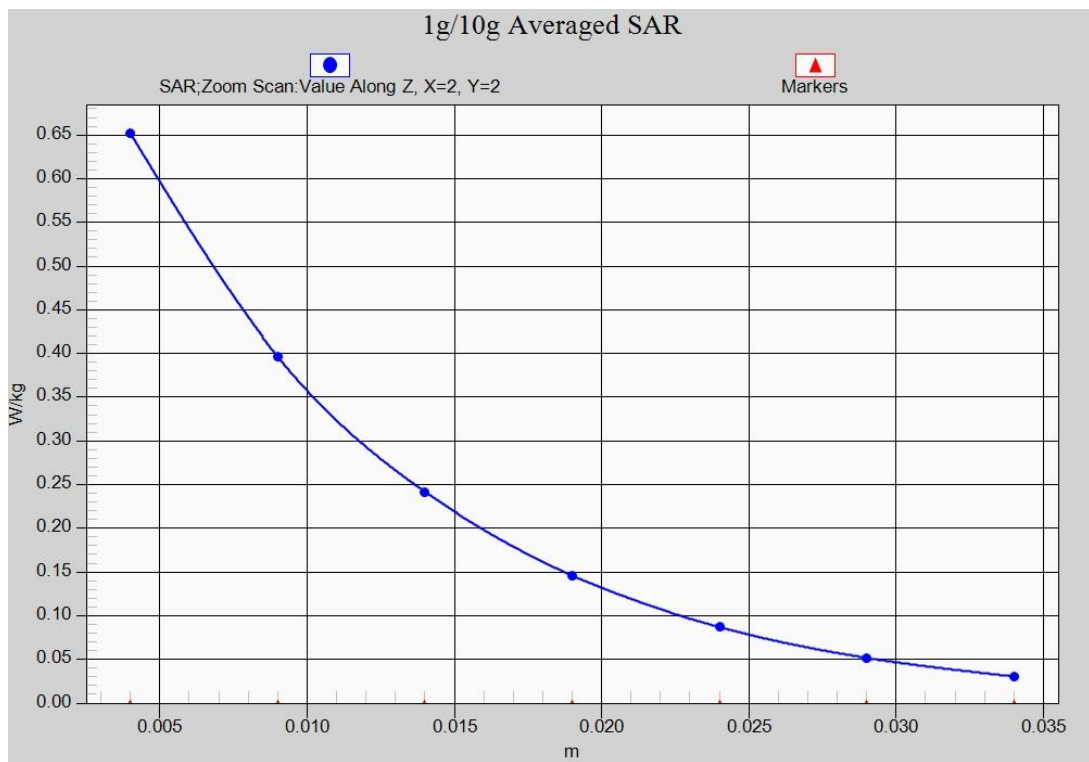


Fig.8-1 Z-Scan at power reference point (WCDMA1900 CH9538)

LTE Band 2 Right Cheek Low with QPSK_20MHz_1RB_Low

Date/Time: 2017-2-12

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: $f = 1860$ MHz; $\sigma = 1.385$ S/m; $\epsilon_r = 40.761$; $\rho = 1000$ kg/m³

Ambient Temperature: 21.5°C Liquid Temperature: 21.0°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (4.88, 4.88, 4.88);

Right Cheek Low_1RB_Low/Area Scan (61x111x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.239 W/kg

Right Cheek Low_1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 4.201 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.348 W/kg

SAR(1 g) = 0.221 W/kg; SAR(10 g) = 0.134 W/kg

Maximum value of SAR (measured) = 0.242 W/kg

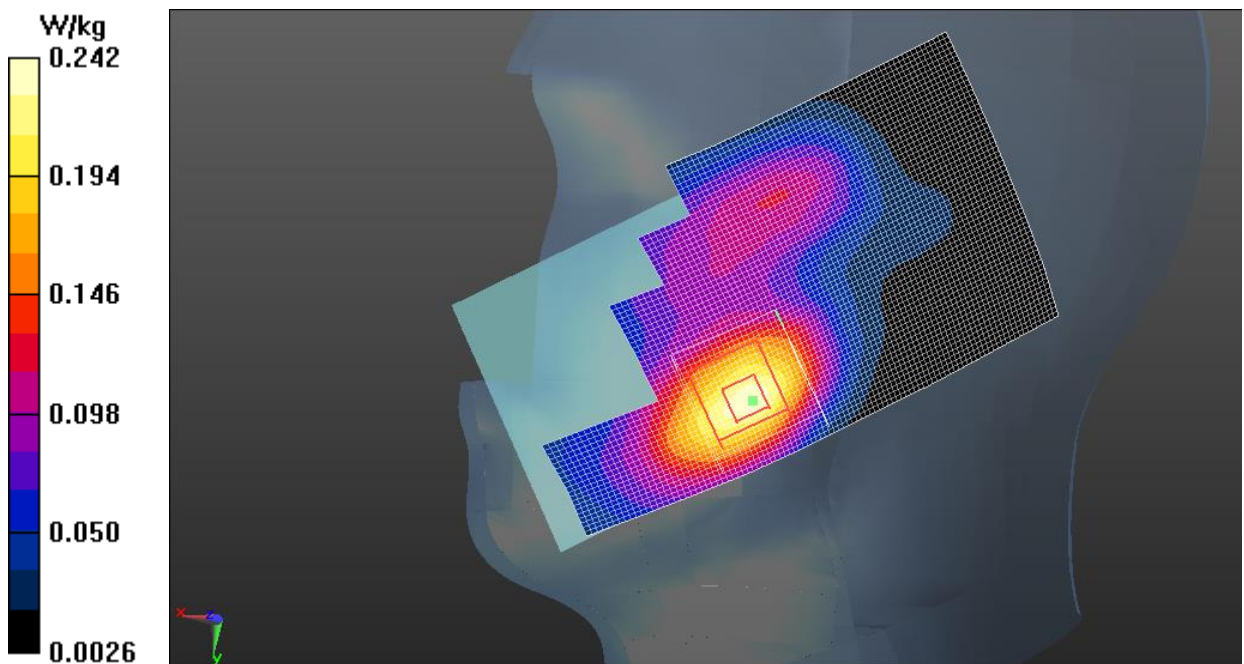


Fig.9 LTE Band 2 CH18700

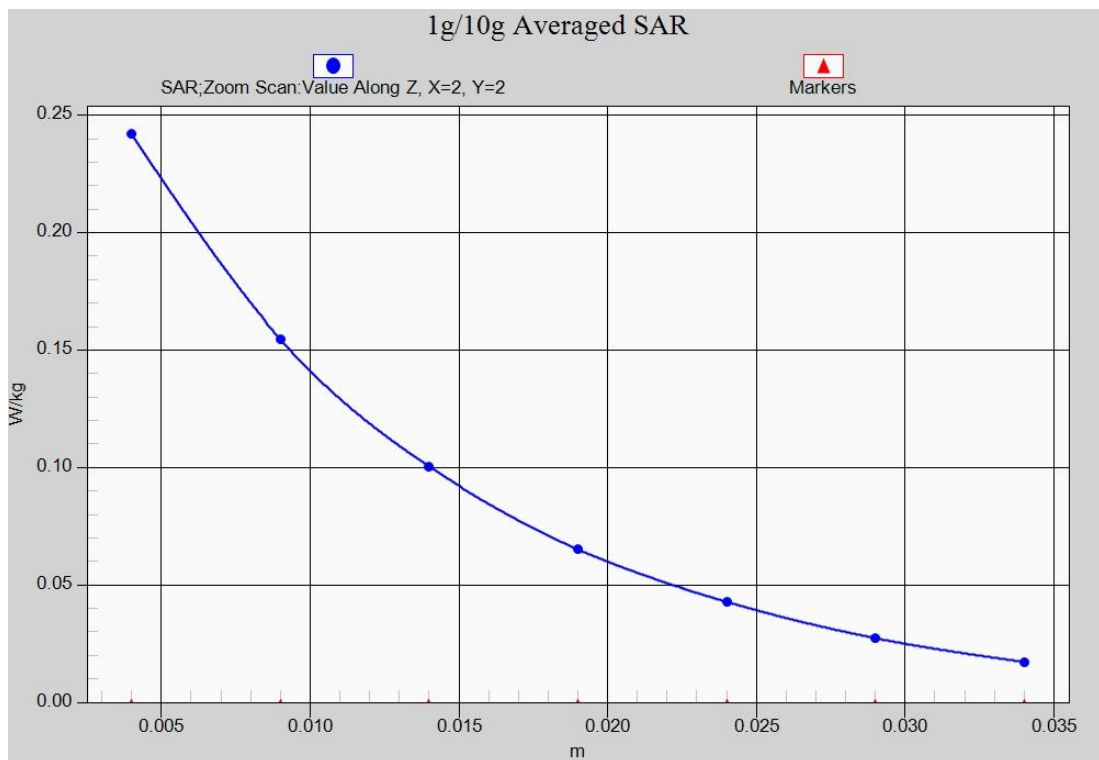


Fig.9-1 Z-Scan at power reference point (Band 2 CH18700)

LTE Band 2 Body Front Low with QPSK_20MHz_1RB_Low

Date/Time: 2017-2-12

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: $f = 1860$ MHz; $\sigma = 1.511$ S/m; $\epsilon_r = 50.037$; $\rho = 1000$ kg/m³

Ambient Temperature: 21.8°C Liquid Temperature: 21.3°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (4.49, 4.49, 4.49);

Front side Low 1RB_Low /Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.506 W/kg

Front side Low 1RB_Low /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.63 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.774 W/kg

SAR(1 g) = 0.456 W/kg; SAR(10 g) = 0.261 W/kg

Maximum value of SAR (measured) = 0.502 W/kg

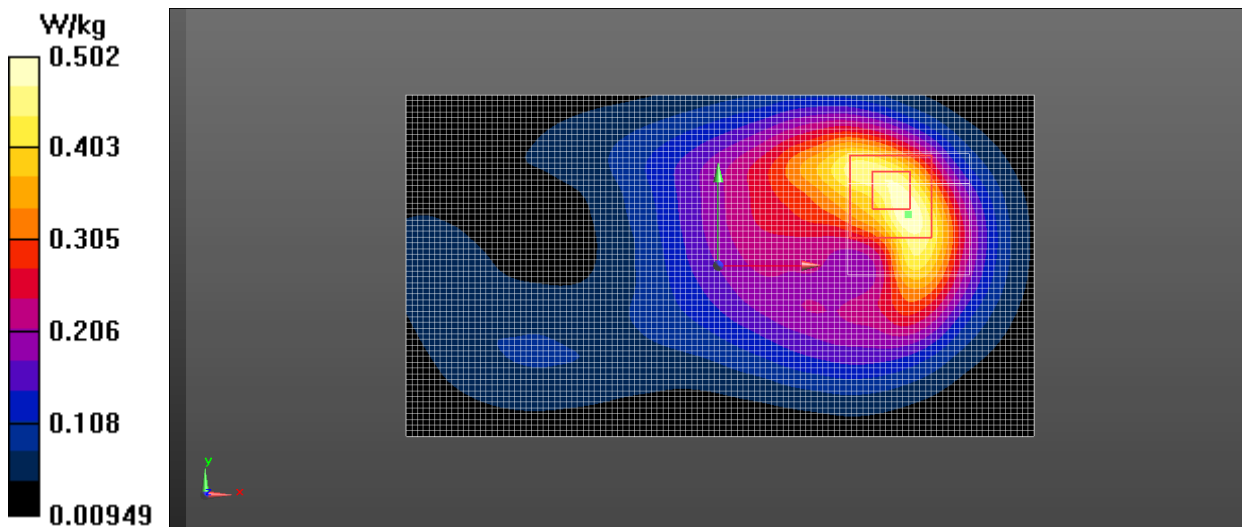


Fig.10 LTE Band 2 CH18700

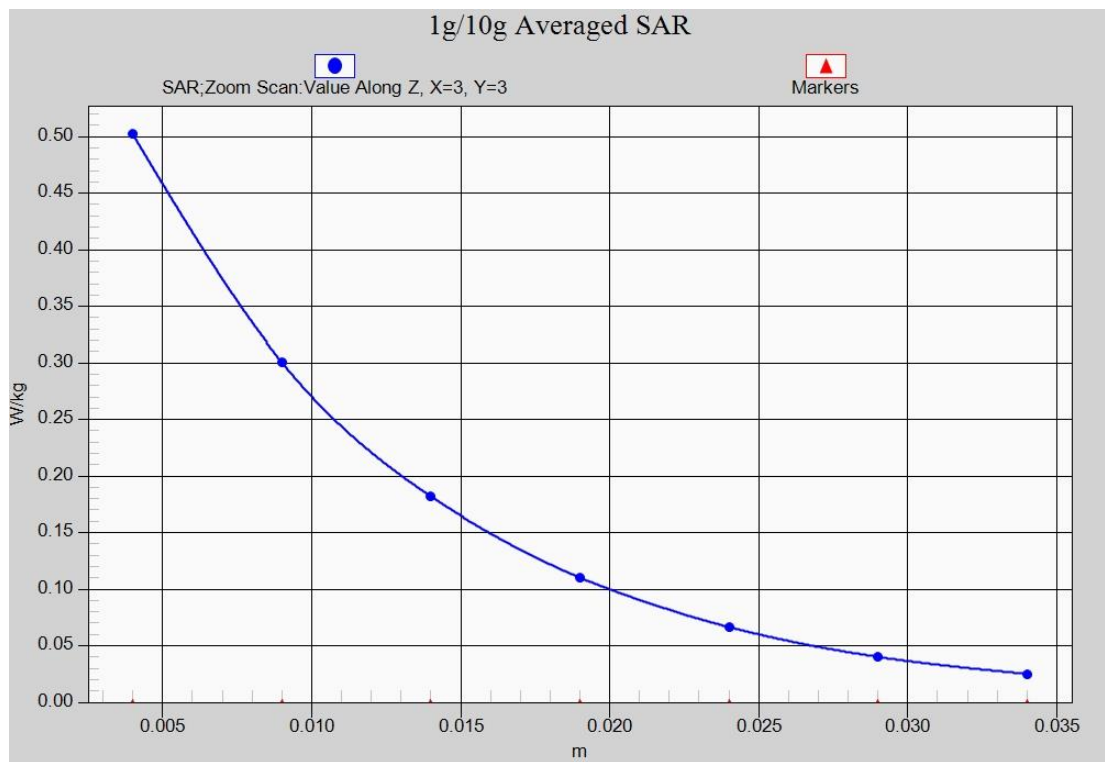


Fig.10-1 Z-Scan at power reference point (Band 2 CH18700)

LTE Band 4 Right Cheek Low with QPSK_20MHz_1RB_Low

Date/Time: 2017-2-13

Electronics: DAE4 Sn786

Medium: Head 1800 MHz

Medium parameters used: $f = 1720$ MHz; $\sigma = 1.307$ S/m; $\epsilon_r = 41.344$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.2°C Liquid Temperature: 21.7°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (5.10, 5.10, 5.10);

Right Cheek Low_1RB_Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.367 W/kg

Right Cheek Low_1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.660 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.450 W/kg

SAR(1 g) = 0.303 W/kg; SAR(10 g) = 0.192 W/kg

Maximum value of SAR (measured) = 0.329 W/kg

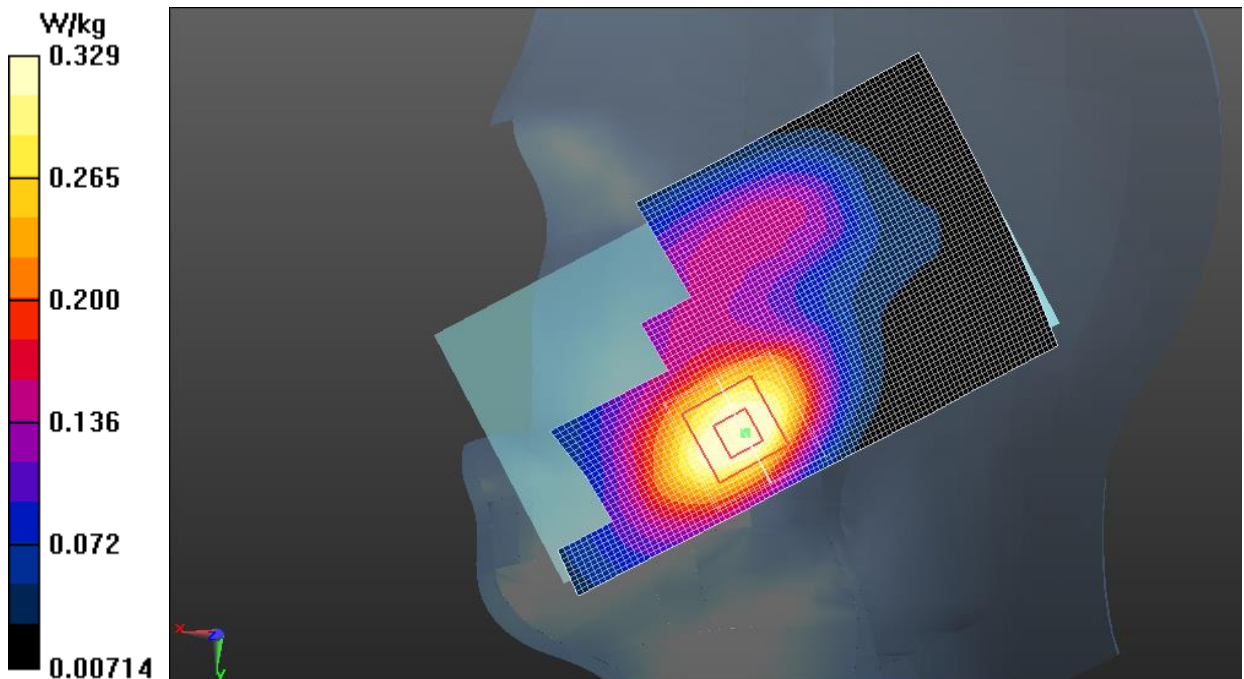


Fig.11 LTE Band4 CH20050

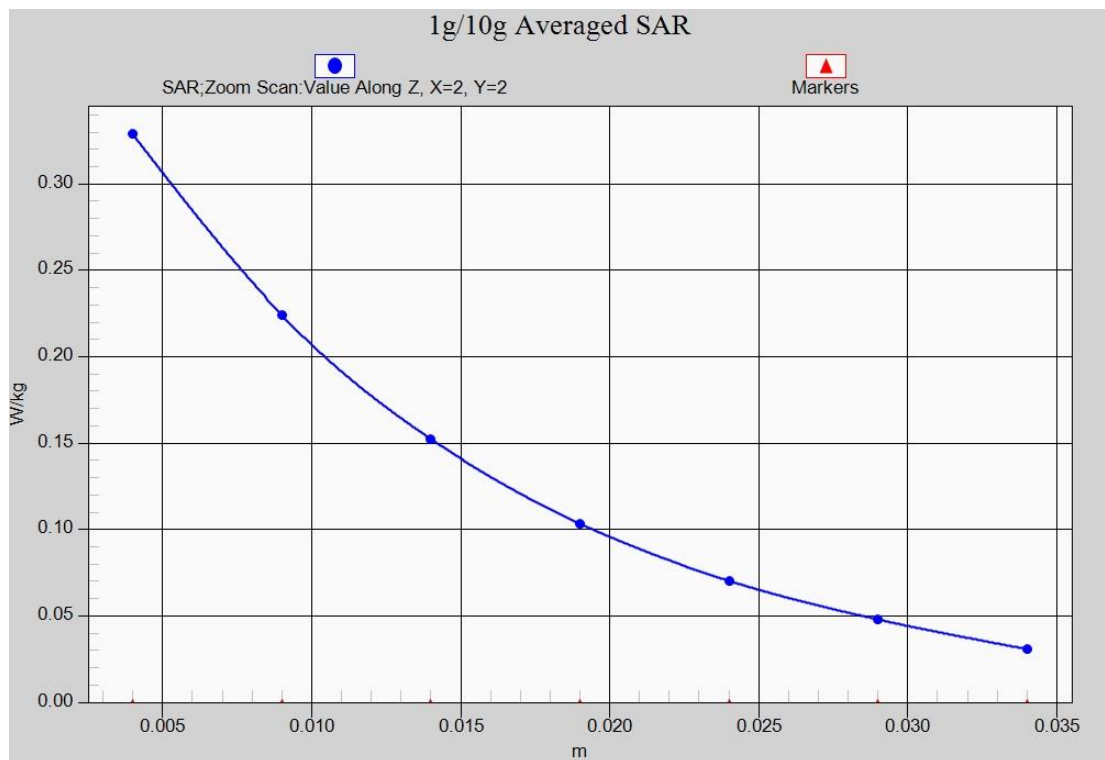


Fig.11-1 Z-Scan at power reference point (Band 4 CH20050)

LTE Band 4 Body Front Low with QPSK_20MHz_1RB_Low

Date/Time: 2017-2-13

Electronics: DAE4 Sn786

Medium: Body 1800 MHz

Medium parameters used: $f = 1720$ MHz; $\sigma = 1.428$ S/m; $\epsilon_r = 53.472$; $\rho = 1000$ kg/m³

Ambient Temperature: 21.8°C Liquid Temperature: 21.3°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (4.95, 4.95, 4.95);

Front side Low 1RB_Low /Area Scan (111x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.634 W/kg

Front side Low 1RB_Low /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.92 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.924 W/kg

SAR(1 g) = 0.574 W/kg; SAR(10 g) = 0.345 W/kg

Maximum value of SAR (measured) = 0.624 W/kg

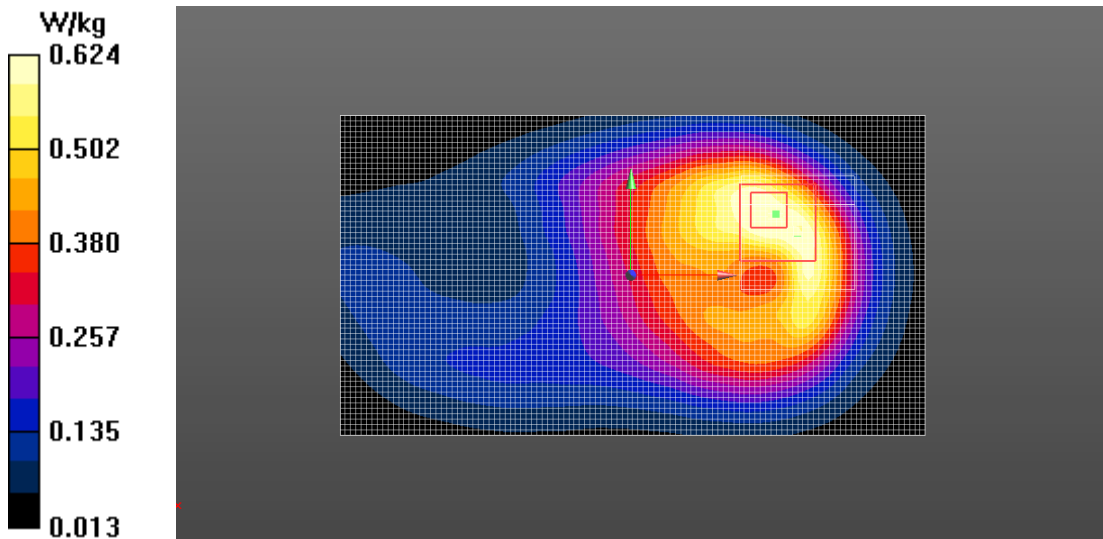


Fig.12 LTE Band 4 CH20050

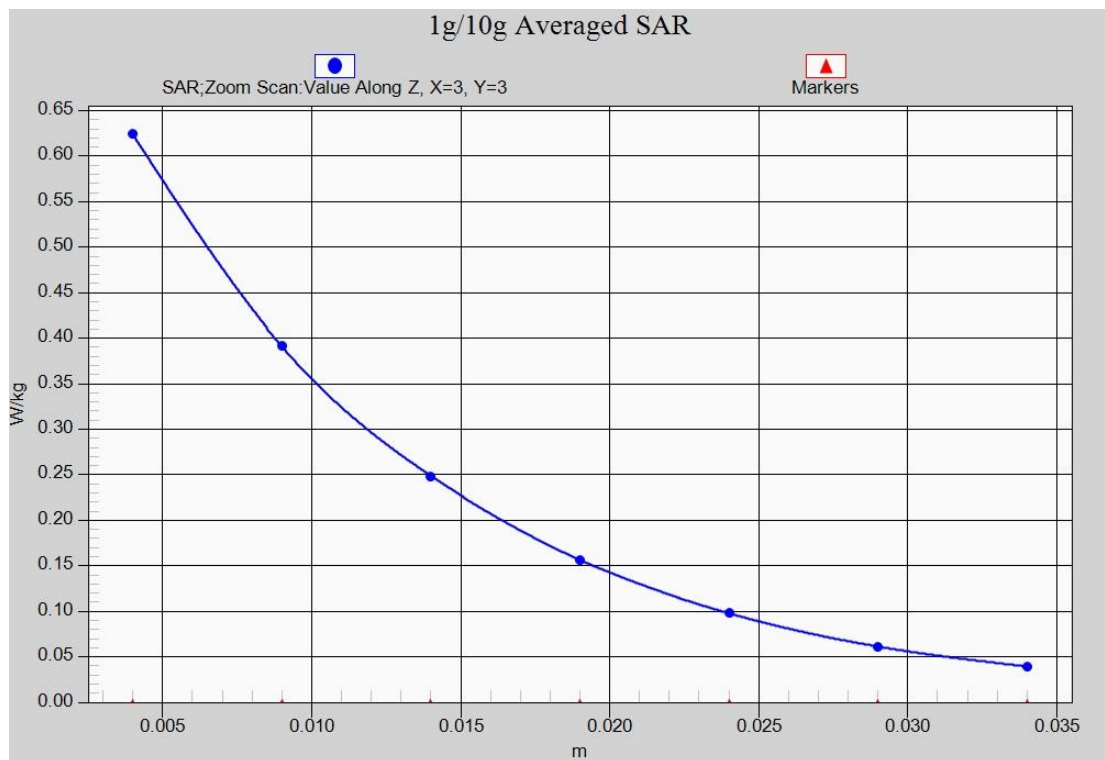


Fig.12-1 Z-Scan at power reference point (Band 4 CH20050)

LTE Band 5 Left Cheek Low with QPSK_10MHz_1RB_ Middle

Date/Time: 2017-2-18

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used: $f = 829$ MHz; $\sigma = 0.880$ S/m; $\epsilon_r = 40.894$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 829 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (6.08, 6.08, 6.08);

Left Cheek Low 1RB_Mid/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.352 W/kg

Left Cheek Low 1RB_Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.115 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.414 W/kg

SAR(1 g) = 0.332 W/kg; SAR(10 g) = 0.253 W/kg

Maximum value of SAR (measured) = 0.348 W/kg

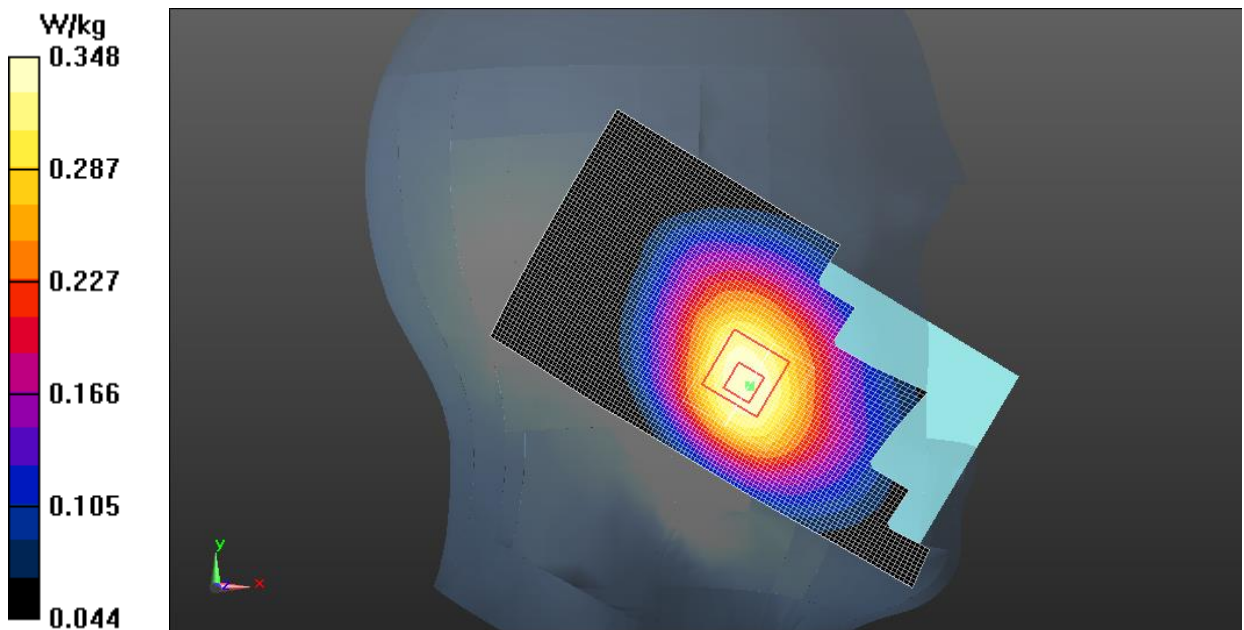


Fig.13 LTE Band 5 CH20450

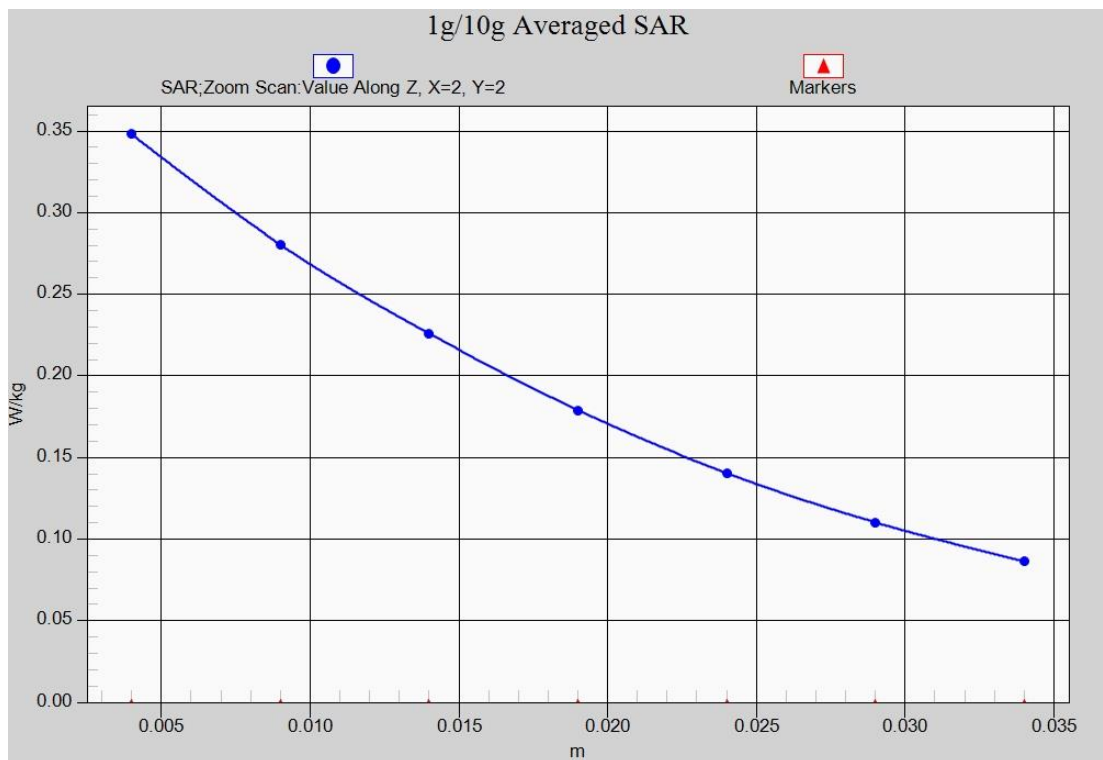


Fig.13-1 Z-Scan at power reference point (Band 5 CH20450)

LTE Band 5 Body Rear Low with QPSK_10MHz_1RB_Middle

Date/Time: 2017-2-18

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used: $f = 829$ MHz; $\sigma = 0.969$ S/m; $\epsilon_r = 55.733$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.4°C Liquid Temperature: 21.9°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 829 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (6.13, 6.13, 6.13);

Rear side Low 1RB_Mid/Area Scan (111x61x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.258 W/kg

Rear side Low 1RB_Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 15.97 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.308 W/kg

SAR(1 g) = 0.246 W/kg; SAR(10 g) = 0.187 W/kg

Maximum value of SAR (measured) = 0.257 W/kg

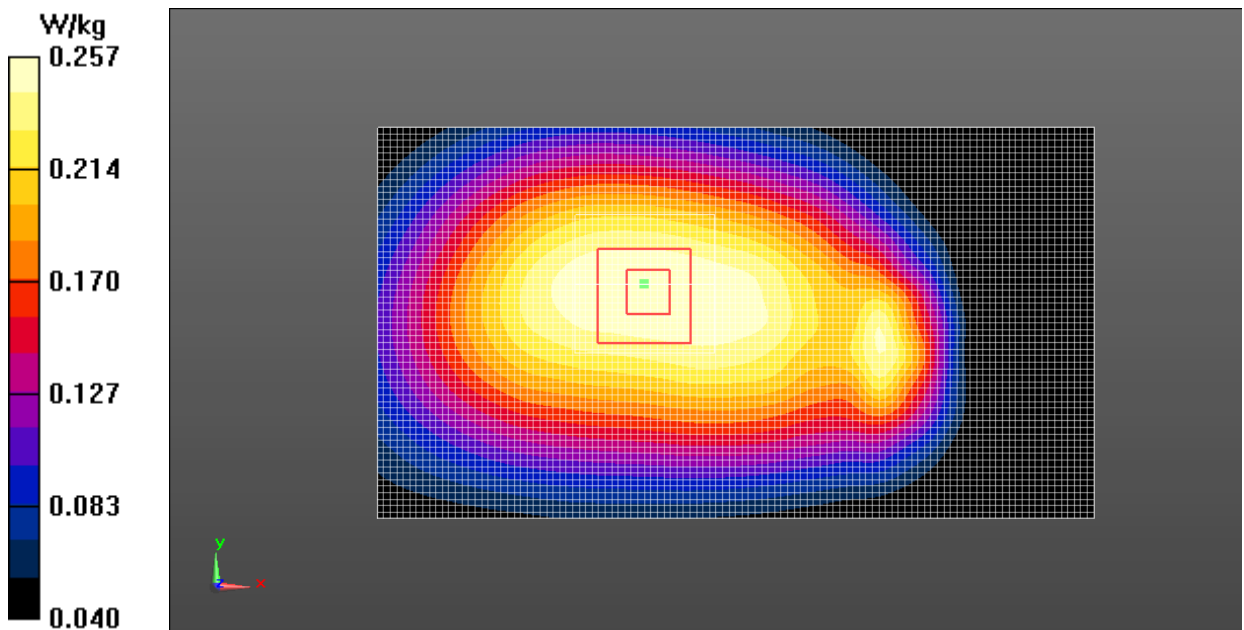


Fig.14 LTE Band 5 CH20450

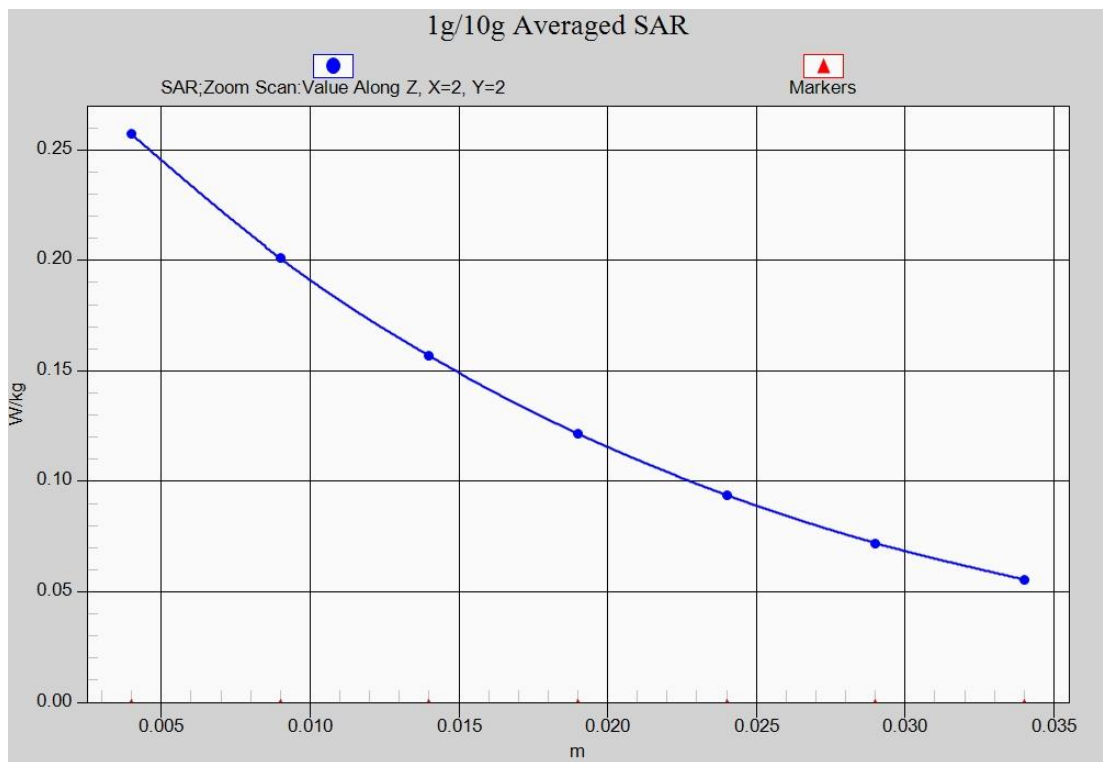


Fig.14-1 Z-Scan at power reference point (Band 5 CH20450)

LTE Band 7 Right Cheek Middle with QPSK_20MHz_1RB_High

Date/Time: 2017-3-15

Electronics: DAE4 Sn786

Medium: Head 2550 MHz

Medium parameters used (interpolated): $f = 2535$ MHz; $\sigma = 1.915$ S/m; $\epsilon_r = 38.724$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 2535 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3151 ConvF (4.43, 4.43, 4.43);

Right Cheek Mid 1RB_High/Area Scan (61x101x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.273 W/kg

Right Cheek Mid 1RB_High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 0.7650 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.425 W/kg

SAR(1 g) = 0.220 W/kg; SAR(10 g) = 0.109 W/kg

Maximum value of SAR (measured) = 0.248 W/kg

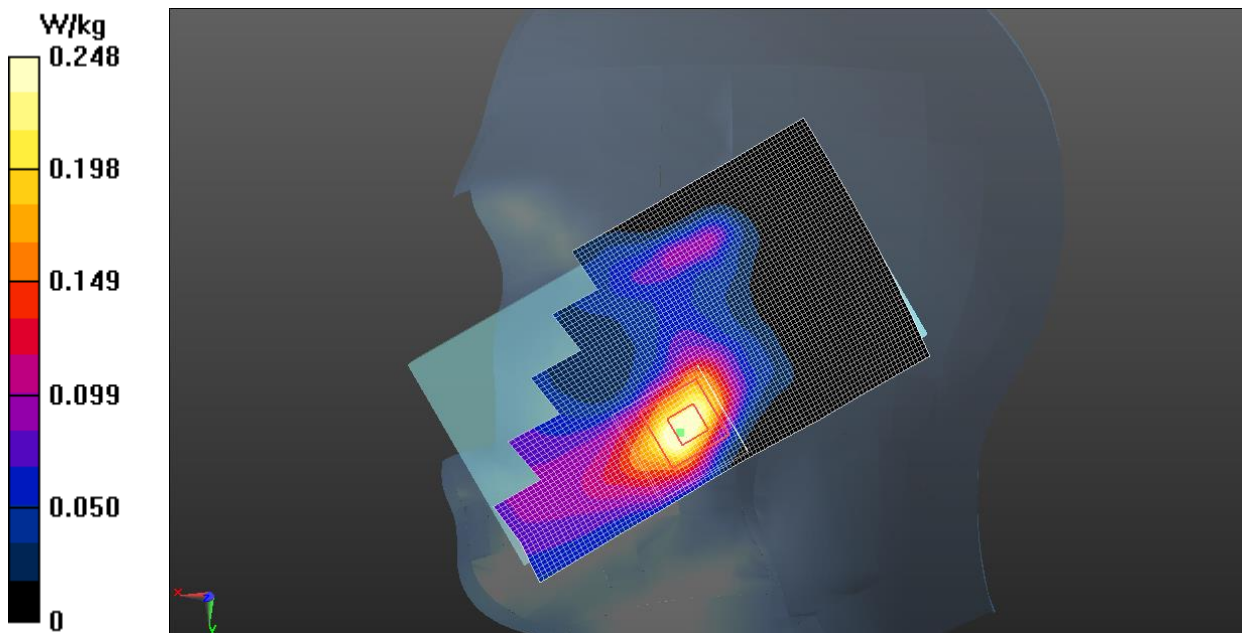


Fig.15 LTE Band 7 CH21100

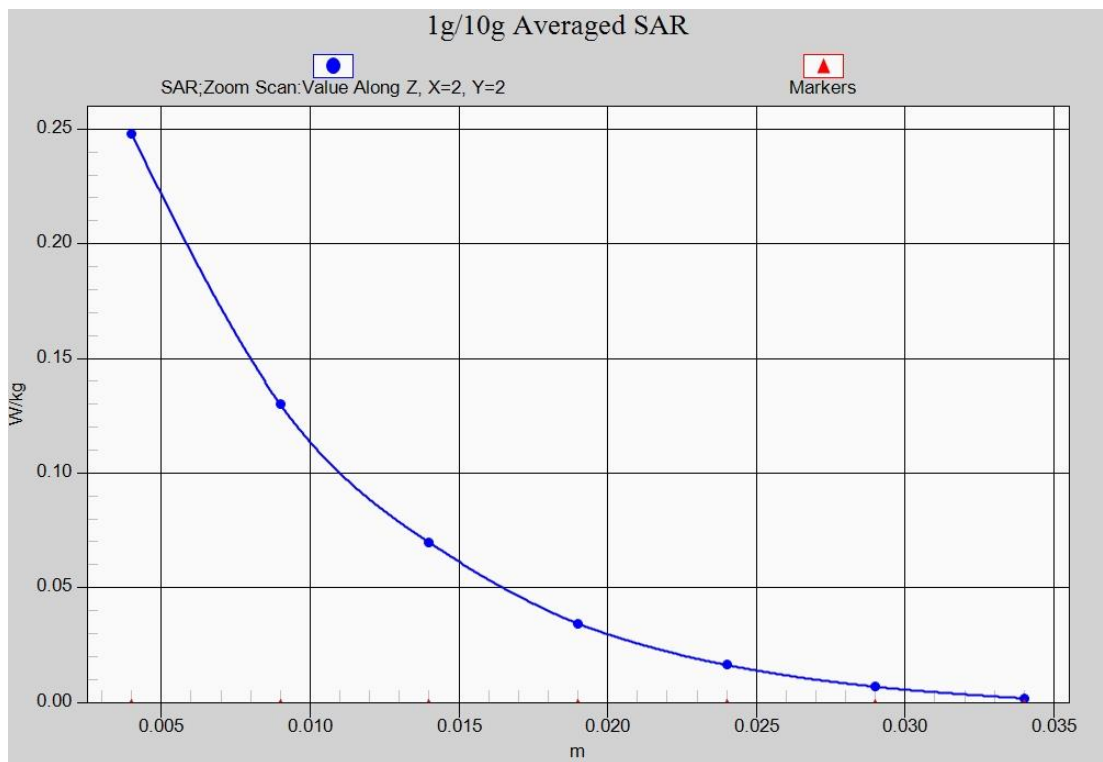


Fig.15-1 Z-Scan at power reference point (Band 7 CH21100)

LTE Band 7 Body Bottom Middle with QPSK_20MHz_1RB_High

Date/Time: 2017-3-15

Electronics: DAE4 Sn786

Medium: Body 2550 MHz

Medium parameters used: $f = 2535$ MHz; $\sigma = 2.029$ S/m; $\epsilon_r = 51.684$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.7°C Liquid Temperature: 22.2°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 2535 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (4.09, 4.09, 4.09);

Bottom side Mid 1RB_High/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.24 W/kg

Bottom side Mid 1RB_High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.11 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.99 W/kg

SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.584 W/kg

Maximum value of SAR (measured) = 1.24 W/kg

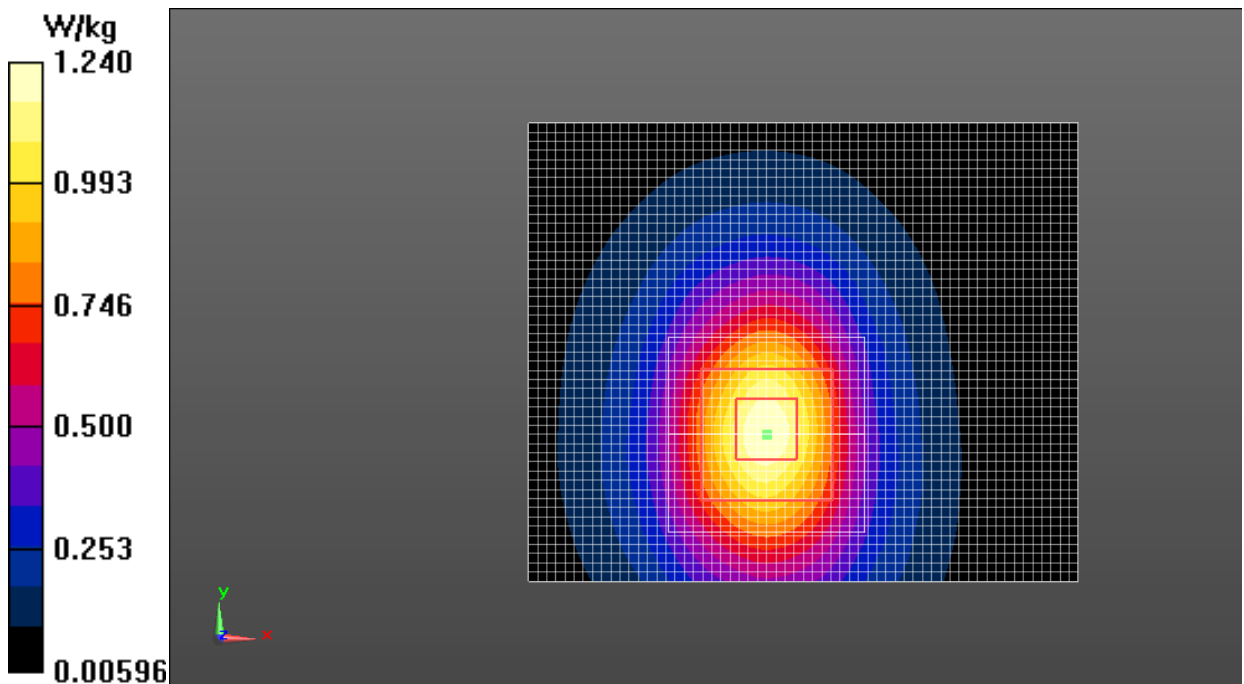


Fig.16 LTE Band 7 CH21100

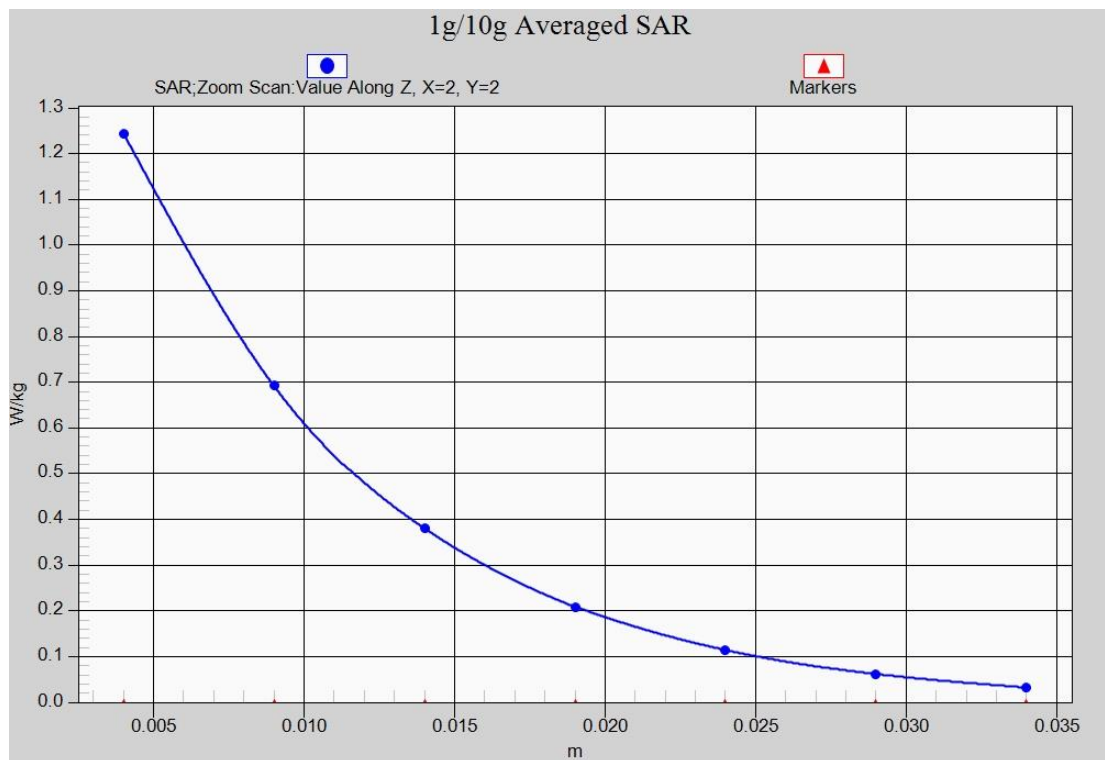


Fig.16-1 Z-Scan at power reference point (Band 7 CH21100)

LTE Band 12 Left Cheek Low with QPSK_10MHz_1RB_Low

Date/Time: 2017-2-22

Electronics: DAE4 Sn786

Medium: Head 750 MHz

Medium parameters used: $f = 704$ MHz; $\sigma = 0.872$ S/m; $\epsilon_r = 41.763$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3151 ConvF (6.34, 6.34, 6.34);

Left Cheek Low 1RB_Low/Area Scan (61x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.161 W/kg

Left Cheek Low 1RB_Low/Zoom Scan (5x5x7)/Cube0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.610 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.181 W/kg

SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.155 W/kg

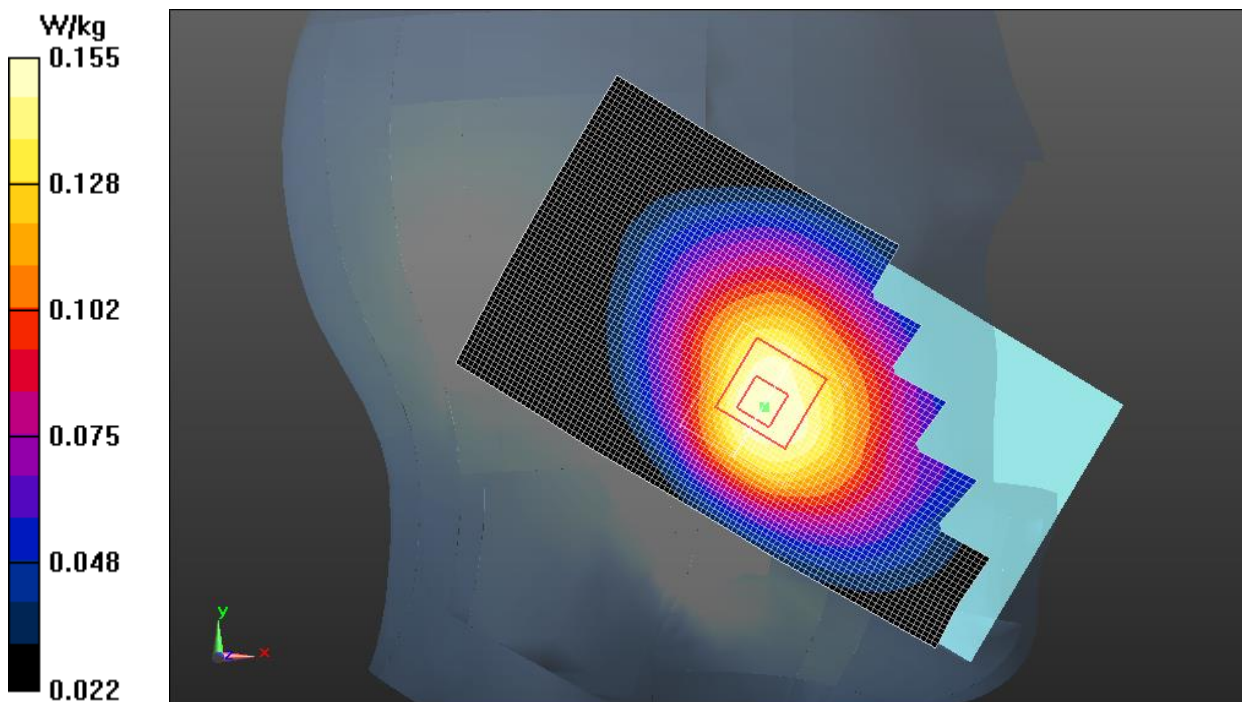


Fig.17 LTE Band 12 CH23060