TESTING
NVLAP LAB CODE 600118-0

SAR TEST REPORT

No. I21Z62705-SEM03

For

TCL Communication Ltd.

GSM/UMTS/LTE Mobile phone

Model Name: 4058R, 4058C

with

Hardware Version: 03

Software Version: NH35

FCC ID: 2ACCJN060

Issued Date: 2022-2-9

Note:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I21Z62705-SEM03	Rev.0	2022-2-9	Initial creation of test report

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

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

1.2 Testing Environment

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

1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Yao Juming
Testing Start Date:	January 19, 2022
Testing End Date:	January 23, 2022

1.4 Signature

Yao Juming

(Prepared this test report)

Qi Dianyuan

(Reviewed this test report)

Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for TCL Communication Ltd. GSM/UMTS/LTE Mobile phone 4058R, 4058C are as follows:

Table 2.1: Highest Reported SAR (1g)

Technology Band	Head	Hotspot	Body-Worn	Equipment Class
GSM850	**1.12**	**1.27**	**1.27**	PCE
GSM1900	**0.24**	**1.27**	**1.27**	
WCDMA1900	**0.39**	**0.99**	**1.16**	
WCDMA 1700	**0.38**	**1.18**	**1.24**	
WCDMA 850	**0.62**	**0.96**	**0.96**	
LTE Band2	**0.30**	**0.88**	**0.84**	
LTE Band4	**0.33**	**1.01**	**1.05**	
LTE Band5	**0.64**	**1.07**	**1.07**	
LTE Band12	**0.45**	**0.79**	**0.79**	
LTE Band14	**0.68**	**1.11**	**1.11**	
WLAN 2.4GHz	**0.60**	**0.19**	**0.11**	DTS

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

For body 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 10/15 mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

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

The measurement together with the test system set-up is described in annex C of this test report. A detailed description of the equipment under test can be found in chapter 4 of this test report. The highest reported SAR value is obtained at the case of **(Table 2.1),** and the values are**:**

Head: 1.12 W/kg (1g)

Body: 1.27 W/kg (1g)

Table 2.2: The sum of SAR values for Main antenna + WiFi-2.4G (1g)

	Position	Main antenna	WiFi-2.4G	Sum
Highest SAR value for Head	Right head, Cheek (GSM850)	1.12	0.28	**1.40**
Highest SAR value for Body	Rear 10mm (GSM850)	1.27	0.19	**1.46**
	Rear 10mm (GSM1900)	1.27	0.19	**1.46**

Table 2.3: The sum of SAR values for main antenna and BT (1g)

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Right head, Cheek (GSM850)	1.12	0.33[1]	**1.45**
Maximum reported SAR value for Body	Rear 10mm (GSM850)	1.27	0.17[1]	**1.44**
	Rear 10mm (GSM1900)	1.27	0.17[1]	**1.44**

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

Conclusion:

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

According to the above tables, the highest sum of reported SAR values is **1.46 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
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Contact Email:	peter.yang@tcl.com
Telephone:	+86 755 3664 5759
Fax:	+86 755 3661 2000-81722

3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact Person:	Peter yang
Contact Email:	peter.yang@tcl.com
Telephone:	+86 755 3664 5759
Fax:	+86 755 3661 2000-81722

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

4.1 About EUT

Description:	GSM/UMTS/LTE Mobile phone
Model name:	4058R, 4058C
Operating mode(s):	GSM850/900/1800/1900, WCDMA850/1700/1900 LTE Band 2/4/5/12/14 BT, Wi-Fi2.4G
Tested Tx Frequency:	824 – 849 MHz (GSM 850)
	1850 – 1910 MHz (GSM 1900)
	824 – 849 MHz (WCDMA 850 Band V)
	1710-1755 MHz (WCDMA1700 Band IV)
	1850 – 1910 MHz (WCDMA1900 Band II)
	1850.7 – 1909.3 MHz (LTE Band 2)
	1710.7 – 1754.3 MHz (LTE Band 4)
	824.7 – 848.3 MHz (LTE Band 5)
	699.7 – 715.3 MHz (LTE Band 12)
	790.5 –795.5 MHz (LTE Band 14)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	2400 – 2483.5 MHz (Bluetooth)
GPRS/EGPRS Multislot Class:	12
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Hotspot mode:	Support

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	016143000006397	03	NH35
EUT2	016143000006379	03	NH35
EUT3	016143000210278	03	NH35

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

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

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	TLi017C7	/	veken

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

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

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

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

5.2 Applicable Measurement Standards

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

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

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

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

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

KDB941225 D06 Hotspot Mode SAR v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

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

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

KDB865664 D02RF Exposure Reporting v01r02: RF Exposure Compliance Reporting and Documentation Considerations

6 Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

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

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

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

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

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

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

Table 7.1: Targets for tissue simulating liquid

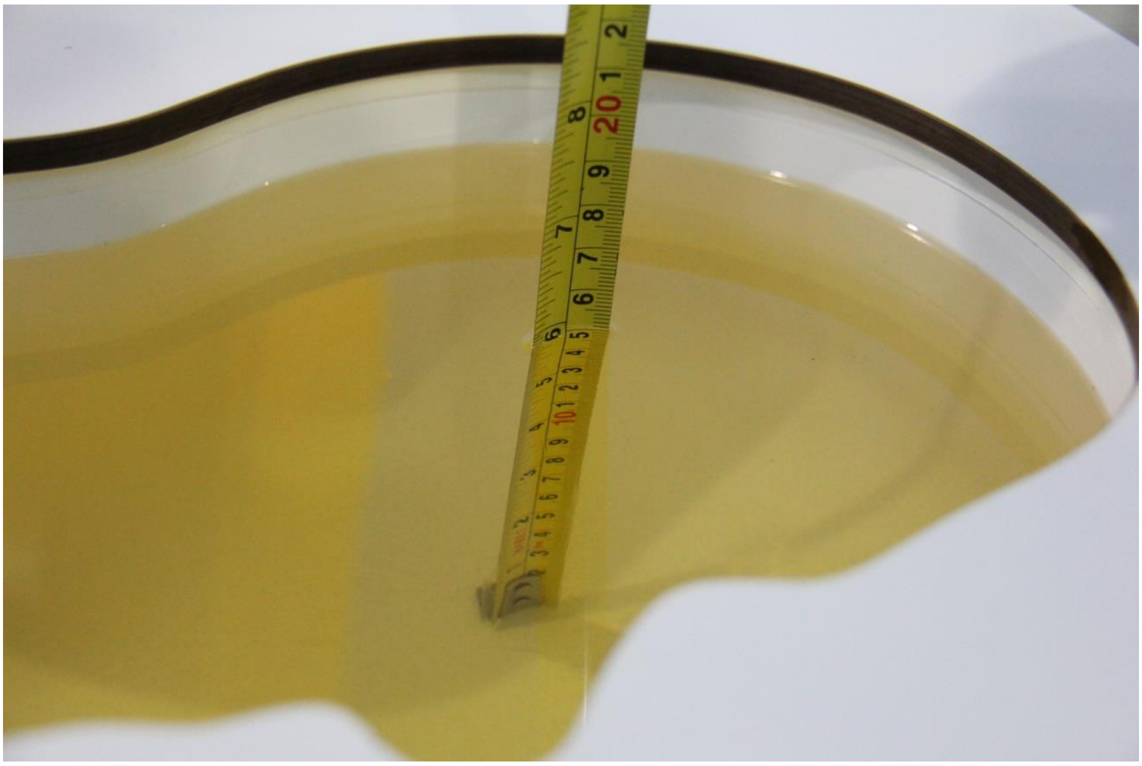
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
1800	Head	1.40	1.33～1.47	40.0	38.0～42.0
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
2450	Head	1.67	1.59～1.75	39.47	37.5～41.4

7.2 Dielectric Performance

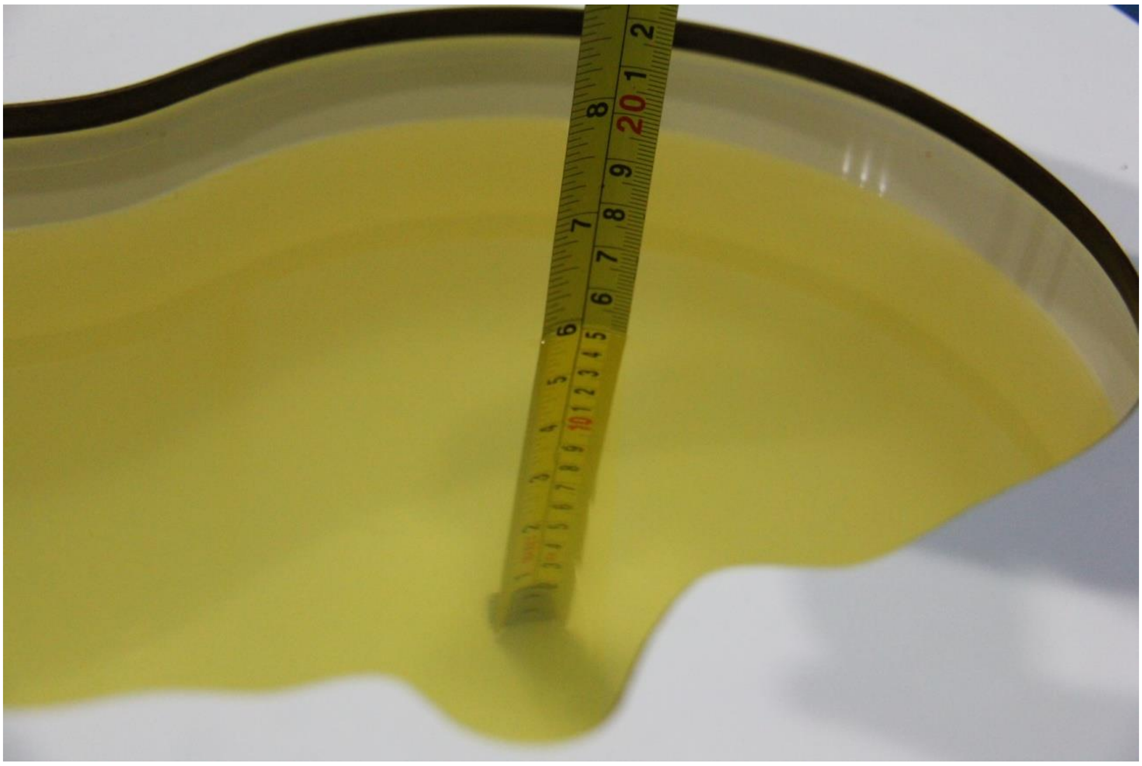
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2022-1-19	Head	750 MHz	45.89	9.42%	0.8459	-4.96%
2022-1-20	Head	835 MHz	45.55	9.76%	0.8797	-2.26%
2022-1-21	Head	1800 MHz	42.96	7.40%	1.459	4.21%
2022-1-22	Head	1900 MHz	42.79	6.98%	1.527	9.07%
2022-1-23	Head	2450 MHz	41.6	6.12%	1.963	9.06%

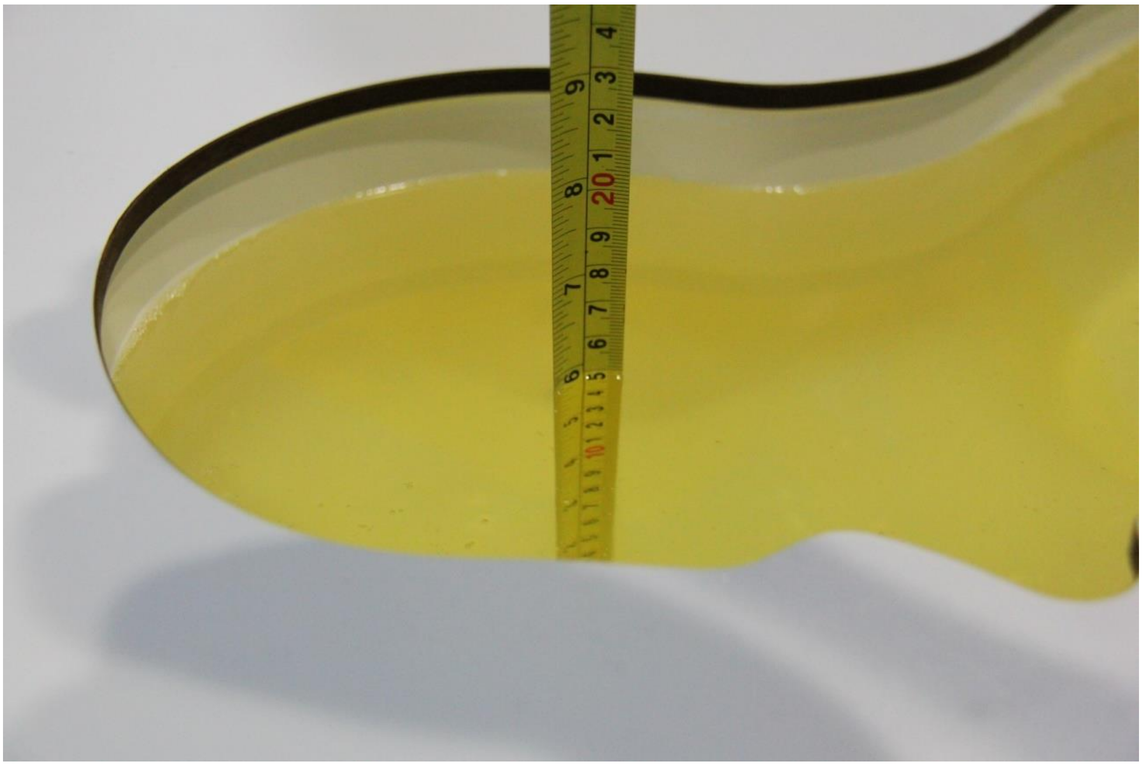
Note: The liquid temperature is 22.0℃



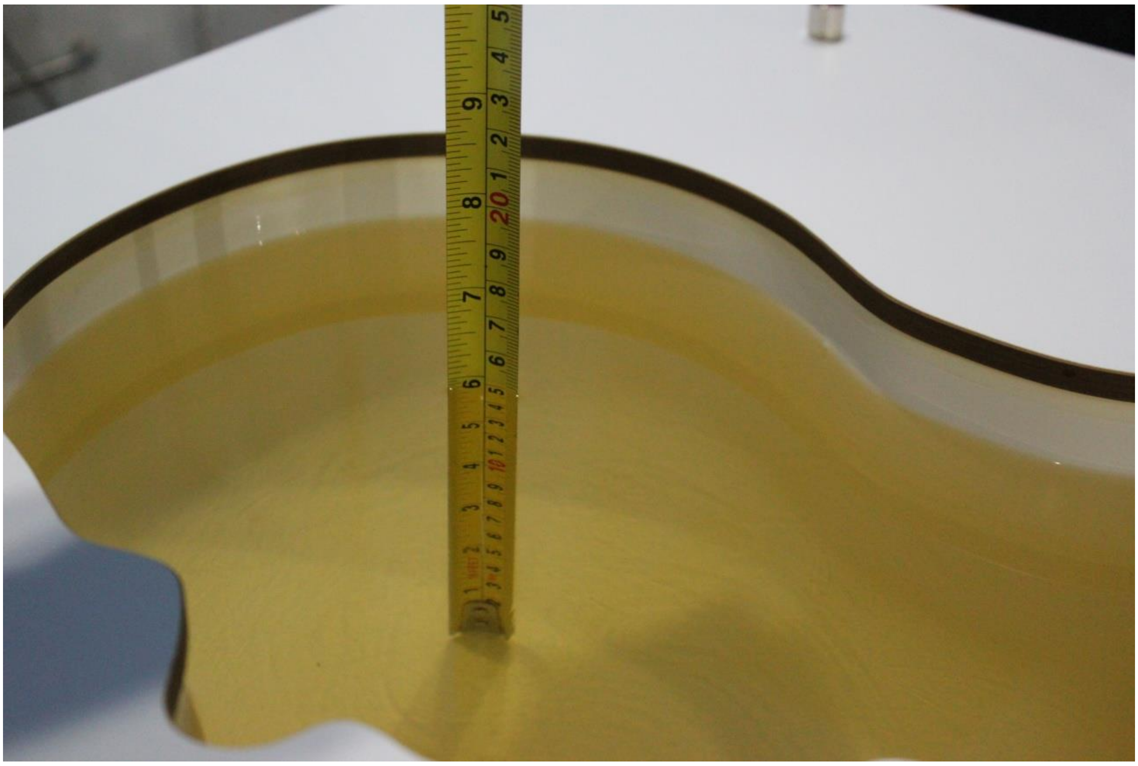
Picture 7-1 Liquid depth in the Head Phantom (835 MHz)



Picture 7-2 Liquid depth in the Head Phantom (1900 MHz)



Picture 7-3 Liquid depth in the Head Phantom (2450MHz)

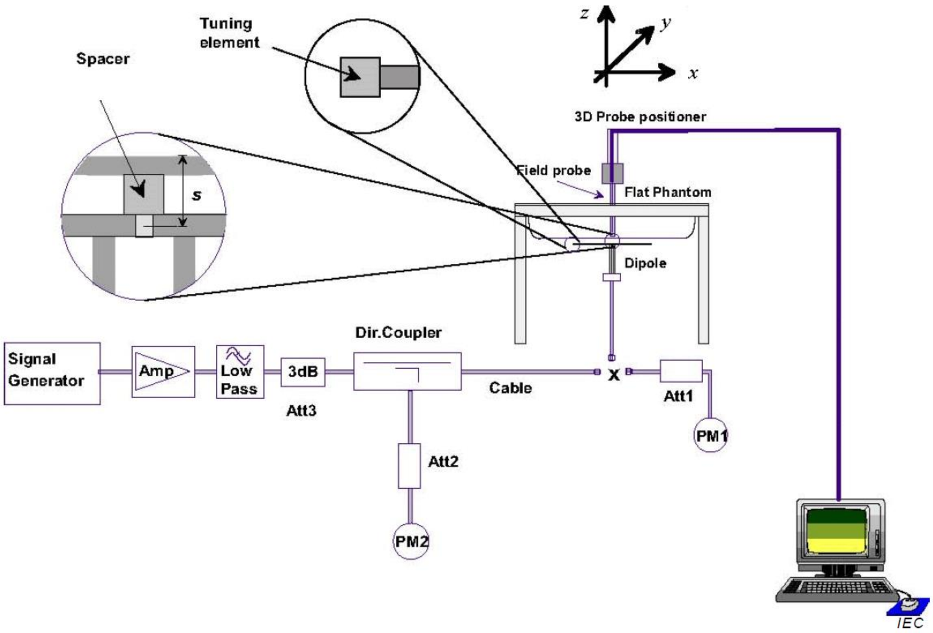


Picture 7-4 Liquid depth in the Head Phantom (750 MHz)

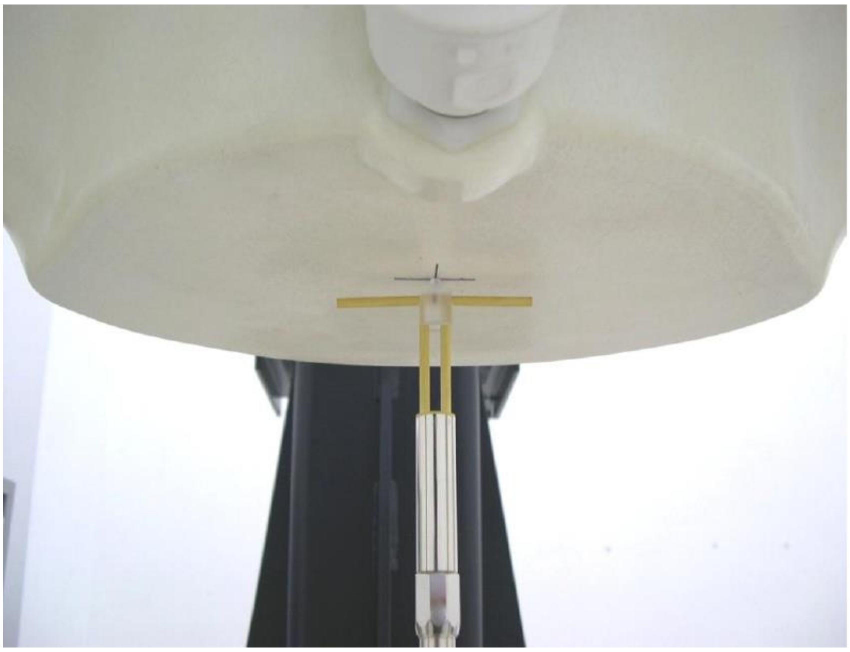
8 System verification

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
2022-1-19	750 MHz	5.65	8.68	5.84	8.92	3.36%	2.76%
2022-1-20	835 MHz	6.24	9.63	6.08	9.52	-2.56%	-1.14%
2022-1-21	1800 MHz	19.9	38.3	20.6	39.1	3.52%	2.04%
2022-1-22	1900 MHz	20.9	40.1	20.5	39.2	-2.01%	-2.34%
2022-1-23	2450 MHz	24.9	53.3	24.6	52.8	-1.20%	-0.86%

9 Measurement Procedures

9.1 Tests to be performed

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

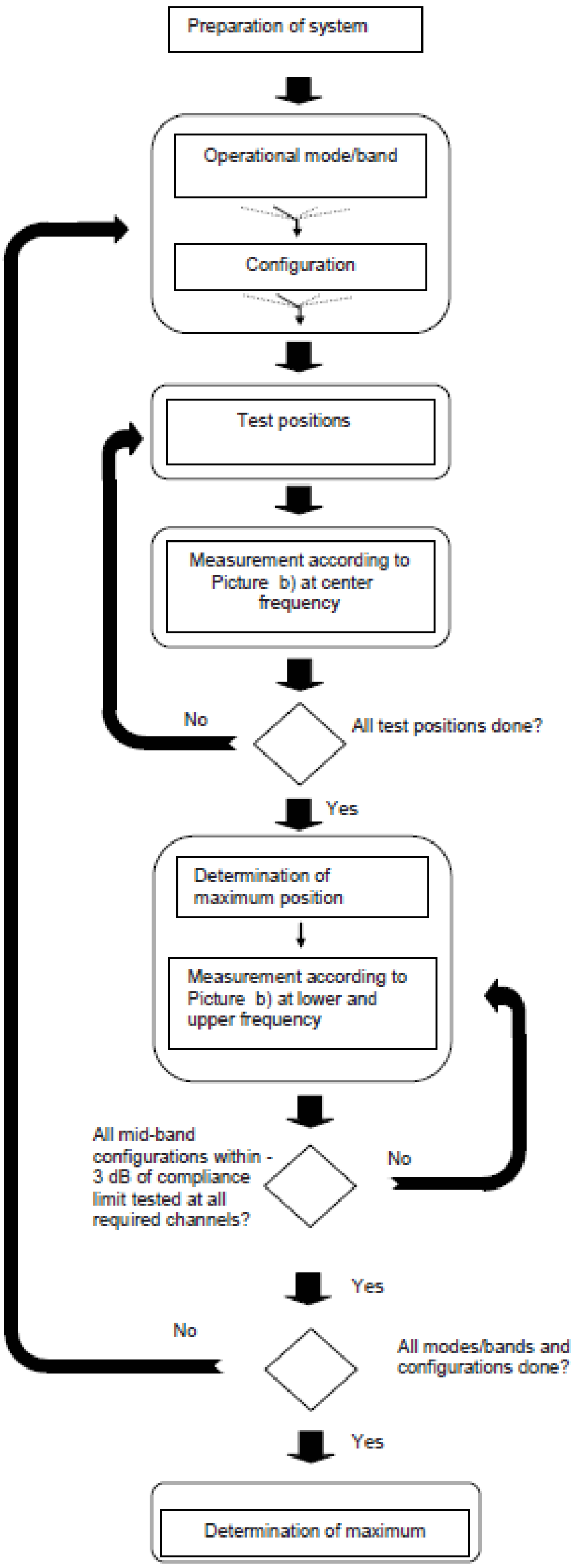
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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

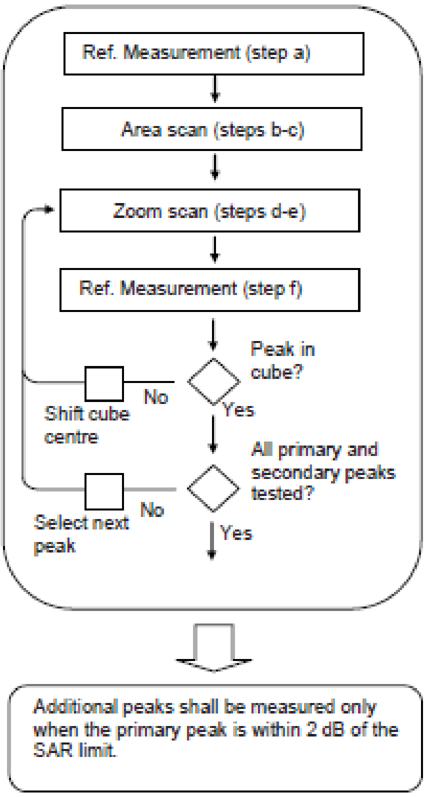
If more than three frequencies need to be tested according to 11.1 (i.e., N_c > 3), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1,perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

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



Picture a – Tests to be performed



Picture b – General procedure

Picture 9.1Block diagram of the tests to be performed

9.2 General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2013. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

<table>
<tr><th colspan="3"></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

9.3 WCDMA Measurement Procedures for SAR

The following procedures are applicable to WCDMA handsets operating under 3GPP Release99, Release 5 and Release 6. The default test configuration is to measure SAR with an established radio link between the DUT and a communication test set using a 12.2kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations (DPCCH & $DPDCH_n$), HSDPA and HSPA (HSUPA/HSDPA) modes according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. SAR for Release 5 HSDPA and Release 6 HSPA are measured using the applicable FRC (fixed reference channel) and E-DCH reference channel configurations. Maximum output power is verified according to applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. When Maximum Power Reduction (MPR) is not implemented according to Cubic Metric (CM) requirements for Release 6 HSPA, the following procedures do not apply.

For Release 5 HSDPA Data Devices:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}	CM/dB
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

For Release 6 HSPA Data Devices

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

Rel.8 DC-HSDPA (Cat 24)

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

9.4 SAR Measurement for LTE

SAR tests for LTE are performed with a base station simulator, Rohde & Rchwarz CMW500. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. All powers were measured with the CMW 500.

It is performed for conducted power and SAR based on the KDB941225 D05.

SAR is evaluated separately according to the following procedures for the different test positions in each exposure condition – head, body, body-worn accessories and other use conditions. The procedures in the following subsections are applied separately to test each LTE frequency band.

1) QPSK with 1 RB allocation

   Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

   The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

   For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

TDD test:

TDD testing is performed using guidance from FCC KDB 941225 D05 and the SAR test guidance provided in April 2013 TCB works hop notes. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211.

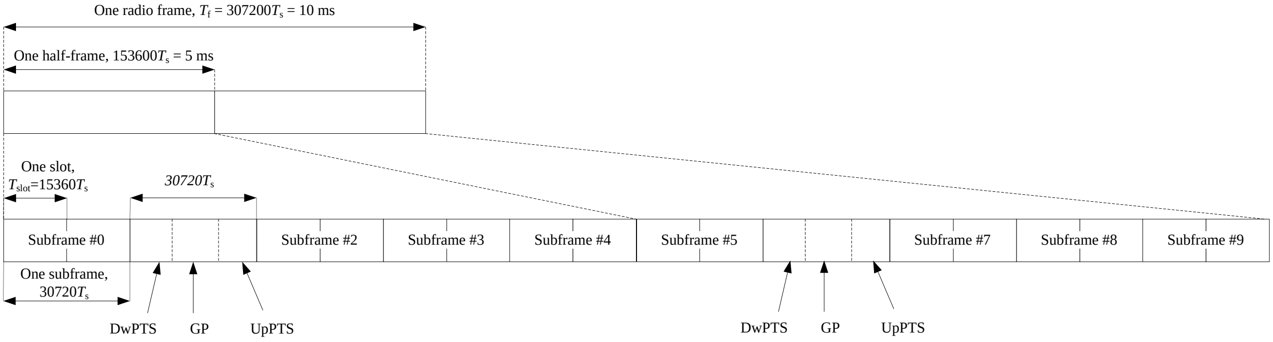


Figure 9.2: Frame structure type 2 (for 5 ms switch-point periodicity)

Table 9.1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

<table>
<tr><th rowspan="3">Special subframe configuration</th><th colspan="3">Normal cyclic prefix in downlink</th><th colspan="3">Extended cyclic prefix in downlink</th></tr>
<tr><th>DwPTS</th><th colspan="2">UpPTS</th><th>DwPTS</th><th colspan="2">UpPTS</th></tr>
<tr><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th></tr>
<tr><td>0</td><td>$6592 \cdot T_s$</td><td rowspan="5">$2192 \cdot T_s$</td><td rowspan="5">$2560 \cdot T_s$</td><td>$7680 \cdot T_s$</td><td rowspan="4">$2192 \cdot T_s$</td><td rowspan="4">$2560 \cdot T_s$</td></tr>
<tr><td>1</td><td>$19760 \cdot T_s$</td><td>$20480 \cdot T_s$</td></tr>
<tr><td>2</td><td>$21952 \cdot T_s$</td><td>$23040 \cdot T_s$</td></tr>
<tr><td>3</td><td>$24144 \cdot T_s$</td><td>$25600 \cdot T_s$</td></tr>
<tr><td>4</td><td>$26336 \cdot T_s$</td><td>$7680 \cdot T_s$</td><td rowspan="4">$4384 \cdot T_s$</td><td rowspan="4">$5120 \cdot T_s$</td></tr>
<tr><td>5</td><td>$6592 \cdot T_s$</td><td rowspan="5">$4384 \cdot T_s$</td><td rowspan="5">$5120 \cdot T_s$</td><td>$20480 \cdot T_s$</td></tr>
<tr><td>6</td><td>$19760 \cdot T_s$</td><td>$23040 \cdot T_s$</td></tr>
<tr><td>7</td><td>$21952 \cdot T_s$</td><td>$12800 \cdot T_s$</td></tr>
<tr><td>8</td><td>$24144 \cdot T_s$</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>9</td><td>$13168 \cdot T_s$</td><td>-</td><td>-</td><td>-</td></tr>
</table>

Table 9.2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Duty factor is calculated by:

Duty factor = uplink frame*6+UpPTS*2/one frame length

= (30720.T_s * 6+5120. T_s*2)/307200.T_s

= 0.633

9.5 Bluetooth & Wi-Fi Measurement Procedures for SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

9.6 Power Drift

To control the output power stability during the SAR test, 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 section14 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 Bioelectromagnetics Society meeting (2007) and the estimated 1-gSAR is ≤ 1.2 W/kg, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

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

10.2 Fast SAR Algorithms

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

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

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

Both algorithms are implemented in DASY software.

11 Conducted Output Power

Table11: Summary of Receiver detection mechanism

Antenna	Receiver on (head scenario)	Receiver off + Hotspot off (Body scenario)	Receiver off + Hotspot on (Hotspot scenario)
Main Antenna	Power Level A1	Power Level B1	Power Level C1

For WWAN, When the phone is in body mode (receiver off) and hotspot worked, then power reduction will be implemented immediately at WCDMA B2/B4 and LTEB2/B4.

11.1 GSM Measurement result

Table 11.1-1: The conducted power measurement results-GSM850 Power Level A1/B1/C1

GSM 850 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	31.48	31.43	31.35	33.00	/	/	/	/
GSM 850 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	31.40	31.35	31.27	33.00	-9.03	22.37	22.32	22.24
2 Txslots	30.73	30.69	30.60	31.00	-6.02	24.71	24.67	24.58
3 Txslots	29.01	29.00	28.95	29.50	-4.26	24.75	24.74	24.69
4 Txslots	27.78	27.79	27.76	28.00	-3.01	24.77	24.78	24.75
GSM 850 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	31.42	31.35	31.26	33.00	-9.03	22.39	22.32	22.23
2 Txslots	30.73	30.69	30.58	31.00	-6.02	24.71	24.67	24.56
3 Txslots	29.00	28.99	28.94	29.50	-4.26	24.74	24.73	24.68
4 Txslots	27.78	27.78	27.75	28.00	-3.01	24.77	24.77	24.74
GSM 850 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	25.94	25.23	25.42	27.00	-9.03	16.91	16.20	16.39
2 Txslots	24.31	24.72	24.72	25.00	-6.02	18.29	18.70	18.70
3Txslots	22.14	22.33	22.42	23.00	-4.26	17.88	18.07	18.16
4 Txslots	21.01	21.15	21.31	22.00	-3.01	18.00	18.14	18.30

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 GSM850.

Table 11.1-2: The conducted power measurement results-GSM1900 Power Level A1/B1/C1

PCS1900 Speech (GMSK)	Measured timeslot-averaged output power (dBm)			Tune up	calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	28.52	28.21	28.22	30.00	/	/	/	/
PCS1900 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	28.55	28.22	28.23	29.00	-9.03	19.52	19.19	19.20
2 Txslots	27.41	27.35	27.38	27.80	-6.02	21.39	21.33	21.36
3 Txslots	25.52	25.41	25.44	26.50	-4.26	21.26	21.15	21.18
4 Txslots	24.35	24.24	24.24	25.00	-3.01	21.34	21.23	21.23
PCS1900 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	28.52	28.20	28.21	29.00	-9.03	19.49	19.17	19.18
2 Txslots	27.68	27.32	27.35	28.00	-6.02	21.66	21.30	21.33
3Txslots	25.79	25.38	25.41	26.00	-4.26	21.53	21.12	21.15
4 Txslots	24.33	24.21	24.22	25.00	-3.01	21.32	21.20	21.21
PCS1900 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	24.75	24.32	24.23	25.50	-9.03	15.72	15.29	15.20
2 Txslots	23.72	23.31	23.43	24.50	-6.02	17.70	17.29	17.41
3Txslots	21.72	21.49	21.20	22.50	-4.26	17.46	17.23	16.94
4 Txslots	20.85	20.18	20.09	21.50	-3.01	17.84	17.17	17.08

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 2Txslots for GSM1900.

11.2 WCDMA Measurement result

Table 11.2-1: The conducted Power for WCDMA Band5-Power Level A1/B1/C1

WCDMA850	Sub test	FDDV result (dBm)			Tune up
		4233/4458 (846.6MHz)	4183/4408 (836.6MHz)	4132/4357 (826.4MHz)	
	/	23.26	23.29	23.16	23.50
HSUPA	1	20.38	20.31	20.36	21.00
	2	20.40	20.37	20.35	21.50
	3	20.91	20.95	20.95	21.50
	4	19.47	19.49	19.45	20.50
	5	20.94	20.93	20.96	22.00
DC-HSDPA	1	22.39	22.37	22.35	23.00
	2	22.13	22.09	22.17	23.00
	3	21.83	21.80	21.82	22.50
	4	21.79	21.83	21.86	22.50

Table 11.2-2: The conducted Power for WCDMA Band2-Power Level A1/B1

WCDMA1900	Sub test	FDDII result (dBm)			Tune up
		9538/9938 (1907.6MHz)	9400/9800 (1880MHz)	9262/9662 (1852.4MHz)	
	/	22.98	22.97	22.95	23.50
HSUPA	1	20.26	20.09	20.23	21.00
	2	20.27	20.12	20.26	21.00
	3	21.21	21.09	21.27	22.00
	4	19.77	19.63	19.63	20.50
	5	21.18	21.10	21.02	22.00
DC-HSDPA	1	22.07	22.12	22.02	23.00
	2	22.06	22.01	22.03	23.00
	3	21.53	21.54	21.56	22.00
	4	21.54	21.58	21.56	22.00

Table 11.2-3: The conducted Power for WCDMA Band2-Power Level C1

WCDMA1900	Sub test	FDDII result (dBm)			Tune up
		9538/9938 (1907.6MHz)	9400/9800 (1880MHz)	9262/9662 (1852.4MHz)	
	/	20.40	20.32	20.16	21.00
HSUPA	1	17.11	17.12	17.10	18.00
	2	17.11	17.18	17.14	18.00
	3	18.10	18.01	17.96	19.00
	4	16.49	16.48	16.47	17.50
	5	18.11	18.00	17.93	19.00
DC-HSDPA	1	19.10	19.06	19.03	20.00
	2	18.86	18.84	18.88	19.50
	3	18.55	18.50	18.51	19.00
	4	17.67	17.51	17.60	18.00

Table 11.2-4: The conducted Power for WCDMA Band4-Power Level A1/B1

WCDMA1700	Sub test	FDDIV result (dBm)			Tune up
		1513/1738 (1752.6MHz)	1412/1637 (1732.4MHz)	1312/1537 (1712.4MHz)	
	/	22.83	22.82	22.92	23.50
HSUPA	1	20.04	20.05	20.01	21.00
	2	19.99	19.92	19.97	21.00
	3	20.38	20.40	20.34	21.00
	4	19.79	19.87	19.83	20.50
	5	20.43	20.37	20.35	21.00
DC-HSDPA	1	21.89	21.95	21.97	22.50
	2	21.80	21.82	21.74	22.50
	3	21.50	21.39	21.46	22.50
	4	21.35	21.47	21.44	22.50

Table 11.2-5: The conducted Power for WCDMA Band4-Power Level C1

WCDMA1700	Sub test	FDDIV result (dBm)			Tune up
		1513/1738 (1752.6MHz)	1412/1637 (1732.4MHz)	1312/1537 (1712.4MHz)	
	/	20.05	20.08	20.10	20.50
HSUPA	1	16.76	16.90	16.88	17.50
	2	16.91	16.93	16.92	17.50
	3	17.90	17.92	17.96	18.50
	4	16.51	16.46	16.48	17.50
	5	17.80	17.94	17.89	18.50
DC-HSDPA	1	18.82	18.93	18.92	19.50
	2	18.80	18.84	18.84	19.50
	3	18.38	18.48	18.40	19.00
	4	17.63	17.70	17.62	18.50

11.3 LTE Measurement result

Maximum Target Power for Production Unit – Power Level A1/B1/C1

Band	Tune up (dBm)		
	Receiver on (head scenario)	**Receiver off + Hotspot off (Body scenario)**	**Receiver off + Hotspot on (Hotspot scenario)**
	Level A1	Level B1	Level C1
Band 2	23.5	23.5	20.5
Band 4	23.5	23.5	20.5
Band 5	24	24	24
Band 12	24.5	24.5	24.5
Band 14	24.5	24.5	24.5

LTE B2-Power Level A1/B1				
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
1.4MHz	1RB-High (5)	1909.3 (19193)	22.61	21.88
		1880 (18900)	22.62	21.92
		1850.7 (18607)	22.45	21.73
	1RB-Middle (3)	1909.3 (19193)	22.76	22.01
		1880 (18900)	22.72	22.03
		1850.7 (18607)	22.60	21.76
	1RB-Low (0)	1909.3 (19193)	22.63	21.82
		1880 (18900)	22.62	21.87
		1850.7 (18607)	22.46	21.68
	3RB-High (3)	1909.3 (19193)	22.69	21.72
		1880 (18900)	22.70	21.67
		1850.7 (18607)	22.55	21.49
	3RB-Middle (1)	1909.3 (19193)	22.76	21.76
		1880 (18900)	22.75	21.77
		1850.7 (18607)	22.56	21.59
	3RB-Low (0)	1909.3 (19193)	22.67	21.65
		1880 (18900)	22.68	21.70
		1850.7 (18607)	22.54	21.58
	6RB (0)	1909.3 (19193)	21.69	20.72
		1880 (18900)	21.68	20.73
		1850.7 (18607)	21.52	20.59
3MHz	1RB-High (14)	1908.5 (19185)	22.69	21.99
		1880 (18900)	22.73	22.00
		1851.5 (18615)	22.58	21.87
	1RB-Middle (7)	1908.5 (19185)	22.83	22.21
		1880 (18900)	22.85	22.16
		1851.5 (18615)	22.63	22.05
	1RB-Low (0)	1908.5 (19185)	22.69	22.02
		1880 (18900)	22.69	21.97
		1851.5 (18615)	22.55	21.72
	8RB-High (7)	1908.5 (19185)	21.72	20.76
		1880 (18900)	21.72	20.74
		1851.5 (18615)	21.56	20.61
	8RB-Middle (4)	1908.5 (19185)	21.77	20.79
		1880 (18900)	21.77	20.77
		1851.5 (18615)	21.56	20.60
	8RB-Low (0)	1908.5 (19185)	21.73	20.79
		1880 (18900)	21.71	20.72
		1851.5 (18615)	21.54	20.60
	15RB (0)	1908.5 (19185)	21.72	20.69
		1880 (18900)	21.70	20.69
		1851.5 (18615)	21.54	20.53

5MHz	1RB-High (24)	1907.5 (19175)	22.67	21.79
		1880 (18900)	22.63	21.91
		1852.5 (18625)	22.47	21.67
	1RB-Middle (12)	1907.5 (19175)	23.01	22.17
		1880 (18900)	22.95	22.12
		1852.5 (18625)	22.72	21.99
	1RB-Low (0)	1907.5 (19175)	22.57	21.85
		1880 (18900)	22.61	21.90
		1852.5 (18625)	22.47	21.72
	12RB-High (13)	1907.5 (19175)	21.73	20.73
		1880 (18900)	21.73	20.74
		1852.5 (18625)	21.62	20.61
	12RB-Middle (6)	1907.5 (19175)	21.81	20.79
		1880 (18900)	21.80	20.79
		1852.5 (18625)	21.59	20.61
	12RB-Low (0)	1907.5 (19175)	21.71	20.68
		1880 (18900)	21.68	20.69
		1852.5 (18625)	21.56	20.53
	25RB (0)	1907.5 (19175)	21.76	20.73
		1880 (18900)	21.76	20.72
		1852.5 (18625)	21.59	20.54
10MHz	1RB-High (49)	1905 (19150)	23.23	21.90
		1880 (18900)	22.72	21.92
		1855 (18650)	22.60	21.85
	1RB-Middle (24)	1905 (19150)	23.36	22.09
		1880 (18900)	22.88	22.10
		1855 (18650)	22.72	21.89
	1RB-Low (0)	1905 (19150)	23.28	21.98
		1880 (18900)	22.73	22.01
		1855 (18650)	22.59	21.79
	25RB-High (25)	1905 (19150)	22.24	20.81
		1880 (18900)	21.86	20.80
		1855 (18650)	21.69	20.62
	25RB-Middle (12)	1905 (19150)	22.01	20.82
		1880 (18900)	21.81	20.77
		1855 (18650)	21.66	20.63
	25RB-Low (0)	1905 (19150)	21.97	20.80
		1880 (18900)	21.81	20.77
		1855 (18650)	21.57	20.56
	50RB (0)	1905 (19150)	21.97	20.81
		1880 (18900)	21.81	20.75
		1855 (18650)	21.67	20.62

15MHz	1RB-High (74)	1902.5 (19125)	23.26	22.46
		1880 (18900)	23.24	22.49
		1857.5 (18675)	23.12	22.34
	1RB-Middle (37)	1902.5 (19125)	23.38	22.45
		1880 (18900)	23.37	22.44
		1857.5 (18675)	23.22	22.45
	1RB-Low (0)	1902.5 (19125)	23.26	22.48
		1880 (18900)	23.22	22.50
		1857.5 (18675)	23.06	22.16
	36RB-High (38)	1902.5 (19125)	22.38	21.35
		1880 (18900)	22.36	21.33
		1857.5 (18675)	22.23	21.20
	36RB-Middle (19)	1902.5 (19125)	22.41	21.37
		1880 (18900)	22.35	21.32
		1857.5 (18675)	22.20	21.17
	36RB-Low (0)	1902.5 (19125)	22.40	21.36
		1880 (18900)	22.33	21.29
		1857.5 (18675)	22.11	21.10
	75RB (0)	1902.5 (19125)	22.42	21.36
		1880 (18900)	22.39	21.33
		1857.5 (18675)	22.21	21.15
20MHz	1RB-High (99)	1900 (19100)	22.77	22.05
		1880 (18900)	22.79	22.08
		1860 (18700)	22.72	22.01
	1RB-Middle (50)	1900 (19100)	23.14	22.48
		1880 (18900)	23.15	22.43
		1860 (18700)	23.10	22.37
	1RB-Low (0)	1900 (19100)	22.79	22.11
		1880 (18900)	22.78	22.12
		1860 (18700)	22.65	21.98
	50RB-High (50)	1900 (19100)	22.09	21.10
		1880 (18900)	22.10	21.11
		1860 (18700)	21.99	20.98
	50RB-Middle (25)	1900 (19100)	22.13	21.14
		1880 (18900)	22.14	21.08
		1860 (18700)	21.99	20.98
	50RB-Low (0)	1900 (19100)	22.11	21.12
		1880 (18900)	22.06	21.01
		1860 (18700)	21.87	20.85
	100RB (0)	1900 (19100)	22.12	21.10
		1880 (18900)	22.07	21.06
		1860 (18700)	21.92	20.87

LTE B2-Power Level C1				
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
1.4MHz	1RB-High (5)	1909.3 (19193)	19.85	19.99
		1880 (18900)	19.87	19.62
		1850.7 (18607)	19.73	19.60
	1RB-Middle (3)	1909.3 (19193)	20.02	20.03
		1880 (18900)	20.01	19.76
		1850.7 (18607)	19.80	19.78
	1RB-Low (0)	1909.3 (19193)	19.84	19.60
		1880 (18900)	19.87	19.72
		1850.7 (18607)	19.75	19.65
	3RB-High (3)	1909.3 (19193)	19.86	19.51
		1880 (18900)	19.99	19.47
		1850.7 (18607)	19.86	19.41
	3RB-Middle (1)	1909.3 (19193)	19.94	19.57
		1880 (18900)	19.89	19.55
		1850.7 (18607)	19.84	19.41
	3RB-Low (0)	1909.3 (19193)	19.77	19.50
		1880 (18900)	19.94	19.53
		1850.7 (18607)	19.77	19.39
	6RB (0)	1909.3 (19193)	19.72	19.56
		1880 (18900)	19.95	19.58
		1850.7 (18607)	19.83	19.46
3MHz	1RB-High (14)	1908.5 (19185)	19.92	20.04
		1880 (18900)	19.94	19.66
		1851.5 (18615)	19.89	19.63
	1RB-Middle (7)	1908.5 (19185)	20.06	19.97
		1880 (18900)	20.09	19.84
		1851.5 (18615)	20.00	19.85
	1RB-Low (0)	1908.5 (19185)	19.95	19.84
		1880 (18900)	19.93	19.77
		1851.5 (18615)	19.74	19.71
	8RB-High (7)	1908.5 (19185)	19.94	19.55
		1880 (18900)	19.95	19.50
		1851.5 (18615)	19.86	19.43
	8RB-Middle (4)	1908.5 (19185)	19.99	19.58
		1880 (18900)	20.01	19.55
		1851.5 (18615)	19.90	19.47
	8RB-Low (0)	1908.5 (19185)	19.93	19.58
		1880 (18900)	19.97	19.54
		1851.5 (18615)	19.80	19.44
	15RB (0)	1908.5 (19185)	19.97	19.50
		1880 (18900)	19.95	19.47
		1851.5 (18615)	19.87	19.38

5MHz	1RB-High (24)	1907.5 (19175)	19.80	20.01
		1880 (18900)	19.83	19.55
		1852.5 (18625)	19.75	19.60
	1RB-Middle (12)	1907.5 (19175)	20.15	20.30
		1880 (18900)	20.14	19.90
		1852.5 (18625)	20.00	19.94
	1RB-Low (0)	1907.5 (19175)	19.87	20.10
		1880 (18900)	19.87	19.68
		1852.5 (18625)	19.78	19.63
	12RB-High (13)	1907.5 (19175)	19.90	19.85
		1880 (18900)	19.96	19.58
		1852.5 (18625)	19.88	19.46
	12RB-Middle (6)	1907.5 (19175)	20.00	19.80
		1880 (18900)	19.99	19.56
		1852.5 (18625)	19.90	19.52
	12RB-Low (0)	1907.5 (19175)	19.96	19.72
		1880 (18900)	19.97	19.52
		1852.5 (18625)	19.84	19.34
	25RB (0)	1907.5 (19175)	19.97	19.55
		1880 (18900)	19.99	19.61
		1852.5 (18625)	19.89	19.39
10MHz	1RB-High (49)	1905 (19150)	19.64	19.91
		1880 (18900)	19.61	19.76
		1855 (18650)	19.47	19.75
	1RB-Middle (24)	1905 (19150)	19.74	20.09
		1880 (18900)	19.79	20.05
		1855 (18650)	19.57	19.96
	1RB-Low (0)	1905 (19150)	19.63	19.94
		1880 (18900)	19.60	19.92
		1855 (18650)	19.45	19.81
	25RB-High (25)	1905 (19150)	19.76	19.74
		1880 (18900)	19.70	19.74
		1855 (18650)	19.52	19.58
	25RB-Middle (12)	1905 (19150)	19.74	19.72
		1880 (18900)	19.68	19.71
		1855 (18650)	19.54	19.54
	25RB-Low (0)	1905 (19150)	19.73	19.73
		1880 (18900)	19.65	19.69
		1855 (18650)	19.44	19.47
	50RB (0)	1905 (19150)	19.75	19.74
		1880 (18900)	19.66	19.72
		1855 (18650)	19.51	19.54

15MHz	1RB-High (74)	1902.5 (19125)	19.56	19.75
		1880 (18900)	19.55	19.86
		1857.5 (18675)	19.45	19.67
	1RB-Middle (37)	1902.5 (19125)	19.68	19.96
		1880 (18900)	19.69	20.04
		1857.5 (18675)	19.55	19.85
	1RB-Low (0)	1902.5 (19125)	19.54	19.81
		1880 (18900)	19.54	19.86
		1857.5 (18675)	19.39	19.65
	36RB-High (38)	1902.5 (19125)	19.74	19.72
		1880 (18900)	19.68	19.69
		1857.5 (18675)	19.55	19.60
	36RB-Middle (19)	1902.5 (19125)	20.03	19.73
		1880 (18900)	19.67	19.69
		1857.5 (18675)	19.51	19.54
	36RB-Low (0)	1902.5 (19125)	19.88	19.74
		1880 (18900)	19.64	19.68
		1857.5 (18675)	19.44	19.46
	75RB (0)	1902.5 (19125)	19.75	19.72
		1880 (18900)	19.70	19.72
		1857.5 (18675)	19.53	19.54
20MHz	1RB-High (99)	1900 (19100)	20.15	20.41
		1880 (18900)	20.13	20.27
		1860 (18700)	20.03	20.25
	1RB-Middle (50)	1900 (19100)	20.49	20.39
		1880 (18900)	20.50	20.44
		1860 (18700)	20.44	20.38
	1RB-Low (0)	1900 (19100)	20.15	20.38
		1880 (18900)	20.14	20.36
		1860 (18700)	19.97	20.16
	50RB-High (50)	1900 (19100)	20.41	20.43
		1880 (18900)	20.45	20.45
		1860 (18700)	20.26	20.23
	50RB-Middle (25)	1900 (19100)	20.43	20.44
		1880 (18900)	20.48	20.37
		1860 (18700)	20.47	20.21
	50RB-Low (0)	1900 (19100)	20.46	20.44
		1880 (18900)	20.42	20.32
		1860 (18700)	20.20	20.13
	100RB (0)	1900 (19100)	20.48	20.42
		1880 (18900)	20.45	20.36
		1860 (18700)	20.33	20.13

LTE B4-Power Level A1/B1				
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
1.4MHz	1RB-High (5)	1754.3 (20393)	22.49	21.83
		1732.5 (20175)	22.62	21.92
		1710.7 (19957)	22.50	21.75
	1RB-Middle (3)	1754.3 (20393)	22.68	22.00
		1732.5 (20175)	22.76	22.07
		1710.7 (19957)	22.66	21.99
	1RB-Low (0)	1754.3 (20393)	22.51	21.81
		1732.5 (20175)	22.63	21.91
		1710.7 (19957)	22.49	21.77
	3RB-High (3)	1754.3 (20393)	22.60	21.62
		1732.5 (20175)	22.70	21.68
		1710.7 (19957)	22.59	21.62
	3RB-Middle (1)	1754.3 (20393)	22.68	21.70
		1732.5 (20175)	22.77	21.78
		1710.7 (19957)	22.63	21.65
	3RB-Low (0)	1754.3 (20393)	22.60	21.59
		1732.5 (20175)	22.70	21.70
		1710.7 (19957)	22.56	21.56
	6RB (0)	1754.3 (20393)	21.60	20.71
		1732.5 (20175)	21.71	20.77
		1710.7 (19957)	21.54	20.61
3MHz	1RB-High (14)	1753.5 (20385)	22.56	21.79
		1732.5 (20175)	22.65	21.89
		1711.5 (19965)	22.58	21.90
	1RB-Middle (7)	1753.5 (20385)	22.72	21.92
		1732.5 (20175)	22.81	22.06
		1711.5 (19965)	22.69	21.89
	1RB-Low (0)	1753.5 (20385)	22.55	21.78
		1732.5 (20175)	22.64	21.94
		1711.5 (19965)	22.50	21.72
	8RB-High (7)	1753.5 (20385)	21.59	20.62
		1732.5 (20175)	21.66	20.73
		1711.5 (19965)	21.57	20.64
	8RB-Middle (4)	1753.5 (20385)	21.60	20.67
		1732.5 (20175)	21.69	20.74
		1711.5 (19965)	21.57	20.63
	8RB-Low (0)	1753.5 (20385)	21.58	20.65
		1732.5 (20175)	21.68	20.71
		1711.5 (19965)	21.55	20.63
	15RB (0)	1753.5 (20385)	21.58	20.57
		1732.5 (20175)	21.67	20.66
		1711.5 (19965)	21.54	20.56

5MHz	1RB-High (24)	1752.5 (20375)	22.48	21.74
		1732.5 (20175)	22.54	21.80
		1712.5 (19975)	22.48	21.71
	1RB-Middle (12)	1752.5 (20375)	22.75	22.00
		1732.5 (20175)	22.86	22.09
		1712.5 (19975)	22.77	21.93
	1RB-Low (0)	1752.5 (20375)	22.53	21.73
		1732.5 (20175)	22.59	21.80
		1712.5 (19975)	22.42	21.71
	12RB-High (13)	1752.5 (20375)	21.54	20.56
		1732.5 (20175)	21.62	20.61
		1712.5 (19975)	21.63	20.65
	12RB-Middle (6)	1752.5 (20375)	21.62	20.67
		1732.5 (20175)	21.69	20.74
		1712.5 (19975)	21.63	20.60
	12RB-Low (0)	1752.5 (20375)	21.54	20.54
		1732.5 (20175)	21.64	20.66
		1712.5 (19975)	21.54	20.57
	25RB (0)	1752.5 (20375)	21.58	20.56
		1732.5 (20175)	21.67	20.65
		1712.5 (19975)	21.61	20.59
10MHz	1RB-High (49)	1750 (20350)	22.55	21.85
		1732.5 (20175)	22.62	21.96
		1715 (20000)	22.59	21.88
	1RB-Middle (24)	1750 (20350)	22.66	22.04
		1732.5 (20175)	22.78	21.92
		1715 (20000)	22.70	21.97
	1RB-Low (0)	1750 (20350)	22.64	21.87
		1732.5 (20175)	22.68	22.00
		1715 (20000)	22.53	21.80
	25RB-High (25)	1750 (20350)	21.62	20.61
		1732.5 (20175)	21.66	20.67
		1715 (20000)	21.72	20.71
	25RB-Middle (12)	1750 (20350)	21.65	20.65
		1732.5 (20175)	21.70	20.73
		1715 (20000)	21.66	20.65
	25RB-Low (0)	1750 (20350)	21.66	20.69
		1732.5 (20175)	21.74	20.74
		1715 (20000)	21.60	20.65
	50RB (0)	1750 (20350)	21.61	20.64
		1732.5 (20175)	21.68	20.70
		1715 (20000)	21.67	20.68

15MHz	1RB-High (74)	1747.5 (20325)	22.49	21.70
		1732.5 (20175)	22.51	21.86
		1717.5 (20025)	22.52	21.85
	1RB-Middle (37)	1747.5 (20325)	22.63	21.77
		1732.5 (20175)	22.69	21.93
		1717.5 (20025)	22.60	21.88
	1RB-Low (0)	1747.5 (20325)	22.58	21.79
		1732.5 (20175)	22.64	21.79
		1717.5 (20025)	22.47	21.80
	36RB-High (38)	1747.5 (20325)	21.60	20.59
		1732.5 (20175)	21.64	20.62
		1717.5 (20025)	21.62	20.63
	36RB-Middle (19)	1747.5 (20325)	21.65	20.64
		1732.5 (20175)	21.70	20.70
		1717.5 (20025)	21.61	20.64
	36RB-Low (0)	1747.5 (20325)	21.67	20.68
		1732.5 (20175)	21.68	20.69
		1717.5 (20025)	21.60	20.61
	75RB (0)	1747.5 (20325)	21.69	20.63
		1732.5 (20175)	21.68	20.67
		1717.5 (20025)	21.65	20.62
20MHz	1RB-High (99)	1745 (20300)	22.72	22.06
		1732.5 (20175)	22.79	22.15
		1720 (20050)	22.83	22.09
	1RB-Middle (50)	1745 (20300)	23.12	22.30
		1732.5 (20175)	23.15	22.38
		1720 (20050)	23.10	22.37
	1RB-Low (0)	1745 (20300)	22.82	22.08
		1732.5 (20175)	22.78	22.05
		1720 (20050)	22.74	21.96
	50RB-High (50)	1745 (20300)	22.02	21.02
		1732.5 (20175)	22.00	21.00
		1720 (20050)	22.11	21.11
	50RB-Middle (25)	1745 (20300)	22.07	21.07
		1732.5 (20175)	22.10	21.12
		1720 (20050)	22.06	21.05
	50RB-Low (0)	1745 (20300)	22.16	21.16
		1732.5 (20175)	22.17	21.11
		1720 (20050)	22.15	20.93
	100RB (0)	1745 (20300)	22.09	21.09
		1732.5 (20175)	22.07	21.04
		1720 (20050)	22.02	21.03

LTE B4-Power Level C1				
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**
1.4MHz	1RB-High (5)	1754.3 (20393)	19.99	20.23
		1732.5 (20175)	20.07	20.42
		1710.7 (19957)	19.99	20.26
	1RB-Middle (3)	1754.3 (20393)	20.11	20.49
		1732.5 (20175)	20.20	20.49
		1710.7 (19957)	20.11	20.20
	1RB-Low (0)	1754.3 (20393)	19.99	20.31
		1732.5 (20175)	20.11	20.23
		1710.7 (19957)	20.00	20.10
	3RB-High (3)	1754.3 (20393)	20.04	20.13
		1732.5 (20175)	20.17	20.04
		1710.7 (19957)	20.05	19.86
	3RB-Middle (1)	1754.3 (20393)	20.10	20.08
		1732.5 (20175)	20.21	20.20
		1710.7 (19957)	20.14	19.86
	3RB-Low (0)	1754.3 (20393)	20.06	19.90
		1732.5 (20175)	20.13	20.09
		1710.7 (19957)	20.10	19.97
	6RB (0)	1754.3 (20393)	20.06	20.14
		1732.5 (20175)	20.15	20.12
		1710.7 (19957)	20.07	19.76
3MHz	1RB-High (14)	1753.5 (20385)	20.08	20.37
		1732.5 (20175)	20.15	20.21
		1711.5 (19965)	20.09	20.24
	1RB-Middle (7)	1753.5 (20385)	20.22	20.44
		1732.5 (20175)	20.37	20.42
		1711.5 (19965)	20.26	20.41
	1RB-Low (0)	1753.5 (20385)	20.08	20.41
		1732.5 (20175)	20.20	20.34
		1711.5 (19965)	20.10	20.03
	8RB-High (7)	1753.5 (20385)	20.13	20.19
		1732.5 (20175)	20.21	20.21
		1711.5 (19965)	20.12	19.92
	8RB-Middle (4)	1753.5 (20385)	20.16	20.07
		1732.5 (20175)	20.22	20.17
		1711.5 (19965)	20.16	19.84
	8RB-Low (0)	1753.5 (20385)	20.13	20.04
		1732.5 (20175)	20.21	20.12
		1711.5 (19965)	20.10	19.76
	15RB (0)	1753.5 (20385)	20.11	20.02
		1732.5 (20175)	20.19	20.04
		1711.5 (19965)	20.08	19.81

5MHz	1RB-High (24)	1752.5 (20375)	19.99	20.20
		1732.5 (20175)	20.06	20.32
		1712.5 (19975)	19.98	20.14
	1RB-Middle (12)	1752.5 (20375)	20.22	20.43
		1732.5 (20175)	20.38	20.42
		1712.5 (19975)	20.30	20.42
	1RB-Low (0)	1752.5 (20375)	19.98	20.10
		1732.5 (20175)	20.06	20.32
		1712.5 (19975)	20.01	20.26
	12RB-High (13)	1752.5 (20375)	20.13	20.06
		1732.5 (20175)	20.17	19.92
		1712.5 (19975)	20.10	20.11
	12RB-Middle (6)	1752.5 (20375)	20.15	19.93
		1732.5 (20175)	20.23	20.13
		1712.5 (19975)	20.12	20.10
	12RB-Low (0)	1752.5 (20375)	20.13	20.01
		1732.5 (20175)	20.17	20.15
		1712.5 (19975)	20.07	20.00
	25RB (0)	1752.5 (20375)	20.14	20.01
		1732.5 (20175)	20.19	20.11
		1712.5 (19975)	20.10	19.85
10MHz	1RB-High (49)	1750 (20350)	20.03	20.41
		1732.5 (20175)	20.06	20.05
		1715 (20000)	20.09	20.29
	1RB-Middle (24)	1750 (20350)	20.19	20.45
		1732.5 (20175)	20.20	20.17
		1715 (20000)	20.20	20.42
	1RB-Low (0)	1750 (20350)	20.08	20.38
		1732.5 (20175)	20.13	20.01
		1715 (20000)	20.08	20.10
	25RB-High (25)	1750 (20350)	20.02	19.97
		1732.5 (20175)	20.15	19.69
		1715 (20000)	20.16	19.89
	25RB-Middle (12)	1750 (20350)	20.12	19.77
		1732.5 (20175)	20.21	19.81
		1715 (20000)	20.13	19.98
	25RB-Low (0)	1750 (20350)	19.96	19.98
		1732.5 (20175)	20.18	19.81
		1715 (20000)	20.05	19.95
	50RB (0)	1750 (20350)	20.12	19.76
		1732.5 (20175)	20.13	19.70
		1715 (20000)	20.08	19.99

15MHz	1RB-High (74)	1747.5 (20325)	19.51	20.00
		1732.5 (20175)	19.53	19.91
		1717.5 (20025)	19.85	19.84
	1RB-Middle (37)	1747.5 (20325)	19.63	20.01
		1732.5 (20175)	19.67	19.90
		1717.5 (20025)	19.73	19.99
	1RB-Low (0)	1747.5 (20325)	19.58	19.80
		1732.5 (20175)	19.65	19.97
		1717.5 (20025)	19.66	19.84
	36RB-High (38)	1747.5 (20325)	19.62	19.62
		1732.5 (20175)	19.64	19.69
		1717.5 (20025)	19.84	19.68
	36RB-Middle (19)	1747.5 (20325)	19.68	19.72
		1732.5 (20175)	19.69	19.71
		1717.5 (20025)	20.08	19.68
	36RB-Low (0)	1747.5 (20325)	19.71	19.74
		1732.5 (20175)	19.69	19.70
		1717.5 (20025)	19.89	19.61
	75RB (0)	1747.5 (20325)	19.64	19.64
		1732.5 (20175)	19.72	19.67
		1717.5 (20025)	19.95	19.63
20MHz	1RB-High (99)	1745 (20300)	19.90	20.22
		1732.5 (20175)	19.97	20.17
		1720 (20050)	20.00	20.36
	1RB-Middle (50)	1745 (20300)	20.29	20.41
		1732.5 (20175)	20.33	20.43
		1720 (20050)	20.29	20.46
	1RB-Low (0)	1745 (20300)	20.01	20.30
		1732.5 (20175)	19.96	20.23
		1720 (20050)	19.94	19.87
	50RB-High (50)	1745 (20300)	20.22	20.17
		1732.5 (20175)	20.18	20.17
		1720 (20050)	20.31	20.14
	50RB-Middle (25)	1745 (20300)	20.29	20.25
		1732.5 (20175)	20.30	20.28
		1720 (20050)	20.22	20.22
	50RB-Low (0)	1745 (20300)	20.33	20.33
		1732.5 (20175)	20.34	20.24
		1720 (20050)	20.30	20.11
	100RB (0)	1745 (20300)	20.29	20.24
		1732.5 (20175)	20.25	20.21
		1720 (20050)	20.21	20.17

LTE B5-Power Level A1/B1/C1				
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
1.4MHz	1RB-High (5)	848.3 (20643)	23.31	22.71
		836.5 (20525)	23.31	22.59
		824.7 (20407)	23.37	22.62
	1RB-Middle (3)	848.3 (20643)	23.50	22.80
		836.5 (20525)	23.42	22.73
		824.7 (20407)	23.52	22.87
	1RB-Low (0)	848.3 (20643)	23.30	22.55
		836.5 (20525)	23.29	22.59
		824.7 (20407)	23.42	22.69
	3RB-High (3)	848.3 (20643)	23.47	22.48
		836.5 (20525)	23.38	22.51
		824.7 (20407)	23.43	22.53
	3RB-Middle (1)	848.3 (20643)	23.49	22.54
		836.5 (20525)	23.43	22.51
		824.7 (20407)	23.53	22.62
	3RB-Low (0)	848.3 (20643)	23.42	22.46
		836.5 (20525)	23.38	22.39
		824.7 (20407)	23.51	22.57
	6RB (0)	848.3 (20643)	22.55	21.58
		836.5 (20525)	22.46	21.51
		824.7 (20407)	22.53	21.58
3MHz	1RB-High (14)	847.5 (20635)	23.45	22.66
		836.5 (20525)	23.40	22.82
		825.5 (20415)	23.44	22.79
	1RB-Middle (7)	847.5 (20635)	23.52	22.77
		836.5 (20525)	23.51	22.92
		825.5 (20415)	23.61	22.96
	1RB-Low (0)	847.5 (20635)	23.42	22.76
		836.5 (20525)	23.39	22.75
		825.5 (20415)	23.48	22.81
	8RB-High (7)	847.5 (20635)	22.52	21.57
		836.5 (20525)	22.50	21.55
		825.5 (20415)	22.55	21.58
	8RB-Middle (4)	847.5 (20635)	22.57	21.61
		836.5 (20525)	22.56	21.60
		825.5 (20415)	22.59	21.62
	8RB-Low (0)	847.5 (20635)	22.51	21.56
		836.5 (20525)	22.49	21.53
		825.5 (20415)	22.57	21.61
	15RB (0)	847.5 (20635)	22.54	21.52
		836.5 (20525)	22.52	21.52
		825.5 (20415)	22.53	21.56

5MHz	1RB-High (24)	846.5 (20625)	23.34	22.51
		836.5 (20525)	23.28	22.71
		826.5 (20425)	23.33	22.59
	1RB-Middle (12)	846.5 (20625)	23.64	22.84
		836.5 (20525)	23.56	22.95
		826.5 (20425)	23.58	22.94
	1RB-Low (0)	846.5 (20625)	23.32	22.68
		836.5 (20525)	23.27	22.56
		826.5 (20425)	23.39	22.74
	12RB-High (13)	846.5 (20625)	22.53	21.55
		836.5 (20525)	22.44	21.45
		826.5 (20425)	22.58	21.54
	12RB-Middle (6)	846.5 (20625)	22.55	21.56
		836.5 (20525)	22.52	21.55
		826.5 (20425)	22.55	21.56
	12RB-Low (0)	846.5 (20625)	22.51	21.51
		836.5 (20525)	22.45	21.49
		826.5 (20425)	22.47	21.49
	25RB (0)	846.5 (20625)	22.53	21.51
		836.5 (20525)	22.50	21.49
		826.5 (20425)	22.52	21.52
10MHz	1RB-High (49)	844 (20600)	23.41	22.74
		836.5 (20525)	23.43	22.80
		829 (20450)	23.33	22.67
	1RB-Middle (24)	844 (20600)	23.56	22.83
		836.5 (20525)	23.49	22.86
		829 (20450)	23.55	22.86
	1RB-Low (0)	844 (20600)	23.41	22.70
		836.5 (20525)	23.41	22.66
		829 (20450)	23.48	22.75
	25RB-High (25)	844 (20600)	22.62	21.60
		836.5 (20525)	22.47	21.47
		829 (20450)	22.57	21.56
	25RB-Middle (12)	844 (20600)	22.59	21.57
		836.5 (20525)	22.53	21.49
		829 (20450)	22.57	21.54
	25RB-Low (0)	844 (20600)	22.63	21.61
		836.5 (20525)	22.54	21.53
		829 (20450)	22.58	21.49
	50RB (0)	844 (20600)	22.63	21.62
		836.5 (20525)	22.53	21.51
		829 (20450)	22.54	21.53

LTE B12-Power Level A1/B1/C1				
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
1.4MHz	1RB-High (5)	715.3 (23173)	23.19	22.50
		707.5 (23095)	23.20	22.46
		699.7 (23017)	23.25	22.49
	1RB-Middle (3)	715.3 (23173)	23.30	22.60
		707.5 (23095)	23.34	22.53
		699.7 (23017)	23.37	22.57
	1RB-Low (0)	715.3 (23173)	23.17	22.45
		707.5 (23095)	23.20	22.54
		699.7 (23017)	23.19	22.53
	3RB-High (3)	715.3 (23173)	23.25	22.32
		707.5 (23095)	23.30	22.32
		699.7 (23017)	23.31	22.28
	3RB-Middle (1)	715.3 (23173)	23.33	22.34
		707.5 (23095)	23.34	22.38
		699.7 (23017)	23.37	22.37
	3RB-Low (0)	715.3 (23173)	23.27	22.34
		707.5 (23095)	23.28	22.26
		699.7 (23017)	23.34	22.27
	6RB (0)	715.3 (23173)	22.28	21.36
		707.5 (23095)	22.27	21.35
		699.7 (23017)	22.30	21.36
3MHz	1RB-High (14)	714.5 (23165)	23.22	22.47
		707.5 (23095)	23.21	22.55
		700.5 (23025)	23.27	22.59
	1RB-Middle (7)	714.5 (23165)	23.43	22.64
		707.5 (23095)	23.42	22.58
		700.5 (23025)	23.43	22.72
	1RB-Low (0)	714.5 (23165)	23.22	22.49
		707.5 (23095)	23.28	22.58
		700.5 (23025)	23.29	22.48
	8RB-High (7)	714.5 (23165)	22.27	21.29
		707.5 (23095)	22.27	21.27
		700.5 (23025)	22.28	21.34
	8RB-Middle (4)	714.5 (23165)	22.27	21.33
		707.5 (23095)	22.28	21.32
		700.5 (23025)	22.33	21.42
	8RB-Low (0)	714.5 (23165)	22.27	21.30
		707.5 (23095)	22.27	21.33
		700.5 (23025)	22.30	21.35
	15RB (0)	714.5 (23165)	22.23	21.23
		707.5 (23095)	22.26	21.27
		700.5 (23025)	22.29	21.30

5MHz	1RB-High (24)	713.5 (23155)	23.16	22.46
		707.5 (23095)	23.17	22.37
		701.5 (23035)	23.19	22.42
	1RB-Middle (12)	713.5 (23155)	23.37	22.58
		707.5 (23095)	23.41	22.59
		701.5 (23035)	23.41	22.77
	1RB-Low (0)	713.5 (23155)	23.18	22.45
		707.5 (23095)	23.21	22.39
		701.5 (23035)	23.21	22.46
	12RB-High (13)	713.5 (23155)	22.20	21.20
		707.5 (23095)	22.31	21.31
		701.5 (23035)	22.28	21.30
	12RB-Middle (6)	713.5 (23155)	22.32	21.31
		707.5 (23095)	22.31	21.31
		701.5 (23035)	22.33	21.34
	12RB-Low (0)	713.5 (23155)	22.30	21.30
		707.5 (23095)	22.27	21.24
		701.5 (23035)	22.35	21.34
	25RB (0)	713.5 (23155)	22.28	21.25
		707.5 (23095)	22.28	21.25
		701.5 (23035)	22.35	21.30
10MHz	1RB-High (49)	711 (23130)	23.31	22.61
		707.5 (23095)	23.29	22.50
		704 (23060)	23.31	22.64
	1RB-Middle (24)	711 (23130)	23.42	22.62
		707.5 (23095)	23.44	22.60
		704 (23060)	23.41	22.75
	1RB-Low (0)	711 (23130)	23.35	22.55
		707.5 (23095)	23.32	22.51
		704 (23060)	23.26	22.45
	25RB-High (25)	711 (23130)	22.36	21.38
		707.5 (23095)	22.47	21.44
		704 (23060)	22.45	21.46
	25RB-Middle (12)	711 (23130)	22.40	21.42
		707.5 (23095)	22.39	21.43
		704 (23060)	22.39	21.43
	25RB-Low (0)	711 (23130)	22.40	21.42
		707.5 (23095)	22.32	21.36
		704 (23060)	22.41	21.43
	50RB (0)	711 (23130)	22.36	21.40
		707.5 (23095)	22.39	21.41
		704 (23060)	22.47	21.46

LTE B14-Power Level A1/B1/C1				
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM
5MHz	1RB-High (24)	795.5 (23355)	23.37	22.64
		793 (23330)	23.33	23.04
		790.5 (23305)	23.37	22.55
	1RB-Middle (12)	795.5 (23355)	23.64	22.80
		793 (23330)	23.66	23.45
		790.5 (23305)	23.59	22.89
	1RB-Low (0)	795.5 (23355)	23.35	22.59
		793 (23330)	23.36	23.15
		790.5 (23305)	23.33	22.51
	12RB-High (13)	795.5 (23355)	22.44	21.47
		793 (23330)	22.39	21.88
		790.5 (23305)	22.41	21.45
	12RB-Middle (6)	795.5 (23355)	22.49	21.50
		793 (23330)	22.51	22.02
		790.5 (23305)	22.47	21.47
	12RB-Low (0)	795.5 (23355)	22.54	22.09
		793 (23330)	22.48	21.97
		790.5 (23305)	22.32	21.34
	25RB (0)	795.5 (23355)	22.52	22.00
		793 (23330)	22.46	21.72
		790.5 (23305)	22.40	21.37
10MHz	1RB-High (49)	793 (23330)	23.47	22.80
	1RB-Middle (24)	793 (23330)	23.59	22.97
	1RB-Low (0)	793 (23330)	23.43	22.77
	25RB-High (25)	793 (23330)	22.37	21.37
	25RB-Middle (12)	793 (23330)	22.54	21.53
	25RB-Low (0)	793 (23330)	22.42	21.44
	50RB (0)	793 (23330)	22.43	21.44

11.4 Wi-Fi and BT Measurement result

The maximum output power of BT antenna is 8.01dBm.
The maximum tune up of BT antenna is 9dBm.

The average conducted power for Wi-Fi 2.4G is as following-Normal power (Receiver off):

802.11b	
Channel\data rate	5.5Mbps
11(2462MHz)	18.75
6(2437(MHz)	18.67
1(2412MHz)	18.73
Tune up	19.50
802.11g	
Channel\data rate	6Mbps
11(2462MHz)	18.25
6(2437(MHz)	18.36
1(2412MHz)	18.38
Tune up	18.50
802.11n-20MHz	
Channel\data rate	MCS0
11(2462MHz)	18.22
6(2437(MHz)	18.39
1(2412MHz)	18.11
Tune up	18.50
802.11n-40MHz	
Channel\data rate	MCS0
9(2452MHz)	17.45
6(2437MHz)	17.31
3(2422MHz)	17.22
Tune up	18.00

The average conducted power for Wi-Fi 2.4G is as following-Low power (Wifi only, Receiver on):

802.11b	
Channel\data rate	5.5Mbps
11(2462MHz)	17.16
6(2437(MHz)	17.15
1(2412MHz)	16.81
Tune up	18.00
802.11g	
Channel\data rate	6Mbps
11(2462MHz)	16.87
6(2437(MHz)	16.84
1(2412MHz)	16.52
Tune up	17.00
802.11n-20MHz	
Channel\data rate	MCS0
11(2462MHz)	16.92
6(2437(MHz)	16.98
1(2412MHz)	16.75
Tune up	17.00
802.11n-40MHz	
Channel\data rate	MCS0
9(2452MHz)	17.45
6(2437MHz)	17.31
3(2422MHz)	17.22
Tune up	18.00

The average conducted power for Wi-Fi 2.4G is as following-Low power (WIFI+ Cellular, Receiver on):

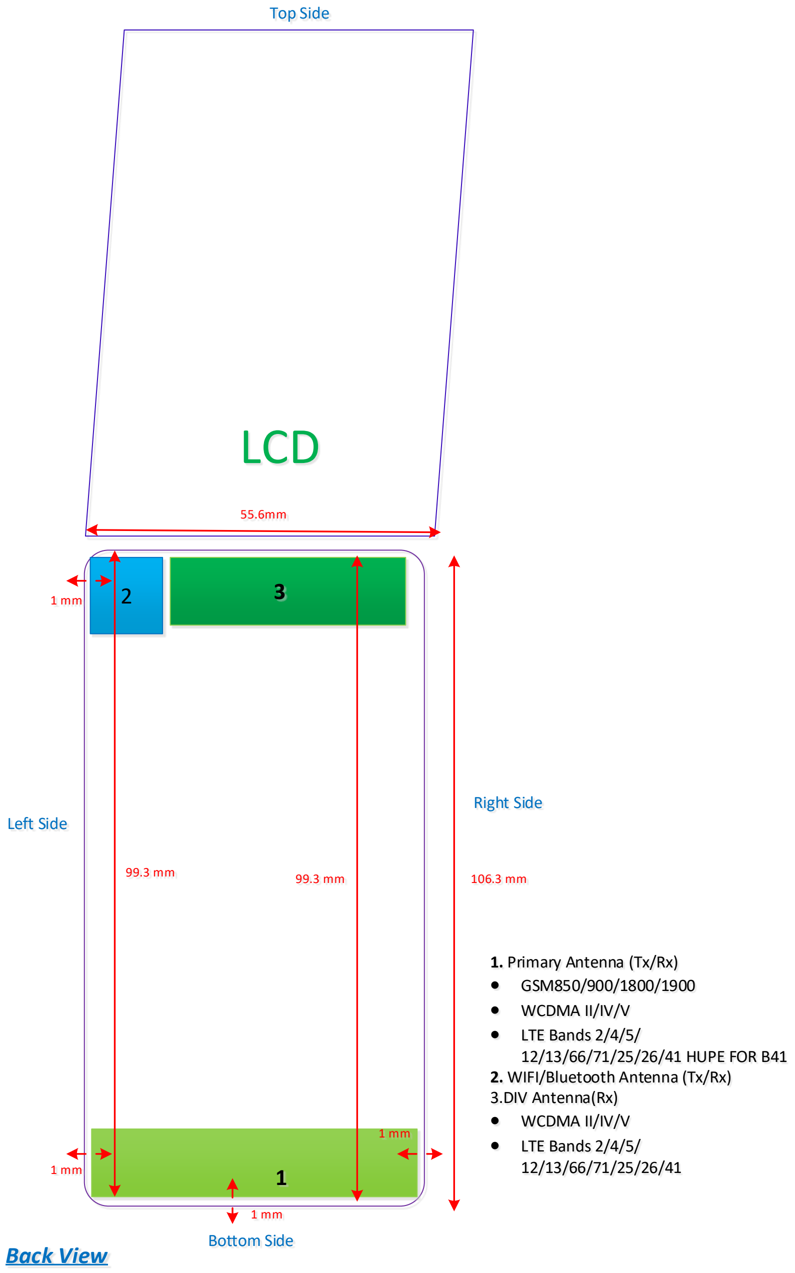
802.11b	
Channel\data rate	5.5Mbps
11(2462MHz)	14.66
6(2437(MHz)	14.65
1(2412MHz)	14.15
Tune up	15.00
802.11g	
Channel\data rate	6Mbps
11(2462MHz)	14.47
6(2437(MHz)	14.71
1(2412MHz)	14.66
Tune up	15.00
802.11n-20MHz	
Channel\data rate	MCS0
11(2462MHz)	14.50
6(2437(MHz)	14.81
1(2412MHz)	14.31
Tune up	15.00
802.11n-40MHz	
Channel\data rate	MCS0
9(2452MHz)	13.47
6(2437MHz)	13.77
3(2422MHz)	13.61
Tune up	14.00

12 Simultaneous TX SAR Considerations

12.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the BT and Wi-Fi can transmit simultaneous with other transmitters.

12.2 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	Right	Top	Bottom
MAIN ANT	Yes	Yes	Yes	Yes	No	Yes
WiFi ANT	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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Table 12.1: Standalone SAR test exclusion considerations

Band/Mode	**F(GHz)**	**Position**	**SAR test exclusion threshold(mW)**	**RF output power**		**SAR test exclusion**
				dBm	**mW**	
Bluetooth	2.441	Head	9.60	9	7.94	Yes
		Body	19.20	9	7.94	Yes
2.4GHz WLAN	2.45	Head	9.58	18	63.1	No
		Body	19.17	19.5	89.13	No

13 Evaluation of Simultaneous

Table 13.1: The sum of SAR values for Main antenna + WiFi-2.4G (1g)

	Position	Main antenna	WiFi-2.4G	Sum
Highest SAR value for Head	Right head, Cheek (GSM850)	1.12	0.28	**1.40**
Highest SAR value for Body	Rear 10mm (GSM850)	1.27	0.19	**1.46**
	Rear 10mm (GSM1900)	1.27	0.19	**1.46**

Table 13.2: The sum of SAR values for main antenna and BT (1g)

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Right head, Cheek (GSM850)	1.12	0.33[1]	**1.45**
Maximum reported SAR value for Body	Rear 10mm (GSM850)	1.27	0.17[1]	**1.44**
	Rear 10mm (GSM1900)	1.27	0.17[1]	**1.44**

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

Table 13.3: Estimated SAR for Bluetooth

Mode/Band	**F (GHz)**	**Position**	**Distance (mm)**	**Upper limit of power ***		**Estimated SAR_{1g} (W/kg)**
				dBm	**mW**	
Bluetooth	2.441	Head	5	9	7.94	0.33
Bluetooth	2.441	Body	10	9	7.94	0.17

* - Maximum possible output power declared by manufacturer

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

Conclusion:

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

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 10/15 mm and just applied to the condition of body worn accessory.

It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-g SAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.

The calculated SAR is obtained by the following formula:

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

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

Table 14.1: Duty Cycle

Mode	Duty Cycle
GPRS&EGPRS for GSM 850/1900	1:2 or 1:4
WCDMA&LTE FDD	1:1

Note:
H1: The verification results for Headset.

14.1 SAR results for 2G/3G/4G

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
251	848.8	Left	Cheek	/	27.78	28.00	0.463	**0.49**	0.744	**0.78**	-0.09
190	836.6	Left	Cheek	/	27.79	28.00	0.523	**0.55**	0.877	**0.92**	0.02
128	824.2	Left	Cheek	/	27.76	28.00	0.526	**0.56**	0.887	**0.94**	0.1
190	836.6	Left	Tilt	/	27.79	28.00	0.323	**0.34**	0.483	**0.51**	-0.05
251	848.8	Right	Cheek	/	27.78	28.00	0.542	**0.57**	0.914	**0.96**	-0.1
190	836.6	Right	Cheek	/	27.79	28.00	0.568	**0.60**	0.979	**1.03**	0.09
128	824.2	Right	Cheek	Fig.1	27.76	28.00	0.621	**0.66**	1.060	**1.12**	0.12
190	836.6	Right	Tilt	/	27.79	28.00	0.403	**0.42**	0.597	**0.63**	0.14

Note: The head SAR of GSM850 is tested with GPRS (4Txslots) mode because of VoIP.

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	GPRS (4)	Front	/	27.79	28.00	0.281	**0.29**	0.356	**0.37**	0.02
251	848.8	GPRS (4)	Rear	/	27.78	28.00	0.736	**0.77**	1.090	**1.15**	0.05
190	836.6	GPRS (4)	Rear	/	27.79	28.00	0.822	**0.86**	1.160	**1.22**	-0.07
128	824.2	GPRS (4)	Rear	Fig.2	27.76	28.00	0.855	**0.90**	1.200	**1.27**	-0.09
190	836.6	GPRS (4)	Rear	Unfold	27.79	28.00	0.525	**0.55**	0.689	**0.72**	-0.01
190	836.6	GPRS (4)	Left	/	27.79	28.00	0.261	**0.27**	0.354	**0.37**	-0.03
190	836.6	GPRS (4)	Right	/	27.79	28.00	0.435	**0.46**	0.611	**0.64**	0.09
190	836.6	GPRS (4)	Bottom	/	27.79	28.00	0.063	**0.07**	0.092	**0.10**	-0.15
128	824.2	EGPRS (4)	Rear	/	27.75	28.00	0.807	**0.85**	1.120	**1.19**	0.12
128	824.2	GPRS (4)	Rear	H1	27.76	28.00	0.832	**0.88**	1.150	**1.22**	0.12

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

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
810	1909.8	Left	Cheek	/	27.41	27.80	0.127	**0.14**	0.196	**0.21**	0.08
661	1880	Left	Cheek	/	27.35	27.80	0.125	**0.14**	0.203	**0.23**	0.12
512	1850.2	Left	Cheek	Fig.3	27.38	27.80	0.138	**0.15**	0.215	**0.24**	-0.11
661	1880	Left	Tilt	/	27.35	27.80	0.038	**0.04**	0.052	**0.06**	-0.01
661	1880	Right	Cheek	/	27.35	27.80	0.076	**0.08**	0.129	**0.14**	-0.06
661	1880	Right	Tilt	/	27.35	27.80	0.030	**0.03**	0.041	**0.05**	-0.04

Note: The head SAR of GSM1900 is tested with GPRS (2Txslots) mode because of VoIP.

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
661	1880	GPRS (2)	Front	/	27.35	27.80	0.168	**0.19**	0.285	**0.32**	0.01
810	1909.8	GPRS (2)	Rear	/	27.41	27.80	0.497	**0.54**	0.836	**0.91**	0.13
661	1880	GPRS (2)	Rear	/	27.35	27.80	0.519	**0.58**	0.933	**1.03**	0.17
512	1850.2	GPRS (2)	Rear	Fig.4	27.38	27.80	0.655	**0.72**	1.150	**1.27**	0.12
810	1909.8	GPRS (2)	Rear	Unfold	27.41	27.80	0.454	**0.50**	0.783	**0.86**	0.15
661	1880	GPRS (2)	Rear	Unfold	27.35	27.80	0.483	**0.54**	0.869	**0.96**	0.16
512	1850.2	GPRS (2)	Rear	Unfold	27.38	27.80	0.623	**0.69**	1.100	**1.21**	-0.09
661	1880	GPRS (2)	Left	/	27.35	27.80	0.240	**0.27**	0.403	**0.45**	-0.02
661	1880	GPRS (2)	Right	/	27.35	27.80	0.123	**0.14**	0.247	**0.27**	-0.11
661	1880	GPRS (2)	Bottom	/	27.35	27.80	0.140	**0.16**	0.228	**0.25**	0.16
512	1850.2	EGPRS (2)	Rear	/	27.35	28.00	0.611	**0.71**	1.080	**1.25**	-0.08
512	1850.2	GPRS (2)	Rear	H1	27.38	27.80	0.632	**0.70**	1.120	**1.23**	-0.09

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

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°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)
Ch.	MHz										
9538	1907.6	Left	Cheek	Fig.5	22.98	23.50	0.220	**0.25**	0.350	**0.39**	-0.09
9400	1880	Left	Cheek	/	22.97	23.50	0.201	**0.23**	0.334	**0.38**	0.07
9262	1852.4	Left	Cheek	/	22.95	23.50	0.204	**0.23**	0.321	**0.36**	-0.14
9400	1880	Left	Tilt	/	22.97	23.50	0.084	**0.09**	0.110	**0.12**	0.01
9400	1880	Right	Cheek	/	22.97	23.50	0.166	**0.19**	0.265	**0.30**	-0.12
9400	1880	Right	Tilt	/	22.97	23.50	0.063	**0.07**	0.082	**0.09**	0.1

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9400	1880	Front	/	22.97	23.50	0.210	**0.24**	0.334	**0.38**	0.15
9538	1907.6	Rear	/	22.98	23.50	0.486	**0.55**	0.822	**0.93**	-0.16
9400	1880	Rear	/	22.97	23.50	0.486	**0.55**	0.818	**0.92**	0.14
9262	1852.4	Rear	Fig.6	22.95	23.50	0.597	**0.68**	1.020	**1.16**	-0.05
9538	1907.6	Rear	Unfold	22.98	23.50	0.455	**0.51**	0.763	**0.86**	-0.05
9400	1880	Rear	Unfold	22.97	23.50	0.464	**0.52**	0.770	**0.87**	-0.14
9262	1852.4	Rear	Unfold	22.95	23.50	0.573	**0.65**	0.874	**0.99**	0.12

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

Table 14.1-7: SAR Values (WCDMA 1900 MHz Band – Hotspot)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9400	1880	Front	/	20.32	21.00	0.143	**0.17**	0.237	**0.28**	-0.08
9538	1907.6	Rear	/	20.40	21.00	0.432	**0.50**	0.757	**0.87**	0.11
9400	1880	Rear	Fig.7	20.32	21.00	0.483	**0.56**	0.848	**0.99**	-0.07
9262	1852.4	Rear	/	20.16	21.00	0.433	**0.53**	0.769	**0.93**	0.06
9538	1907.6	Rear	Unfold	20.40	21.00	0.412	**0.47**	0.728	**0.84**	-0.08
9400	1880	Rear	Unfold	20.32	21.00	0.460	**0.54**	0.815	**0.95**	0.14
9262	1852.4	Rear	Unfold	20.16	21.00	0.413	**0.50**	0.739	**0.90**	0.07
9400	1880	Left	/	20.32	21.00	0.197	**0.23**	0.334	**0.39**	-0.04
9400	1880	Right	/	20.32	21.00	0.110	**0.13**	0.219	**0.26**	-0.05
9400	1880	Bottom	/	20.32	21.00	0.108	**0.13**	0.174	**0.20**	0.09

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

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

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°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)
Ch.	MHz										
1513	1752.6	Left	Cheek	Fig.8	22.79	23.50	0.220	**0.26**	0.326	**0.38**	0.04
1412	1732.4	Left	Cheek	/	22.82	23.50	0.177	**0.21**	0.281	**0.33**	-0.06
1312	1712.4	Left	Cheek	/	22.92	23.50	0.218	**0.25**	0.319	**0.36**	0.17
1412	1732.4	Left	Tilt	/	22.82	23.50	0.061	**0.07**	0.075	**0.09**	0.05
1412	1732.4	Right	Cheek	/	22.82	23.50	0.111	**0.13**	0.141	**0.16**	0.16
1412	1732.4	Right	Tilt	/	22.82	23.50	0.055	**0.06**	0.064	**0.07**	-0.03

Table 14.1-9: SAR Values (WCDMA 1700 MHz Band – Body Worn)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1412	1732.4	Front	/	22.82	23.50	0.253	**0.30**	0.409	**0.48**	-0.08
1513	1752.6	Rear	Fig.9	22.83	23.50	0.612	**0.71**	1.060	**1.24**	0.12
1412	1732.4	Rear	/	22.82	23.50	0.610	**0.71**	1.050	**1.23**	-0.07
1312	1712.4	Rear	/	22.92	23.50	0.603	**0.69**	1.030	**1.18**	0.07
1513	1752.6	Rear	Unfold	22.83	23.50	0.574	**0.67**	0.917	**1.07**	-0.09
1412	1732.4	Rear	Unfold	22.82	23.50	0.572	**0.67**	0.908	**1.06**	0.13
1312	1712.4	Rear	Unfold	22.92	23.50	0.565	**0.65**	0.891	**1.02**	0.11
1513	1752.6	Rear	Headset	22.83	23.50	0.589	**0.69**	1.040	**1.21**	-0.09

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

Table 14.1-10: SAR Values (WCDMA 1700 MHz Band – Hotspot)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1412	1732.4	Front	/	20.08	20.50	0.146	**0.16**	0.233	**0.26**	-0.01
1513	1752.6	Rear	/	20.05	20.50	0.556	**0.62**	1.04	**1.15**	-0.05
1412	1732.4	Rear	Fig.10	20.08	20.50	0.576	**0.63**	1.07	**1.18**	0.12
1312	1712.4	Rear	/	20.10	20.50	0.564	**0.62**	1.02	**1.12**	-0.05
1513	1752.6	Rear	Unfold	20.05	20.50	0.471	**0.52**	0.807	**0.90**	-0.08
1412	1732.4	Rear	Unfold	20.08	20.50	0.488	**0.54**	0.83	**0.91**	-0.15
1312	1712.4	Rear	Unfold	20.10	20.50	0.478	**0.52**	0.791	**0.87**	-0.12
1412	1732.4	Left	/	20.08	20.50	0.156	**0.17**	0.267	**0.29**	0.01
1412	1732.4	Right	/	20.08	20.50	0.063	**0.07**	0.103	**0.11**	0.06
1412	1732.4	Bottom	/	20.08	20.50	0.199	**0.22**	0.346	**0.38**	-0.15
1412	1732.4	Rear	H1	20.08	20.50	0.562	**0.62**	1.05	**1.16**	-0.09

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

Table 14.1-11: SAR Values (WCDMA 850 MHz Band - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°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)
Ch.	MHz										
4183	836.6	Left	Cheek	/	23.29	23.50	0.292	**0.31**	0.465	**0.49**	0.15
4183	836.6	Left	Tilt	/	23.29	23.50	0.178	**0.19**	0.258	**0.27**	0.14
4233	846.6	Right	Cheek	Fig.11	23.26	23.50	0.339	**0.36**	0.584	**0.62**	-0.04
4183	836.6	Right	Cheek	/	23.29	23.50	0.336	**0.35**	0.555	**0.58**	0.01
4132	826.4	Right	Cheek	/	23.16	23.50	0.319	**0.34**	0.553	**0.60**	0.14
4183	836.6	Right	Tilt	/	23.29	23.50	0.209	**0.22**	0.307	**0.32**	-0.05

Table 14.1-12: SAR Values (WCDMA 850 MHz Band - Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
4183	836.6	Front	/	23.29	23.50	0.233	**0.24**	0.299	**0.31**	0.13
4233	846.6	Rear	Fig.12	23.26	23.50	0.658	**0.70**	0.912	**0.96**	0.02
4183	836.6	Rear	/	23.29	23.50	0.632	**0.66**	0.856	**0.90**	0.05
4132	826.4	Rear	/	23.16	23.50	0.636	**0.69**	0.862	**0.93**	-0.12
4183	836.6	Rear	Unfold	23.29	23.50	0.326	**0.34**	0.435	**0.46**	0.17
4183	836.6	Left	/	23.29	23.50	0.221	**0.23**	0.303	**0.32**	0.08
4183	836.6	Right	/	23.29	23.50	0.353	**0.37**	0.489	**0.51**	0.16
4183	836.6	Bottom	/	23.29	23.50	0.054	**0.06**	0.079	**0.08**	0.15

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

Table 14.1-13: SAR Values (LTE Band2 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C												
Frequency		Mode	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)
Ch.	MHz											
18900	1880	1RB_Mid	Left	Cheek	Fig.13	23.15	23.50	0.171	**0.19**	0.281	**0.30**	-0.07
18900	1880	1RB_Mid	Left	Tilt	/	23.15	23.50	0.056	**0.06**	0.083	**0.09**	-0.18
18900	1880	1RB_Mid	Right	Cheek	/	23.15	23.50	0.099	**0.11**	0.183	**0.20**	0.13
18900	1880	1RB_Mid	Right	Tilt	/	23.15	23.50	0.044	**0.05**	0.063	**0.07**	-0.17
18900	1880	50RB-Mid	Left	Cheek	/	22.14	22.50	0.139	**0.15**	0.222	**0.24**	-0.1
18900	1880	50RB-Mid	Left	Tilt	/	22.14	22.50	0.043	**0.05**	0.063	**0.07**	0.1
18900	1880	50RB-Mid	Right	Cheek	/	22.14	22.50	0.070	**0.08**	0.127	**0.14**	0.14
18900	1880	50RB-Mid	Right	Tilt	/	22.14	22.50	0.035	**0.04**	0.051	**0.06**	0.15

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-14: SAR Values (LTE Band2 – Body worn)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
18900	1880	1RB-Mid Front	/	23.15	23.50	0.159	**0.17**	0.262	**0.28**	-0.07
19100	1900	1RB-Mid Rear	/	23.14	23.50	0.413	**0.45**	0.725	**0.79**	0.02
18900	1880	1RB-Mid Rear	Fig.14	23.15	23.50	0.453	**0.49**	0.773	**0.84**	0.19
18700	1860	1RB-Mid Rear	/	23.10	23.50	0.445	**0.49**	0.746	**0.82**	-0.06
18900	1880	100RB Rear	/	22.07	22.50	0.378	**0.42**	0.671	**0.74**	0.05
18900	1880	1RB-Mid Rear	Unfold	23.15	23.50	0.418	**0.45**	0.721	**0.78**	0.05
18900	1880	50RB-Mid Front	/	22.14	22.50	0.125	**0.14**	0.205	**0.22**	-0.03
18900	1880	50RB-Mid Rear	/	22.14	22.50	0.327	**0.36**	0.568	**0.62**	0.12
18900	1880	50RB-Mid Rear	Unfold	22.14	22.50	0.320	**0.35**	0.551	**0.60**	0.14

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

Note2: The LTE mode is QPSK_20MHz.

Table 14.1-15: SAR Values (LTE Band2 – Hotspot)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
18900	1880	1RB-Mid Front	/	20.50	20.50	0.150	**0.15**	0.236	**0.24**	-0.06
19100	1900	1RB-Mid Rear	/	20.49	20.50	0.421	**0.42**	0.712	**0.71**	0.18
18900	1880	1RB-Mid Rear	/	20.50	20.50	0.477	**0.48**	0.833	**0.83**	-0.03
18700	1860	1RB-Mid Rear	Fig.15	20.44	20.50	0.498	**0.50**	0.866	**0.88**	0.19
18700	1860	100RB Rear	/	20.33	20.50	0.472	**0.49**	0.828	**0.86**	0.05
18900	1880	1RB-Mid Rear	Unfold	20.50	20.50	0.420	**0.42**	0.695	**0.70**	0.14
18900	1880	1RB-Mid Left	/	20.50	20.50	0.199	**0.20**	0.323	**0.32**	-0.08
18900	1880	1RB-Mid Right	/	20.50	20.50	0.118	**0.12**	0.222	**0.22**	0.05
18900	1880	1RB-Mid Bottom	/	20.50	20.50	0.106	**0.11**	0.166	**0.17**	0.14
18900	1880	50RB-Mid Front	/	20.48	20.50	0.064	**0.06**	0.100	**0.10**	-0.07
18900	1880	50RB-Mid Rear	/	20.48	20.50	0.452	**0.45**	0.769	**0.77**	-0.17
18900	1880	50RB-Mid Rear	Unfold	20.48	20.50	0.407	**0.41**	0.676	**0.68**	-0.02
18900	1880	50RB-Mid Left	/	20.48	20.50	0.061	**0.06**	0.097	**0.10**	-0.07
18900	1880	50RB-Mid Right	/	20.48	20.50	0.131	**0.13**	0.244	**0.25**	0.1
18900	1880	50RB-Mid Bottom	/	20.48	20.50	0.067	**0.07**	0.114	**0.11**	-0.07

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

Note2: The LTE mode is QPSK_20MHz.

Table 14.1-16: SAR Values (LTE Band4 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C												
Frequency		Mode	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)
Ch.	MHz											
20175	1732.5	1RB_Mid	Left	Cheek	Fig.16	23.15	23.50	0.199	**0.22**	0.308	**0.33**	0.05
20175	1732.5	1RB_Mid	Left	Tilt	/	23.15	23.50	0.055	**0.06**	0.078	**0.08**	-0.15
20175	1732.5	1RB_Mid	Right	Cheek	/	23.15	23.50	0.097	**0.11**	0.138	**0.15**	0.17
20175	1732.5	1RB_Mid	Right	Tilt	/	23.15	23.50	0.052	**0.06**	0.067	**0.07**	-0.04
20175	1732.5	50RB-Low	Left	Cheek	/	22.17	22.50	0.157	**0.17**	0.254	**0.27**	-0.06
20175	1732.5	50RB-Low	Left	Tilt	/	22.17	22.50	0.047	**0.05**	0.066	**0.07**	-0.14
20175	1732.5	50RB-Low	Right	Cheek	/	22.17	22.50	0.085	**0.09**	0.137	**0.15**	0.15
20175	1732.5	50RB-Low	Right	Tilt	/	22.17	22.50	0.044	**0.05**	0.061	**0.07**	-0.11

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-17: SAR Values (LTE Band4 – Body worn)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
20175	1732.5	1RB-Mid Front	/	23.15	23.50	0.179	**0.19**	0.280	**0.30**	0.06
20300	1745	1RB-Mid Rear	Fig.17	23.12	23.50	0.557	**0.61**	0.959	**1.05**	0.12
20175	1732.5	1RB-Mid Rear		23.15	23.50	0.527	**0.57**	0.912	**0.99**	0.05
20050	1720	1RB-Mid Rear	/	23.10	23.50	0.464	**0.51**	0.790	**0.87**	-0.11
20300	1745	100RB Rear	/	22.09	23.50	0.425	**0.59**	0.730	**1.01**	0.09
20175	1732.5	1RB-Mid Rear	Unfold	23.15	23.50	0.350	**0.38**	0.539	**0.58**	0.12
20175	1732.5	50RB-Low Front	/	22.17	22.50	0.134	**0.14**	0.211	**0.23**	-0.06
20175	1732.5	50RB-Low Rear	/	22.17	22.50	0.363	**0.39**	0.613	**0.66**	0.09
20175	1732.5	50RB-Low Rear	Unfold	22.17	22.50	0.325	**0.35**	0.520	**0.56**	0.08

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

Note2: The LTE mode is QPSK_20MHz.

Table 14.1-18: SAR Values (LTE Band4 – Hotspot)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
20175	1732.5	1RB-Mid Front	/	20.33	20.50	0.131	**0.14**	0.214	**0.22**	0.12
20050	1720	1RB-Mid Rear	/	20.29	20.50	0.494	**0.52**	0.899	**0.94**	0.07
20175	1732.5	1RB-Mid Rear	Fig.18	20.33	20.50	0.529	**0.55**	0.968	**1.01**	0.02
20300	1745	1RB-Mid Rear	/	20.29	20.50	0.460	**0.48**	0.841	**0.88**	-0.01
20175	1732.5	100RB Rear	/	20.25	20.50	0.499	**0.53**	0.908	**0.96**	-0.13
20175	1732.5	1RB-Mid Rear	Unfold	20.33	20.50	0.370	**0.38**	0.653	**0.68**	0.06
20175	1732.5	1RB-Mid Left	/	20.33	20.50	0.123	**0.13**	0.211	**0.22**	-0.09
20175	1732.5	1RB-Mid Right	/	20.33	20.50	0.052	**0.05**	0.085	**0.09**	-0.15
20175	1732.5	1RB-Mid Bottom	/	20.33	20.50	0.149	**0.15**	0.275	**0.29**	0.07
20175	1732.5	50RB-Low Front	/	20.34	20.50	0.109	**0.11**	0.179	**0.19**	0.11
20050	1720	50RB-Low Rear	/	20.30	20.50	0.429	**0.45**	0.784	**0.82**	0.07
20175	1732.5	50RB-Low Rear	/	20.34	20.50	0.443	**0.46**	0.808	**0.84**	-0.09
20300	1745	50RB-Low Rear	/	20.33	20.50	0.438	**0.46**	0.803	**0.84**	-0.04
20175	1732.5	50RB-Low Rear	Unfold	20.34	20.50	0.374	**0.39**	0.643	**0.67**	-0.16
20175	1732.5	50RB-Low Left	/	20.34	20.50	0.115	**0.12**	0.196	**0.20**	-0.05
20175	1732.5	50RB-Low Right	/	20.34	20.50	0.048	**0.05**	0.081	**0.08**	0.18
20175	1732.5	50RB-Low Bottom	/	20.34	20.50	0.146	**0.15**	0.273	**0.28**	0.08

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

Note2: The LTE mode is QPSK_20MHz.

Table 14.1-19: SAR Values (LTE Band5 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C												
Frequency		Mode	Side	Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
20600	844	1RB_Mid	Left	Cheek	/	23.56	24.00	0.281	**0.31**	0.456	**0.50**	-0.12
20600	844	1RB_Mid	Left	Tilt	/	23.56	24.00	0.172	**0.19**	0.253	**0.28**	0.09
20600	844	1RB_Mid	Right	Cheek	Fig.19	23.56	24.00	0.357	**0.40**	0.582	**0.64**	0.02
20600	844	1RB_Mid	Right	Tilt	/	23.56	24.00	0.219	**0.24**	0.325	**0.36**	0.01
20600	844	25RB_Low	Left	Cheek	/	22.63	24.00	0.237	**0.32**	0.385	**0.53**	0.16
20600	844	25RB_Low	Left	Tilt	/	22.63	24.00	0.145	**0.20**	0.210	**0.29**	-0.01
20600	844	25RB_Low	Right	Cheek	/	22.63	24.00	0.258	**0.35**	0.426	**0.58**	0.1
20600	844	25RB_Low	Right	Tilt	/	22.63	24.00	0.166	**0.23**	0.245	**0.34**	0.18

Note: The LTE mode is QPSK_10MHz.

Table 14.1-20: SAR Values (LTE Band5 –Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
20600	844	1RB-Mid Front	/	23.56	24.00	0.231	**0.26**	0.303	**0.34**	0.16
20450	829	1RB-Mid Rear	/	23.55	24.00	0.654	**0.73**	0.890	**0.99**	0.17
20525	836.5	1RB-Mid Rear	/	23.49	24.00	0.666	**0.75**	0.907	**1.02**	0.18
20600	844	1RB-Mid Rear	Fig.20	23.56	24.00	0.701	**0.78**	0.966	**1.07**	0.01
20600	844	50RB Rear	/	22.63	23.00	0.575	**0.63**	0.789	**0.86**	0.15
20600	844	1RB-Mid Rear	Unfold	23.56	24.00	0.296	**0.33**	0.400	**0.44**	0.06
20600	844	1RB-Mid Left	/	23.56	24.00	0.255	**0.28**	0.356	**0.39**	0.08
20600	844	1RB-Mid Right	/	23.56	24.00	0.417	**0.46**	0.594	**0.66**	0.15
20600	844	1RB-Mid Bottom	/	23.56	24.00	0.051	**0.06**	0.079	**0.09**	0.1
20600	844	25RB-Low Front	/	22.63	23.00	0.180	**0.20**	0.238	**0.26**	-0.1
20450	829	25RB-Low Rear		22.58	23.00	0.517	**0.57**	0.703	**0.77**	0.04
20525	836.5	25RB-Low Rear		22.54	23.00	0.505	**0.56**	0.690	**0.77**	-0.17
20600	844	25RB-Low Rear	/	22.63	23.00	0.561	**0.61**	0.773	**0.84**	0.03
20600	844	25RB-Low Rear	Unfold	22.63	23.00	0.233	**0.25**	0.317	**0.35**	0.03
20600	844	25RB-Low Left	/	22.63	23.00	0.200	**0.22**	0.280	**0.30**	0.12
20600	844	25RB-Low Right	/	22.63	23.00	0.336	**0.37**	0.472	**0.51**	0.08
20600	844	25RB-Low Bottom	/	22.63	23.00	0.042	**0.05**	0.065	**0.07**	-0.09

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

Note2: The LTE mode is QPSK_10MHz.

Table 14.1-21: SAR Values (LTE Band12 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C												
Frequency		Mode	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)
Ch.	MHz											
23095	707.5	1RB-Mid	Left	Cheek	/	23.44	24.50	0.166	**0.21**	0.302	**0.39**	-0.16
23095	707.5	1RB-Mid	Left	Tilt	/	23.44	24.50	0.083	**0.11**	0.114	**0.15**	-0.03
23095	707.5	1RB-Mid	Right	Cheek	Fig.21	23.44	24.50	0.217	**0.28**	0.354	**0.45**	0.04
23095	707.5	1RB-Mid	Right	Tilt	/	23.44	24.50	0.089	**0.11**	0.123	**0.16**	-0.15
23095	707.5	25RB-High	Left	Cheek	/	22.47	23.50	0.131	**0.17**	0.236	**0.30**	0.15
23095	707.5	25RB-High	Left	Tilt	/	22.47	23.50	0.065	**0.08**	0.088	**0.11**	0.06
23095	707.5	25RB-High	Right	Cheek	/	22.47	23.50	0.172	**0.22**	0.269	**0.34**	-0.1
23095	707.5	25RB-High	Right	Tilt	/	22.47	23.50	0.071	**0.09**	0.098	**0.12**	-0.13

Note1: The LTE mode is QPSK_10MHz.

Table 14.1-22: SAR Values (LTE Band12 - Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
23095	707.5	1RB-Mid Front	/	23.44	24.50	0.100	**0.13**	0.135	**0.17**	-0.02
23095	707.5	1RB-Mid Rear	Fig.22	23.44	24.50	0.443	**0.57**	0.618	0.79	0.05
23095	707.5	1RB-Mid Rear	Unfold	23.44	24.50	0.393	**0.50**	0.540	**0.69**	0.11
23095	707.5	1RB-Mid Left	/	23.44	24.50	0.157	**0.20**	0.224	**0.29**	-0.02
23095	707.5	1RB-Mid Right	/	23.44	24.50	0.128	**0.16**	0.184	**0.23**	0.06
23095	707.5	1RB-Mid Bottom	/	23.44	24.50	0.039	**0.05**	0.065	**0.08**	0.02
23095	707.5	25RB-High Front	/	22.47	23.50	0.078	**0.10**	0.107	**0.14**	0.14
23095	707.5	25RB-High Rear	/	22.47	23.50	0.355	**0.45**	0.506	**0.64**	-0.06
23095	707.5	25RB-High Rear	Unfold	22.47	23.50	0.297	**0.38**	0.410	**0.52**	-0.01
23095	707.5	25RB-High Left	/	22.47	23.50	0.100	**0.13**	0.144	**0.18**	-0.04
23095	707.5	25RB-High Right	/	22.47	23.50	0.125	**0.16**	0.181	**0.23**	0.11
23095	707.5	25RB-High Bottom	/	22.47	23.50	0.028	**0.04**	0.047	**0.06**	-0.16

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

Note2: The LTE mode is QPSK_10MHz.

Table 14.1-23: SAR Values (LTE Band14 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C												
Frequency		Mode	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)
Ch.	MHz											
23330	793	1RB-Mid	Left	Cheek	/	23.59	24.50	0.300	**0.37**	0.501	**0.62**	0.08
23330	793	1RB-Mid	Left	Tilt	/	23.59	24.50	0.164	**0.20**	0.224	**0.28**	0.16
23330	793	1RB-Mid	Right	Cheek	Fig.23	23.59	24.50	0.337	**0.42**	0.548	0.68	-0.09
23330	793	1RB-Mid	Right	Tilt	/	23.59	24.50	0.190	**0.23**	0.269	**0.33**	0.17
23330	793	25RB-Mid	Left	Cheek	/	22.54	23.50	0.231	**0.29**	0.377	**0.47**	-0.07
23330	793	25RB-Mid	Left	Tilt	/	22.54	23.50	0.120	**0.15**	0.275	**0.34**	-0.11
23330	793	25RB-Mid	Right	Cheek	/	22.54	23.50	0.268	**0.33**	0.435	**0.54**	-0.06
23330	793	25RB-Mid	Right	Tilt	/	22.54	23.50	0.151	**0.19**	0.213	**0.27**	0.12

Note1: The LTE mode is QPSK_10MHz.

Table 14.1-24: SAR Values (LTE Band14 - Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Mode	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
23330	793	1RB-Mid Front	/	23.59	24.50	0.224	**0.28**	0.292	**0.36**	-0.07
23330	793	1RB-Mid Rear	Fig.24	23.59	24.50	0.644	**0.79**	0.898	**1.11**	-0.01
23330	793	1RB-Mid Rear	Unfold	23.59	24.50	0.353	**0.44**	0.491	**0.61**	-0.14
23330	793	1RB-Mid Left	/	23.59	24.50	0.227	**0.28**	0.306	**0.38**	0.13
23330	793	1RB-Mid Right	/	23.59	24.50	0.399	**0.49**	0.562	**0.69**	0.16
23330	793	1RB-Mid Bottom	/	23.59	24.50	0.046	**0.06**	0.065	**0.08**	-0.1
23330	793	25RB-Mid Front	/	22.54	23.50	0.178	**0.22**	0.233	**0.29**	0.05
23330	793	25RB-Mid Rear	/	22.54	23.50	0.520	**0.65**	0.726	**0.91**	-0.14
23330	793	50RB Rear	/	22.43	23.50	0.511	**0.65**	0.703	**0.90**	-0.13
23330	793	25RB-Mid Rear	Unfold	22.54	23.50	0.284	**0.35**	0.393	**0.49**	0.09
23330	793	25RB-Mid Left	/	22.54	23.50	0.182	**0.23**	0.251	**0.31**	-0.03
23330	793	25RB-Mid Right	/	22.54	23.50	0.316	**0.39**	0.445	**0.56**	-0.07
23330	793	25RB-Mid Bottom	/	22.54	23.50	0.039	**0.05**	0.060	**0.07**	0.03

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

Note2: The LTE mode is QPSK_10MHz.

14.2 WLAN Evaluation for 2.4G

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

Head Evaluation:

Table 14.2-1: SAR Values (WLAN - Head)– 802.11b(Fast SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		**Side**	**Test Position**	**Figure No./ Note**	**Conducted Power (dBm)**	**Max. tune-up Power (dBm)**	**Measured SAR(10g) (W/kg)**	**Reported SAR(10g)(W/kg)**	**Measured SAR(1g) (W/kg)**	**Reported SAR(1g)(W/kg)**	**Power Drift (dB)**
Ch.	MHz										
11	2462	Left	Cheek	Note1	17.16	18.00	0.203	**0.25**	0.332	**0.40**	-0.15
11	2462	Left	Tilt	Note1	17.16	18.00	0.078	**0.09**	0.134	**0.16**	0.06
11	2462	Right	Cheek	Note1	17.16	18.00	0.281	**0.34**	0.492	**0.60**	0.281
11	2462	Right	Tilt	Note1	17.16	18.00	0.083	**0.10**	0.141	**0.17**	-0.03
11	2462	Left	Cheek	Note2	14.66	15.00	0.107	**0.12**	0.178	**0.19**	0.08
11	2462	Left	Tilt	Note2	14.66	15.00	0.041	**0.04**	0.070	**0.08**	-0.06
11	2462	Right	Cheek	Note2	14.66	15.00	0.149	**0.16**	0.261	**0.28**	0.16
11	2462	Right	Tilt	Note2	14.66	15.00	0.046	**0.05**	0.078	**0.08**	0.12

Note1: The results are used for Wifi transmit standalone.

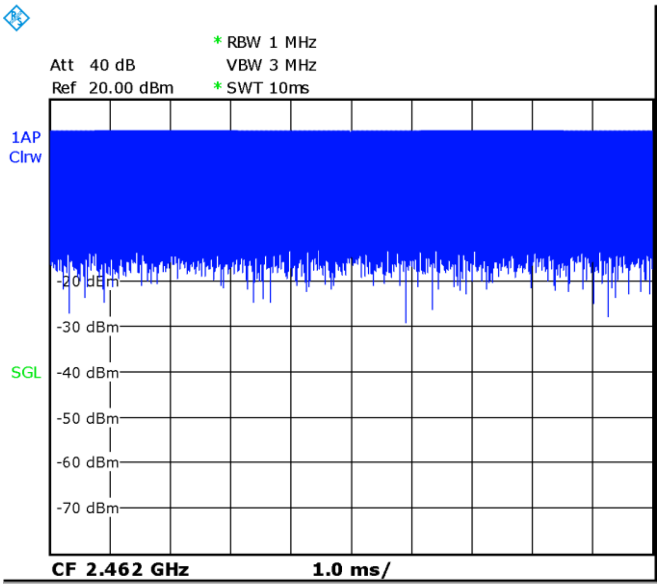
Note2: The results are used for Wifi transmit with WWAN.

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

Table 14.2-2: SAR Values (WLAN - Head)– 802.11b (Full SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°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)
Ch.	MHz										
11	2462	Left	Cheek	/	17.16	18.00	0.207	**0.25**	0.338	**0.41**	-0.15
11	2462	Right	Cheek	Fig.25	17.16	18.00	0.285	**0.35**	0.498	**0.60**	0.02
Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg. Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.											

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



Picture 14.2-1 Duty factor plot

Table 14.2-3: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C							
Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
Ch.	MHz						
11	2462	Right	Cheek	100%	100%	**0.60**	**0.60**

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

Body Evaluation:

Table 14.2-4: SAR Values (WLAN - Body)– 802.11b(Fast SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C											
Frequency		**Test Position**	**Figure No./ Note**	**Conducted Power (dBm)**	**Max. tune-up Power (dBm)**	**Measured SAR(10g) (W/kg)**	**Reported SAR(10g)(W/kg)**	**Measured SAR(1g) (W/kg)**	**Reported SAR(1g)(W /kg)**	**Power Drift (dB)**
Ch.	MHz									
11	2462	Front	Note1	18.75	19.50	0.031	**0.04**	0.058	**0.07**	0.01
11	2462	Rear	Note1	18.75	19.50	0.049	**0.06**	0.092	**0.11**	0.09
11	2462	Front	Note2	18.75	19.50	0.045	**0.05**	0.070	**0.08**	-0.15
11	2462	Rear	Note2	18.75	19.50	0.082	**0.10**	0.155	**0.18**	-0.17
11	2462	Rear	Note2/ Unfold	18.75	19.50	0.050	**0.06**	0.077	**0.09**	0.02
11	2462	Left	Note2	18.75	19.50	0.028	**0.03**	0.046	**0.05**	-0.02
11	2462	Right	Note2	18.75	19.50	0.029	**0.03**	0.049	**0.06**	-0.16
11	2462	Top	Note2	18.75	19.50	0.037	**0.04**	0.062	**0.07**	0.14

Note1: The distance between the EUT and the phantom bottom is 15mm.
Note2: The distance between the EUT and the phantom bottom is 10mm.

As shown above table, the initial test position for body is "Rear 10mm". So the body SAR of WLAN is presented as below:

Table 14.2-5: SAR Values (WLAN - Body)– 802.11b (Full SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
Ch.	MHz									
11	2462	Rear	Fig.26	18.75	19.50	0.086	**0.10**	0.161	**0.19**	-0.17

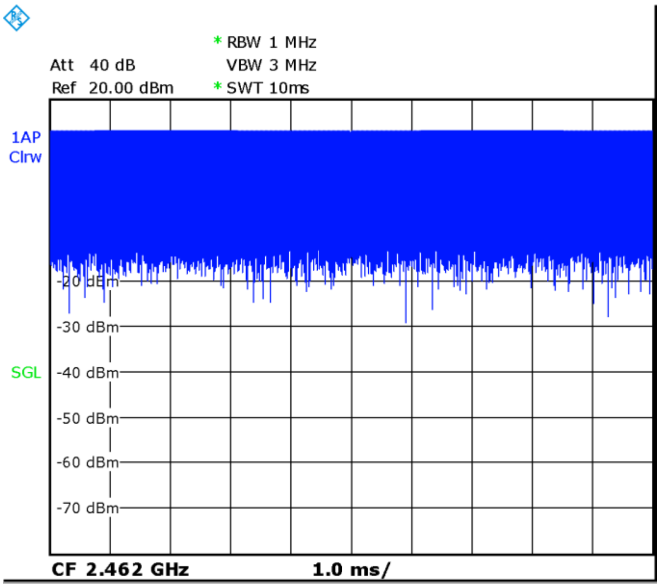
Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg.
Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

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

Table 14.2-6: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C						
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
Ch.	MHz					
11	2462	Rear 10mm	100%	100%	**0.19**	**0.19**

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



Picture 14.2-2 Duty factor plot

15 SAR Measurement Variability

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

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

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20

Table 15.1: SAR Measurement Variability for Body GSM850 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
190	836.6	GPRS(4)	Rear 10mm	1.2	1.15	1.04	/

Table 15.2: SAR Measurement Variability for Body GSM1900 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
512	1850.2	GPRS(2)	Rear 10mm	1.15	1.11	1.04	/

Table 15.3: SAR Measurement Variability for Body WCDMA1900 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
9262	1852.4	RMC	Rear 15mm	1.02	0.989	1.03	/
9262	1852.4	RMC	Rear 15mm/Unfold	0.874	0.856	1.02	/
9400	1880	RMC	Rear 10mm	0.848	0.826	1.03	/
9400	1880	RMC	Rear 10mm/Unfold	0.815	0.806	1.01	/

Table 15.4: SAR Measurement Variability for Body WCDMA1700 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
1513	1752.6	RMC	Rear 15mm	1.06	1.02	1.04	/
1513	1752.6	RMC	Rear 15mm/Unfold	0.917	0.911	1.01	/
1412	1732.4	RMC	Rear 10mm	1.07	1.03	1.04	/
1412	1732.4	RMC	Rear 10mm/Unfold	0.83	0.821	1.01	/

Table 15.5: SAR Measurement Variability for Body WCDMA850 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
4233	846.6	RMC	Rear 10mm	0.912	0.895	1.02	/

Table 15.6: SAR Measurement Variability for Body LTE B2 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
18700	1860	1RB-Mid	Rear 10mm	0.866	0.845	1.02	/

Table 15.7: SAR Measurement Variability for Body LTE B4 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
20300	1745	1RB-Mid	Rear 15mm	0.959	0.936	1.02	/
20175	1732.5	1RB-Mid	Rear 10mm	0.968	0.953	1.02	

Table 15.8: SAR Measurement Variability for Body LTE B5 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
20600	844	1RB-Mid	Rear 10mm	0.966	0.956	1.01	/

Table 15.9: SAR Measurement Variability for Body LTE B14 (1g)

Frequency		Mode	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
23330	793	1RB-Mid	Rear 10mm	0.898	0.874	1.03	/

16 Measurement Uncertainty

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

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

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

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

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43

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

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	N5239A	MY55491241	May 31, 2021	One year
02	Power meter	NRP2	106276	May 11, 2021	One year
03	Power sensor	NRP6A	101369		
04	Signal Generator	E4438C	MY49071430	February 1, 2021	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	166370	June 25, 2021	One year
07	E-field Probe	SPEAG EX3DV4	7548	June 25, 2021	One year
08	DAE	SPEAG DAE4	1331	September 1, 2021	One year
09	Dipole Validation Kit	SPEAG D750V2	1017	July 12,2021	One year
10	Dipole Validation Kit	SPEAG D835V2	4d069	July 12,2021	One year
11	Dipole Validation Kit	SPEAG D1800V2	2d145	July 12,,2021	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d101	July 15,2021	One year
13	Dipole Validation Kit	SPEAG D2450V2	853	July 26,2021	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH128 Right Cheek
Date: 1/20/2022
Electronics: DAE4 Sn1331
Medium: head 835 MHz
Medium parameters used: f = 825 MHz; σ = 0.858 S/m; ε_r = 44.894;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: GSM850 824.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.50 W/kg

Zoom Scan (6x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.861 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.621 W/kg
Maximum value of SAR (measured) = 1.53 W/kg

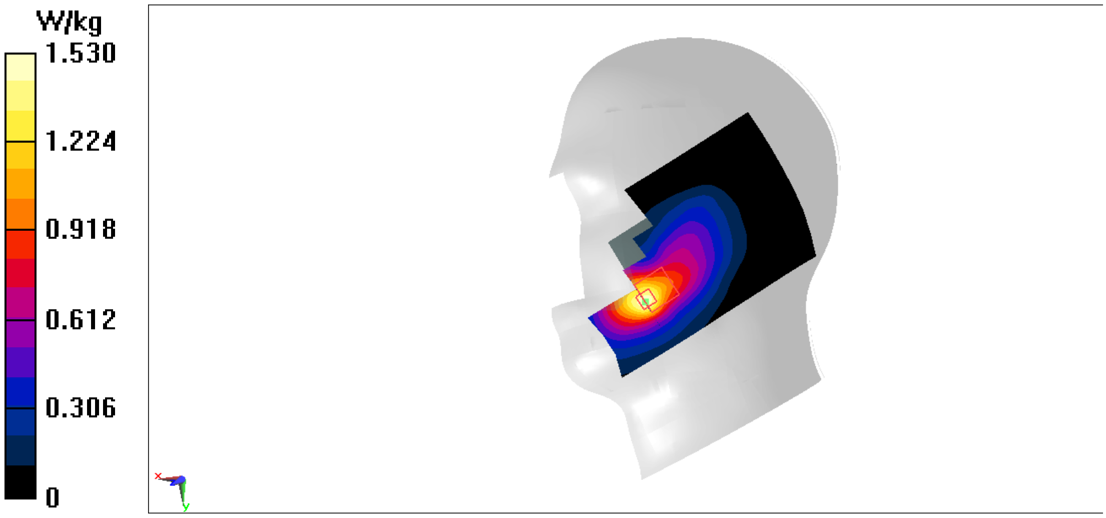


Fig A.1

GSM850_CH128 Rear 10mm
Date: 1/20/2022
Electronics: DAE4 Sn1331
Medium: head 835 MHz
Medium parameters used: f = 825 MHz; σ = 0.858 S/m; ε_r = 44.894;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: GSM850 824.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.53 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 42.60 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.855 W/kg
Maximum value of SAR (measured) = 1.49 W/kg

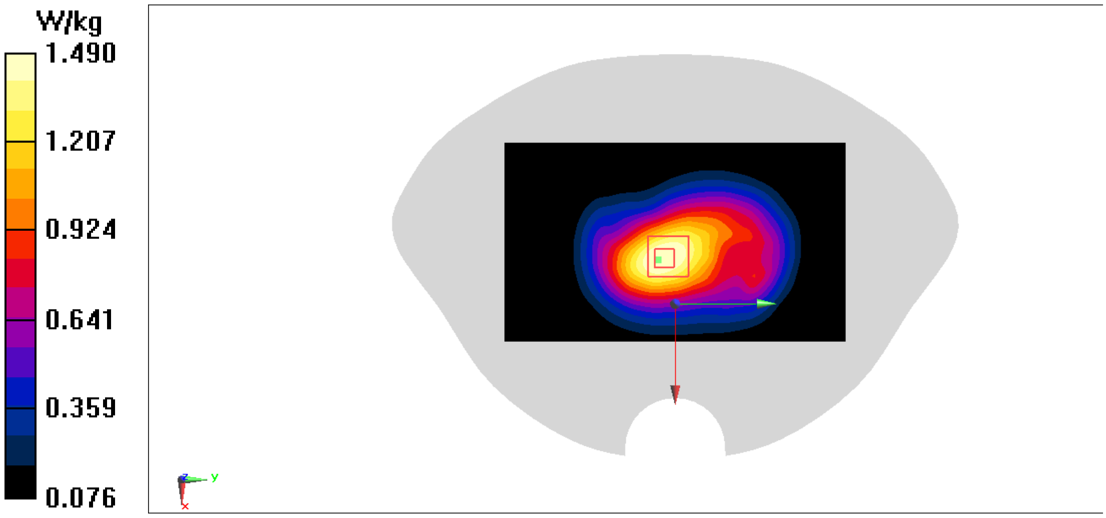


Fig A.2

PCS1900_CH512 Left Cheek
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.421 S/m; ε_r = 42.944;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C,   Liquid Temperature: 22.3°C
Communication System: PCS1900 1850.2 MHz Duty Cycle: 1:4
Probe: EX3DV4 – SN7548 ConvF(7.88,7.88,7.88)

Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.266 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.624 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.315 W/kg
SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.138 W/kg
Maximum value of SAR (measured) = 0.277 W/kg

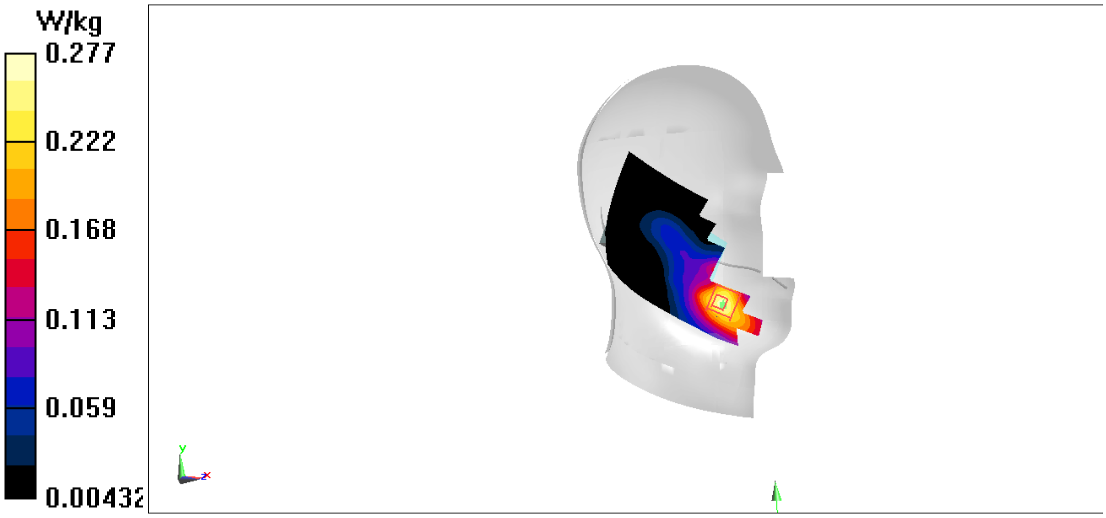


Fig A.3

PCS1900_CH512 Rear 10mm
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.421 S/m; ε_r = 42.944;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: PCS1900 1850.2 MHz Duty Cycle: 1:4
Probe: EX3DV4 – SN7548 ConvF(7.88,7.88,7.88)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.73 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.49 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.94 W/kg
SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.655 W/kg
Maximum value of SAR (measured) = 1.64 W/kg

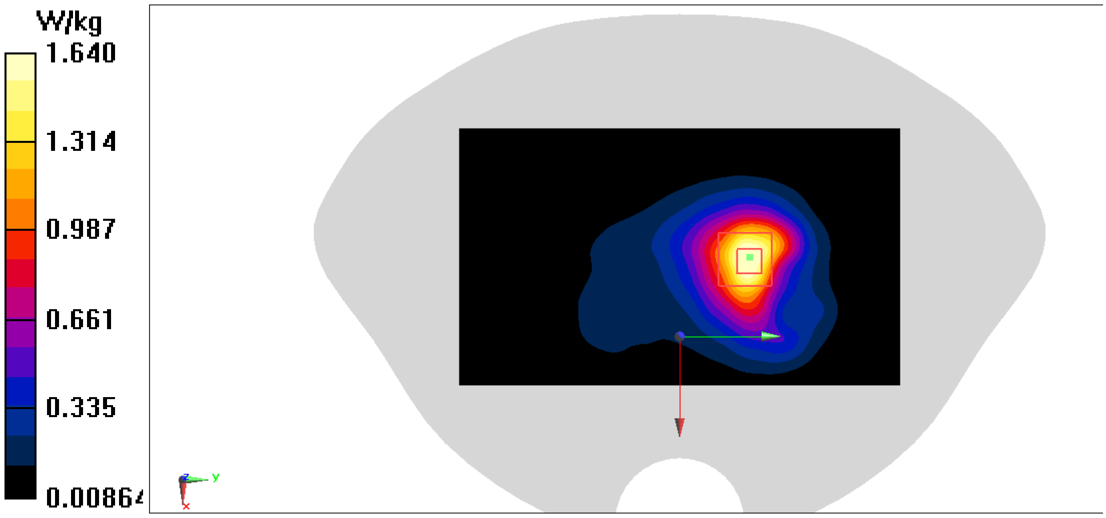


Fig A.4

WCDMA1900-BII_CH9538 Left Cheek
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1907.6 MHz; σ = 1.465 S/m; ε_r = 42.76;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C,   Liquid Temperature: 22.3°C
Communication System: WCDMA1900-BII 1907.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.88,7.88,7.88)

Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.461 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.074 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.538 W/kg
SAR(1 g) = 0.350 W/kg; SAR(10 g) = 0.220 W/kg
Maximum value of SAR (measured) = 0.472 W/kg

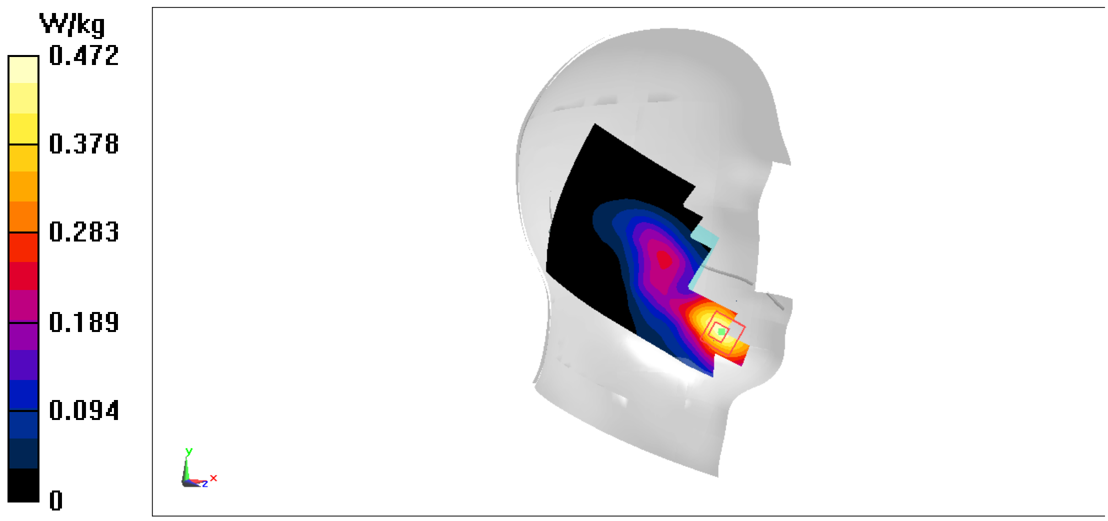


Fig A.5

WCDMA1900-BII_CH9262 Rear 15mm_Body worn
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.422 S/m; ε_r = 42.941;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1900-BII 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.88,7.88,7.88)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.42 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.79 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.597 W/kg
Maximum value of SAR (measured) = 1.40 W/kg

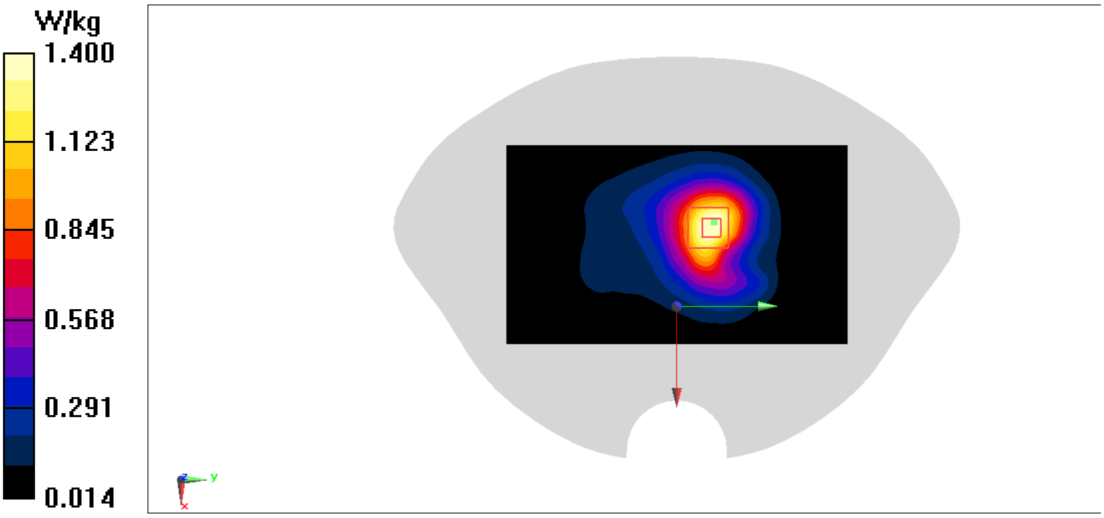


Fig A.6

WCDMA1900-BII_CH9400 Rear 10mm_Hotspot
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.443 S/m; ε_r = 42.876;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1900-BII 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.88,7.88,7.88)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.18 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.03 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.848 W/kg; SAR(10 g) = 0.483 W/kg
Maximum value of SAR (measured) = 1.16 W/kg

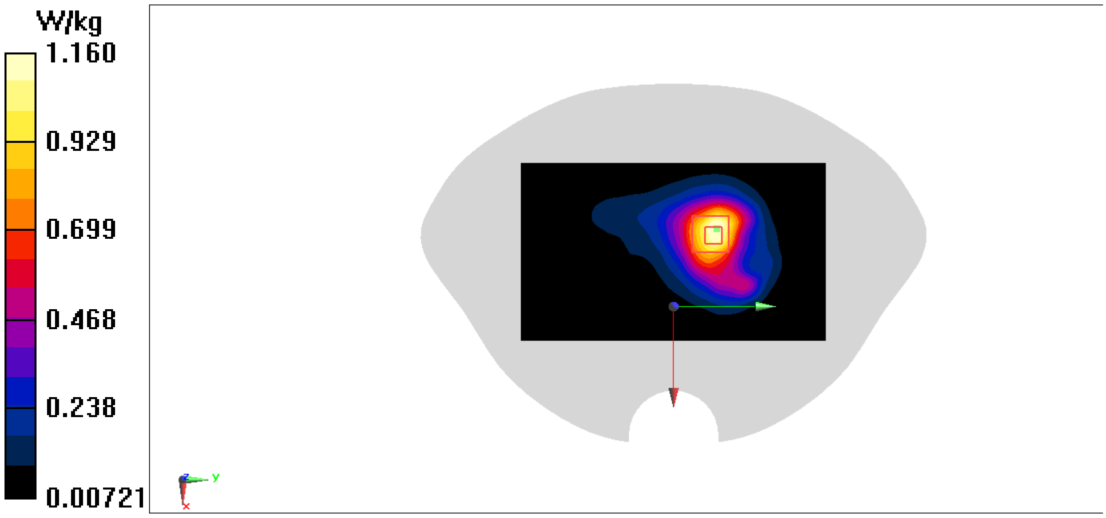


Fig A.7

WCDMA1700-BIV_CH1513 Left Cheek
Date: 1/21/2022
Electronics: DAE4 Sn1331
Medium: head 1800 MHz
Medium parameters used: f = 1752.6 MHz; σ = 1.341 S/m; ε_r = 43.203;ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.423 W/kg

Zoom Scan (6x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.000 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.475 W/kg
SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.220 W/kg
Maximum value of SAR (measured) = 0.415 W/kg

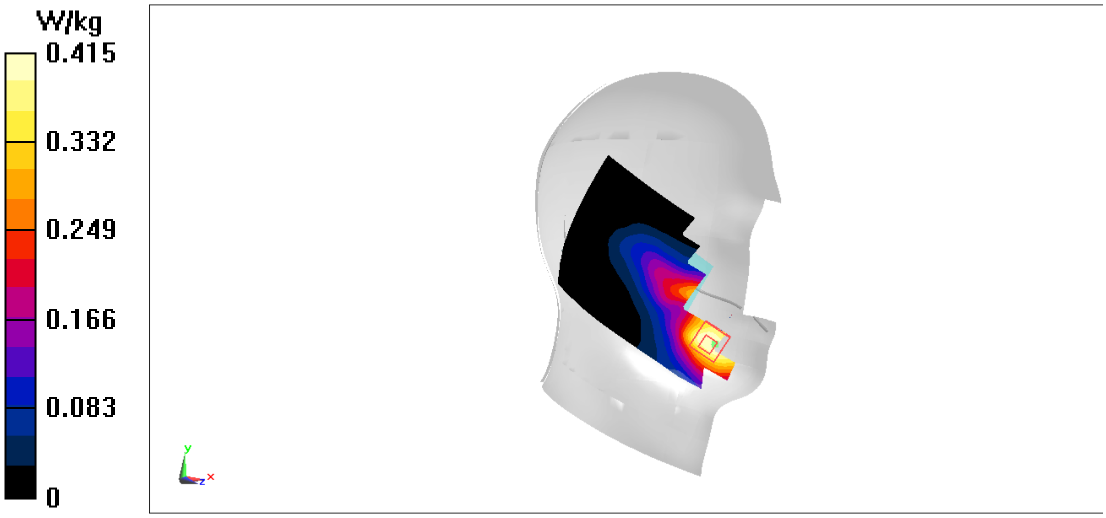


Fig A.8

WCDMA1700-BIV_CH1513 Rear 15mm_Body worn
Date: 1/21/2022
Electronics: DAE4 Sn1331
Medium: head 1800 MHz
Medium parameters used: f = 1752.6 MHz; σ = 1.341 S/m; ε_r = 43.203;ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.64 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.02 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.612 W/kg
Maximum value of SAR (measured) = 1.54 W/kg

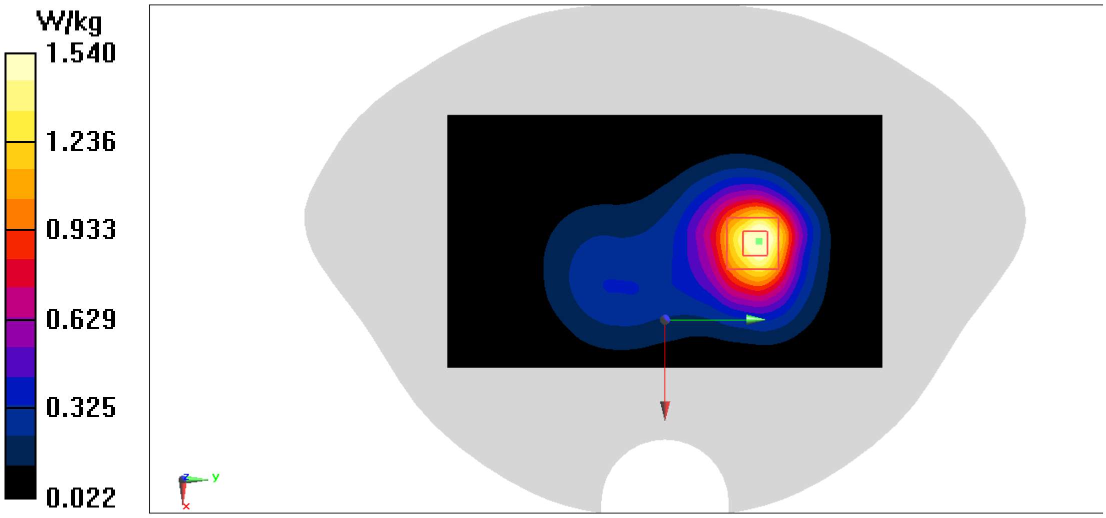


Fig A.9

WCDMA1700-BIV_CH1412 Rear 10mm_Hotspot
Date: 1/21/2022
Electronics: DAE4 Sn1331
Medium: head 1800 MHz
Medium parameters used: f = 1732.4 MHz; σ = 1.323 S/m; ε_r = 43.238;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.67 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.96 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.04 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.576 W/kg
Maximum value of SAR (measured) = 1.61 W/kg

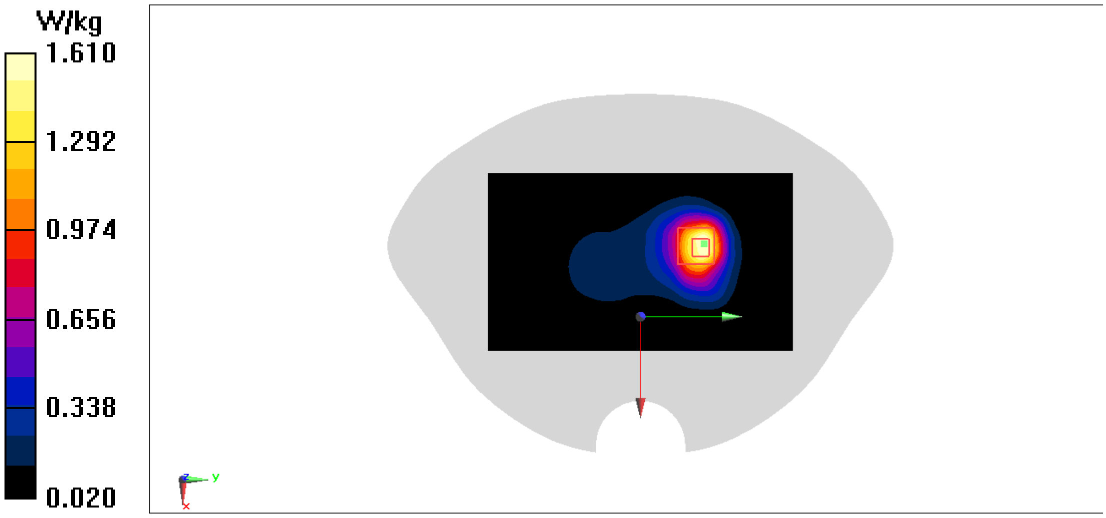


Fig A.10

WCDMA850-BV_CH4233 Right Cheek
Date: 1/20/2022
Electronics: DAE4 Sn1331
Medium: head 835 MHz
Medium parameters used: f = 846.6 MHz; σ = 0.87 S/m; ε_r = 44.906; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA850-BV 846.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.837 W/kg

Zoom Scan (6x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.607 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.584 W/kg; SAR(10 g) = 0.339 W/kg
Maximum value of SAR (measured) = 0.865 W/kg

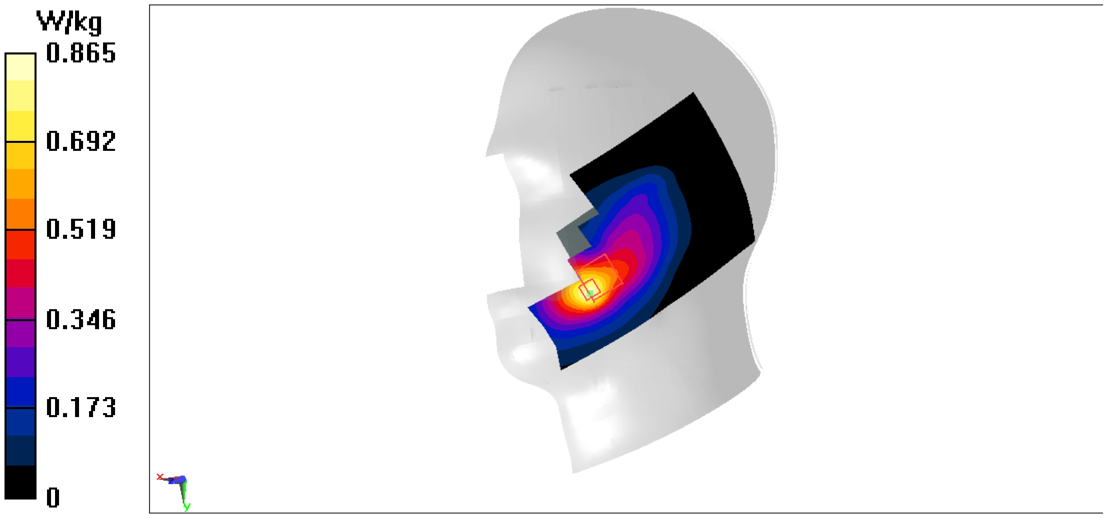


Fig A.11

WCDMA850-BV_CH4233 Rear 10mm
Date: 1/20/2022
Electronics: DAE4 Sn1331
Medium: head 835 MHz
Medium parameters used: f = 846.6 MHz; σ = 0.87 S/m; ε_r = 44.906;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA850-BV 846.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.15 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.51 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.912 W/kg; SAR(10 g) = 0.658 W/kg
Maximum value of SAR (measured) = 1.12 W/kg

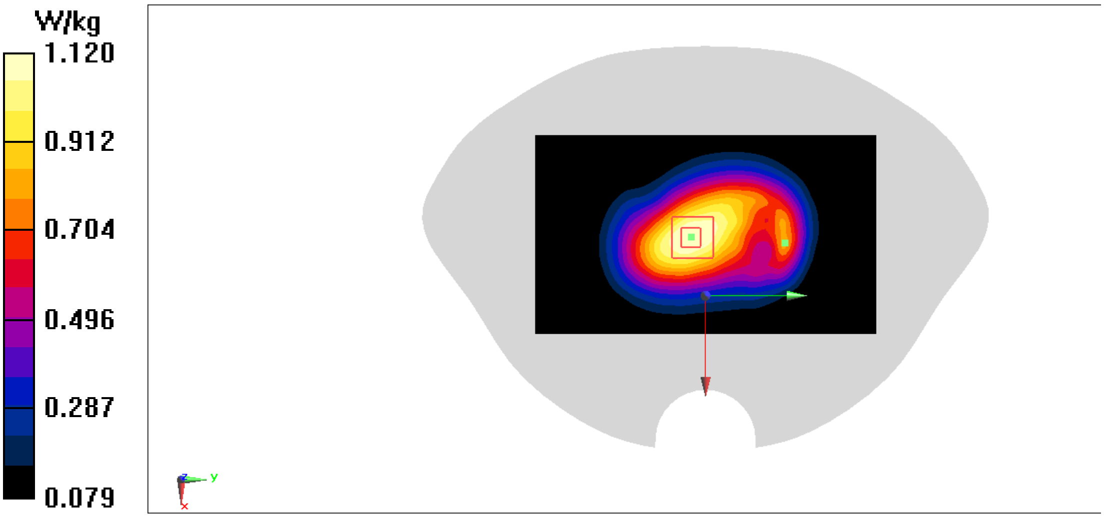


Fig A.12

LTE1900-FDD2_CH18900 Left Cheek
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.455 S/m; ε_r = 42.289; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.88, 7.88, 7.88)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.439 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.634 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.432 W/kg
SAR(1 g) = 0.281 W/kg; SAR(10 g) = 0.173 W/kg

Maximum value of SAR (measured) = 0.377 W/kg

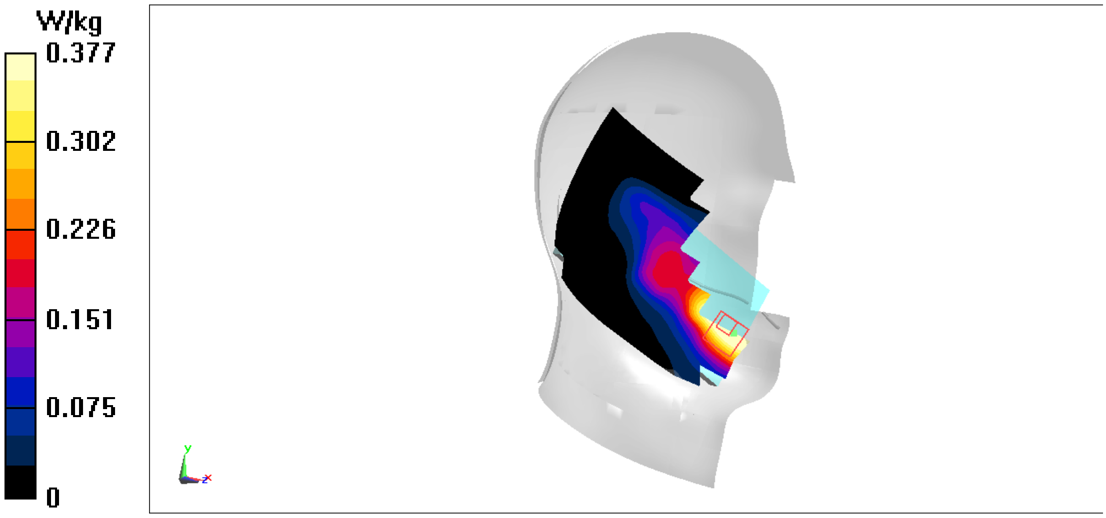


Fig A.13

LTE1900-FDD2_CH18900 Rear 15mm_Body worn

Date: 1/22/2022

Electronics: DAE4 Sn1331

Medium: head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.466 S/m; ε_r = 42.777;ρ = 1000 kg/m^3

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7548 ConvF(7.88, 7.88, 7.88)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.09 W/kg

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

Reference Value = 14.18 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.773 W/kg; SAR(10 g) = 0.453 W/kg

Maximum value of SAR (measured) = 1.10 W/kg

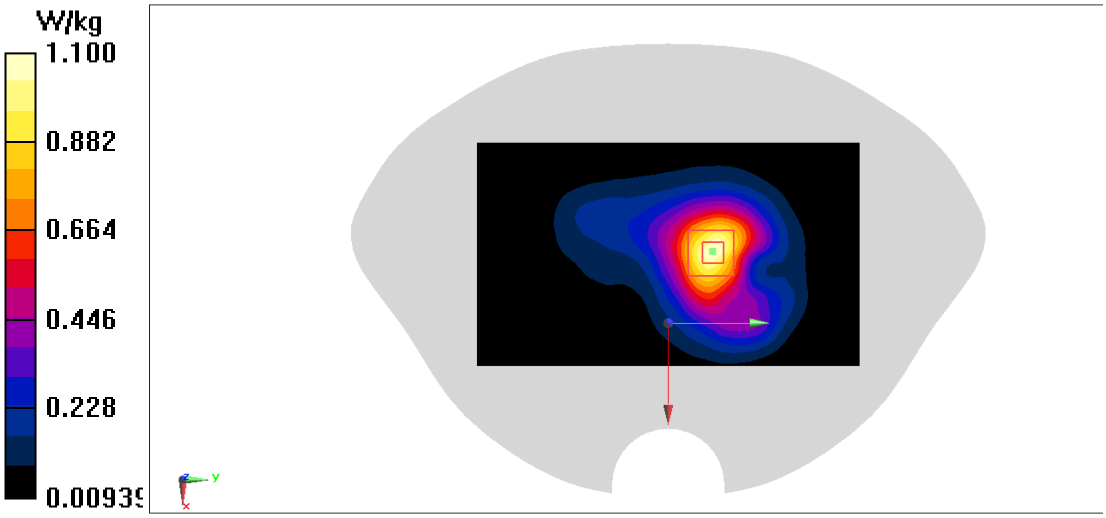


Fig A.14

LTE1900-FDD2_CH18700 Rear 10mm_Hotspot
Date: 1/22/2022
Electronics: DAE4 Sn1331
Medium: head 1900 MHz
Medium parameters used: f = 1860 MHz; σ = 1.532 S/m; ε_r = 42.448;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1900-FDD2 1860 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.88, 7.88, 7.88)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.30 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.499 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.866 W/kg; SAR(10 g) = 0.498 W/kg
Maximum value of SAR (measured) = 1.21 W/kg

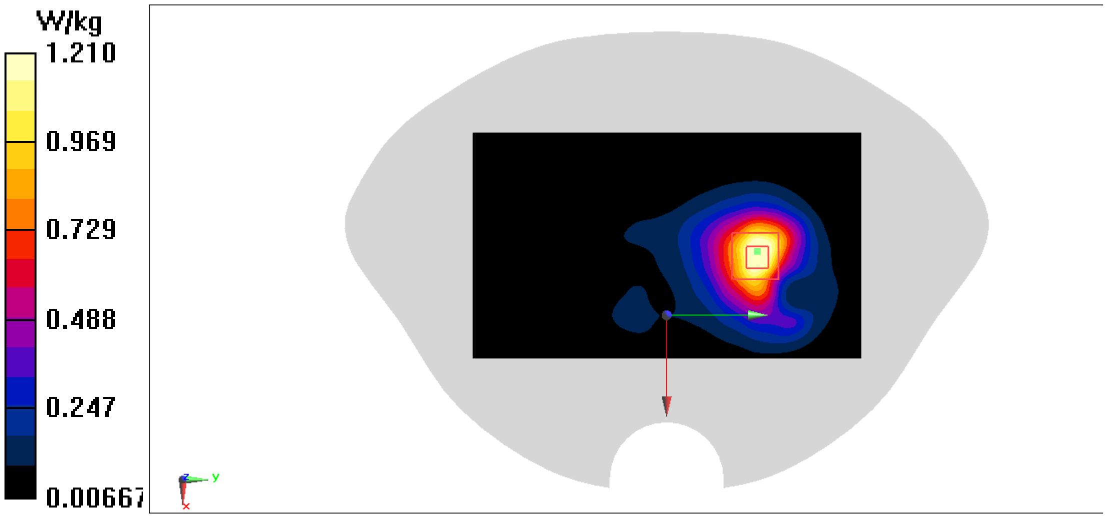


Fig A.15

LTE1700-FDD4_CH20175 Left Cheek
Date: 1/21/2022
Electronics: DAE4 Sn1331
Medium: head 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.374 S/m; ε_r = 42.522; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C,   Liquid Temperature: 22.3°C
Communication System: LTE1700-FDD4 1732.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.428 W/kg

Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.6300 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.443 W/kg
SAR(1 g) = 0.308 W/kg; SAR(10 g) = 0.199 W/kg
Maximum value of SAR (measured) = 0.398 W/kg

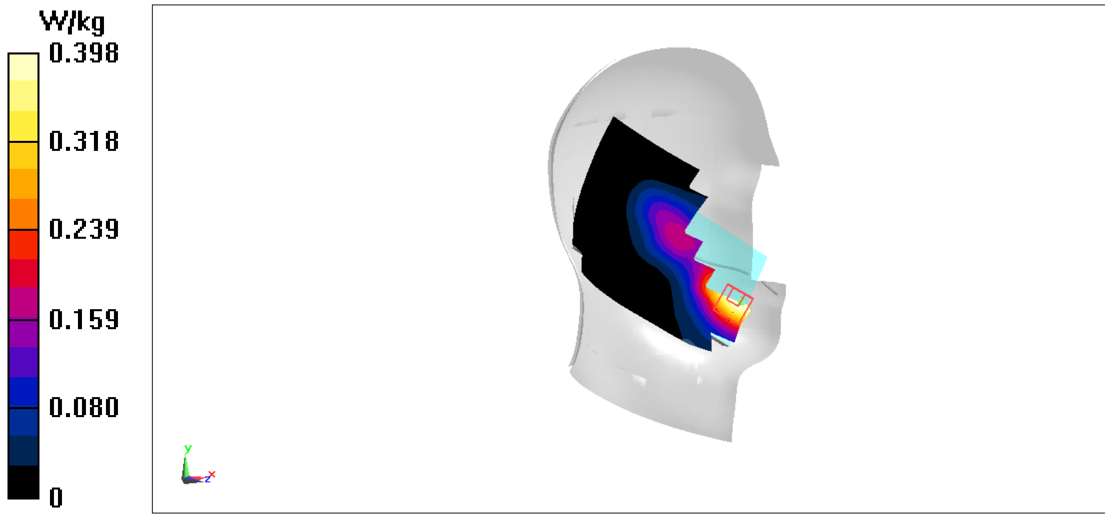


Fig A.16

LTE1700-FDD4_CH20300 Rear 15mm_Body worn
Date: 1/21/2022
Electronics: DAE4 Sn1331
Medium: head 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.522 S/m; ε_r = 43.196;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.44 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.25 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.67 W/kg
SAR(1 g) = 0.959 W/kg; SAR(10 g) = 0.557 W/kg
Maximum value of SAR (measured) = 1.38 W/kg

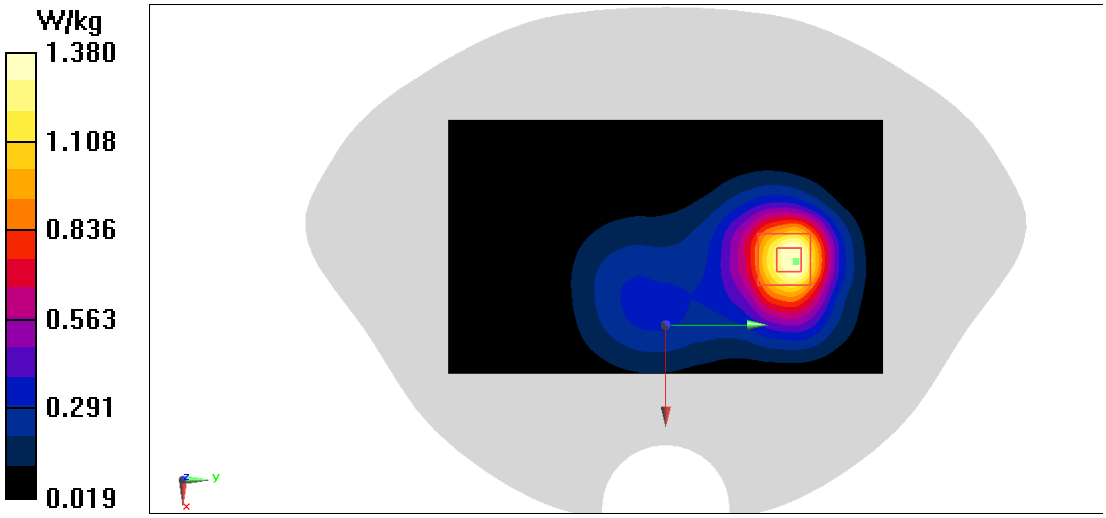


Fig A.17

LTE1700-FDD4_CH20175 Rear 10mm
Date: 1/21/2022
Electronics: DAE4 Sn1331
Medium: head 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.374 S/m; ε_r = 42.522;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1700-FDD4 1732.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.75 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.93 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.81 W/kg
SAR(1 g) = 0.968 W/kg; SAR(10 g) = 0.529 W/kg
Maximum value of SAR (measured) = 1.46 W/kg

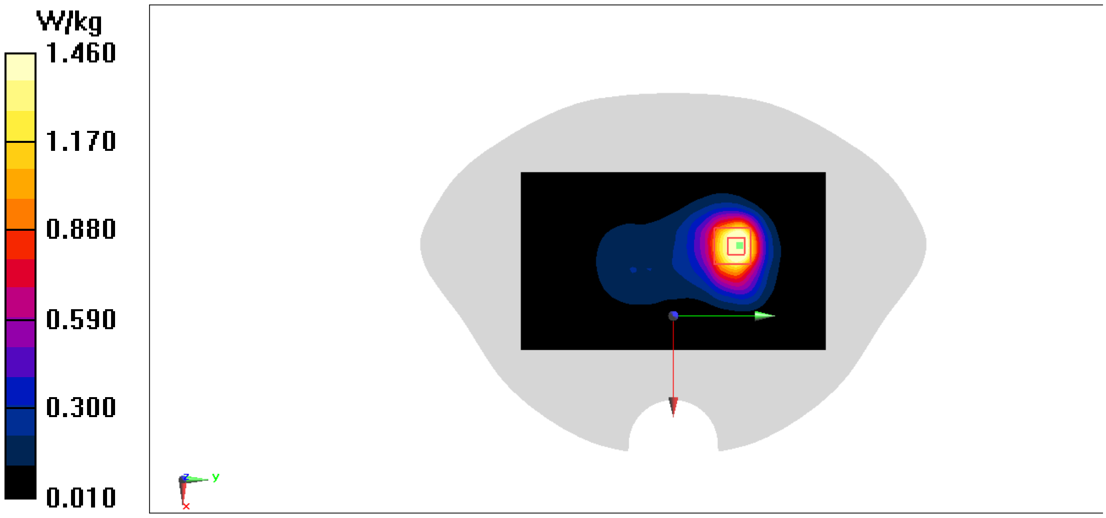


Fig A.18

LTE850-FDD5_CH20600 Right Cheek
Date: 1/20/2022
Electronics: DAE4 Sn1331
Medium: head 835 MHz
Medium parameters used: f = 844 MHz; σ = 0.88 S/m; ε_r = 44.83;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE850-FDD5 844 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36, 10.36, 10.36)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.837 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.665 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.582 W/kg; SAR(10 g) = 0.357 W/kg
Maximum value of SAR (measured) = 0.810 W/kg

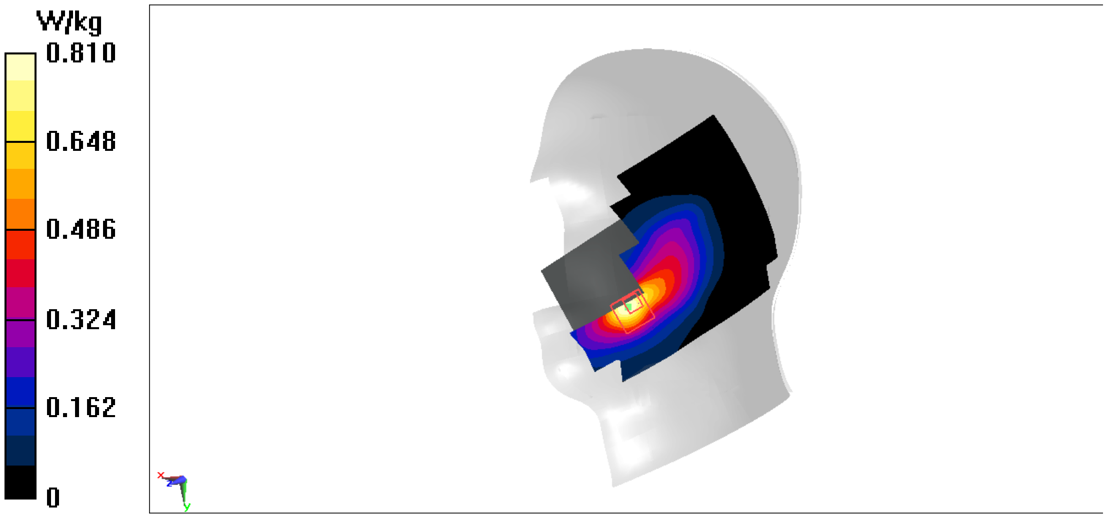


Fig A.19

LTE850-FDD5 _CH20600 Rear 10mm
Date: 1/20/2022
Electronics: DAE4 Sn1331
Medium: head 835 MHz
Medium parameters used: f = 844 MHz; σ = 0.88 S/m; ε_r = 44.83;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE850-FDD26 844 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36, 10.36, 10.36)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.23 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.66 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.966 W/kg; SAR(10 g) = 0.701 W/kg

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

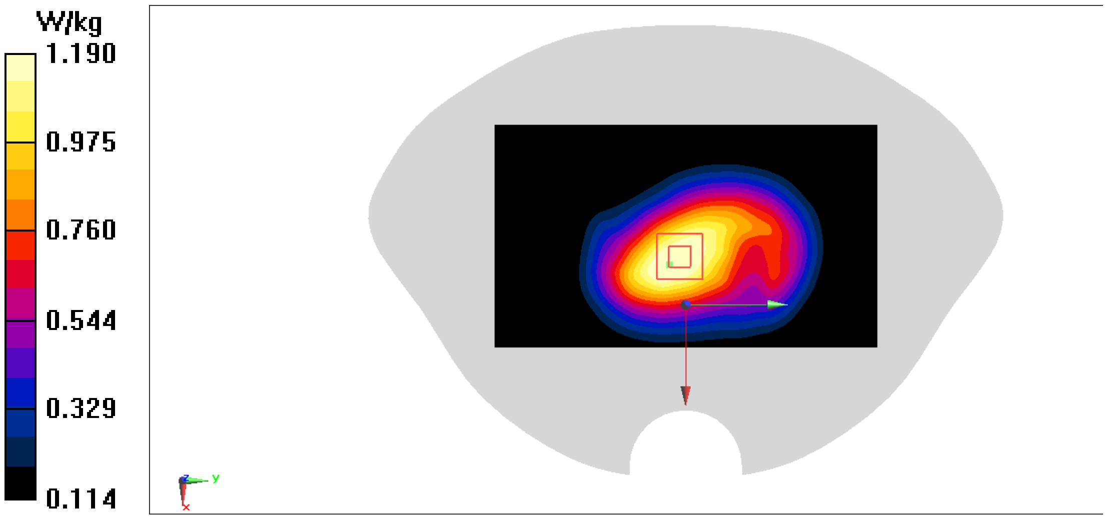


Fig A.20

LTE700-FDD12_CH23095 Right Cheek
Date: 1/19/2022
Electronics: DAE4 Sn1331
Medium: head 750 MHz
Medium parameters used: f = 707.5 MHz; σ = 0.821 S/m; ε_r = 45.323;ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.526 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.228 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.669 W/kg
SAR(1 g) = 0.354 W/kg; SAR(10 g) = 0.217 W/kg
Maximum value of SAR (measured) = 0.530 W/kg

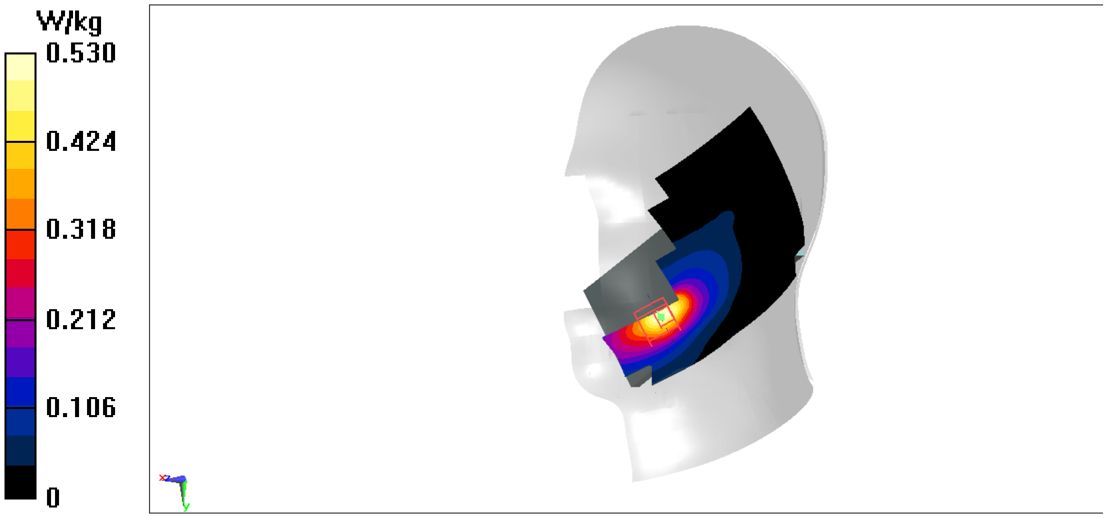


Fig A.21

LTE700-FDD12_CH23095 Rear 10mm
Date: 1/19/2022
Electronics: DAE4 Sn1331
Medium: head 750 MHz
Medium parameters used: f = 707.5 MHz; σ = 0.821 S/m; ε_r = 45.323;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C,   Liquid Temperature: 22.3°C
Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.782 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.23 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.909 W/kg
SAR(1 g) = 0.618 W/kg; SAR(10 g) = 0.443 W/kg
Maximum value of SAR (measured) = 0.795 W/kg

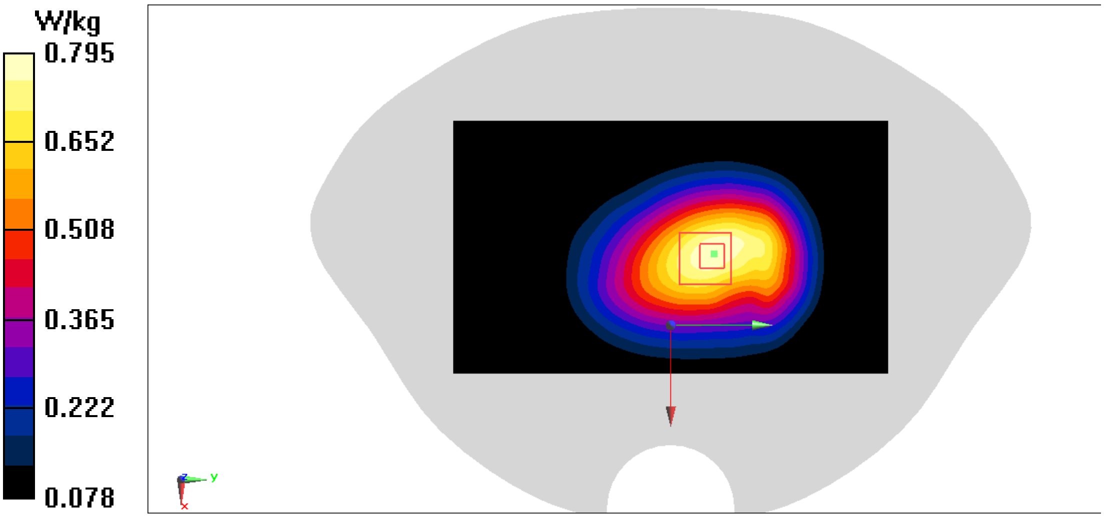


Fig A.22

LTE700-FDD14_CH23330 Right Cheek
Date:1/19/2022
Electronics: DAE4 Sn1331
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.858 S/m; ε_r = 45.017;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.781 W/kg

Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.918 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.984 W/kg
SAR(1 g) = 0.548 W/kg; SAR(10 g) = 0.337 W/kg
Maximum value of SAR (measured) = 0.800 W/kg

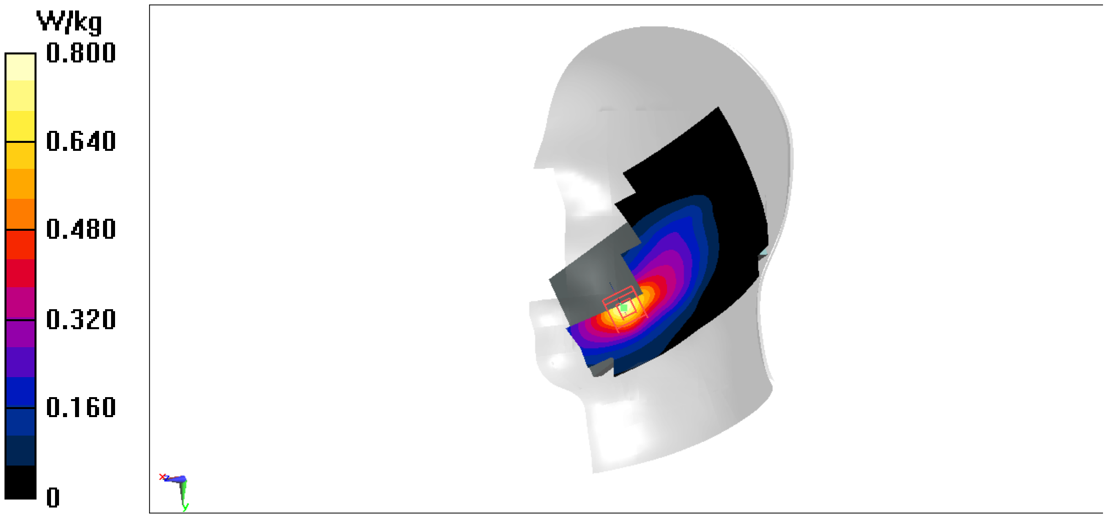


Fig A.23

LTE700-FDD14_CH23330 Rear 10mm
Date:1/19/2022
Electronics: DAE4 Sn1331
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.858 S/m; ε_r = 45.017;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.15 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.31 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.898 W/kg; SAR(10 g) = 0.644 W/kg
Maximum value of SAR (measured) = 1.12 W/kg

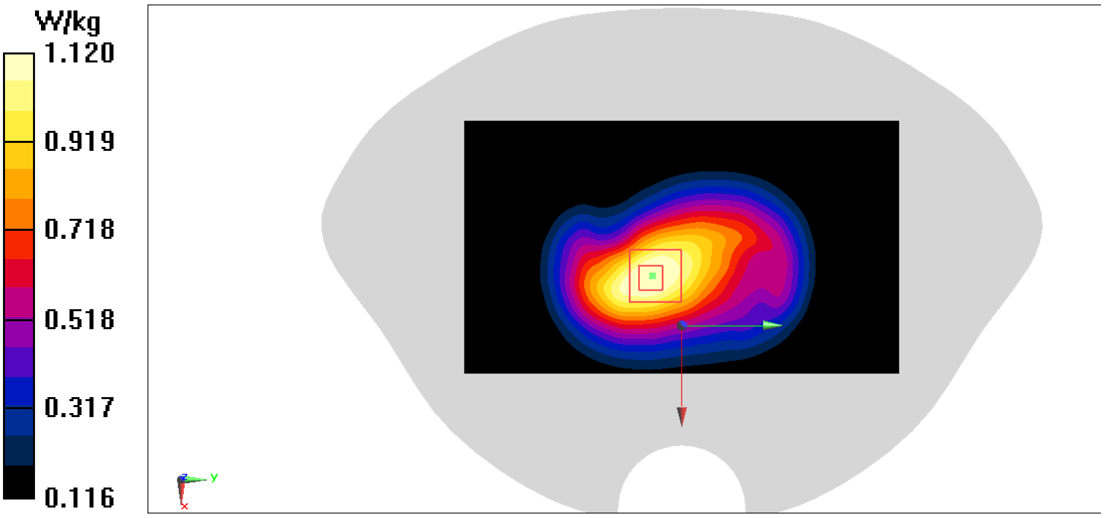


Fig A.24

WLAN2450_CH11 Right Cheek

Date: 1/23/2022

Electronics: DAE4 Sn1331

Medium: head 2450 MHz

Medium parameters used: f = 2462 MHz; σ = 1.926 S/m; ε_r = 41.581;ρ = 1000 kg/m^3

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WLAN2450 2462 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7548 ConvF(7.35,7.35,7.35)

Area Scan (91x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.755 W/kg

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

Reference Value = 4.828 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.498 W/kg; SAR(10 g) = 0.285 W/kg

Maximum value of SAR (measured) = 0.835 W/kg

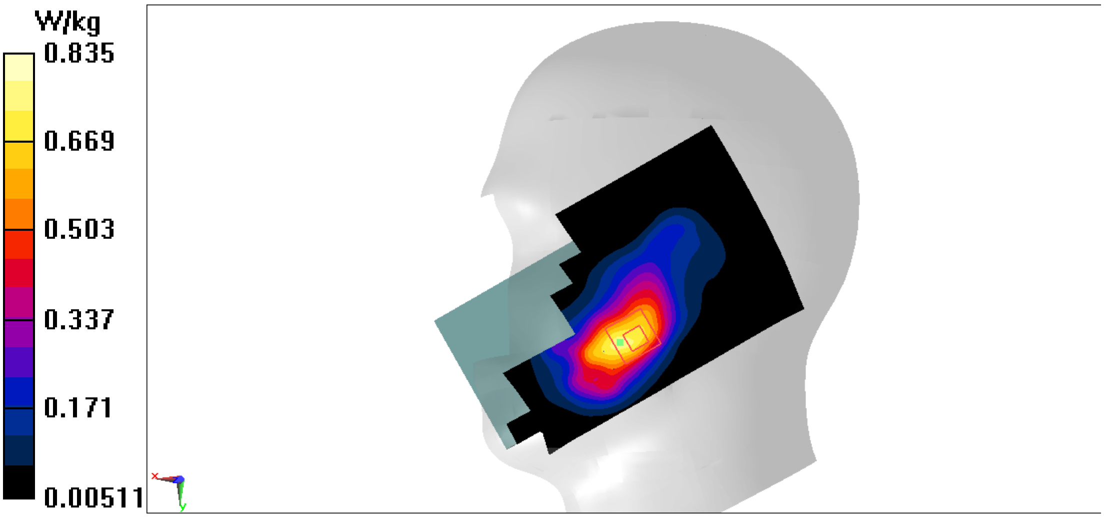


Fig A.25

WLAN2450_CH11 Rear 10mm
Date: 1/23/2022
Electronics: DAE4 Sn1331
Medium: head 2450 MHz
Medium parameters used: f = 2462 MHz; σ = 1.926 S/m; ε_r = 41.581;ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C,   Liquid Temperature: 22.3°C
Communication System: WLAN2450 2462 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.35,7.35,7.35)

Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.253 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.19 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.300 W/kg
SAR(1 g) = 0.161 W/kg; SAR(10 g) = 0.085 W/kg
Maximum value of SAR (measured) = 0.257 W/kg

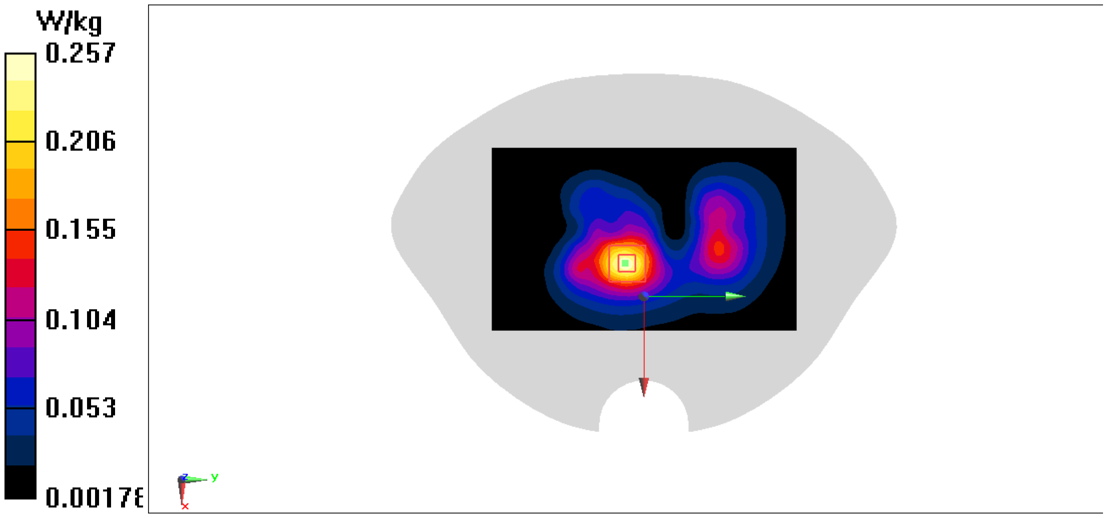
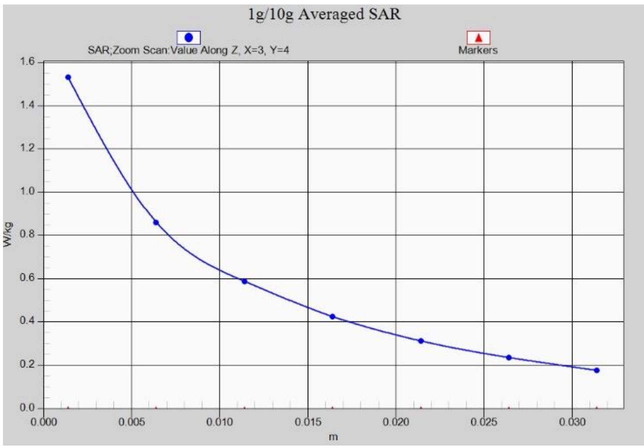
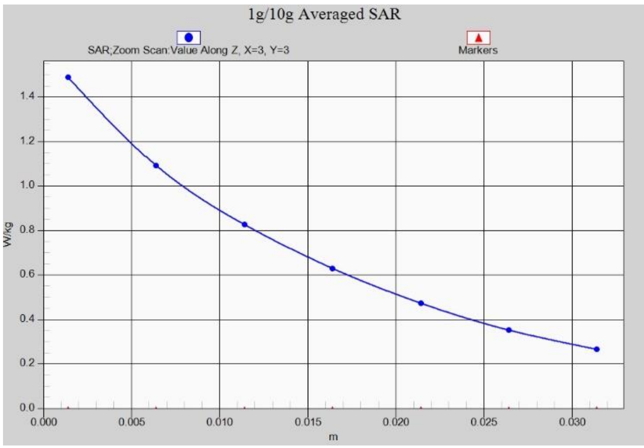


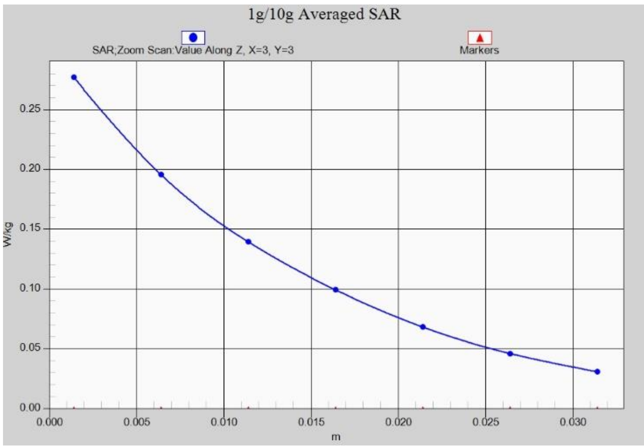
Fig A.26



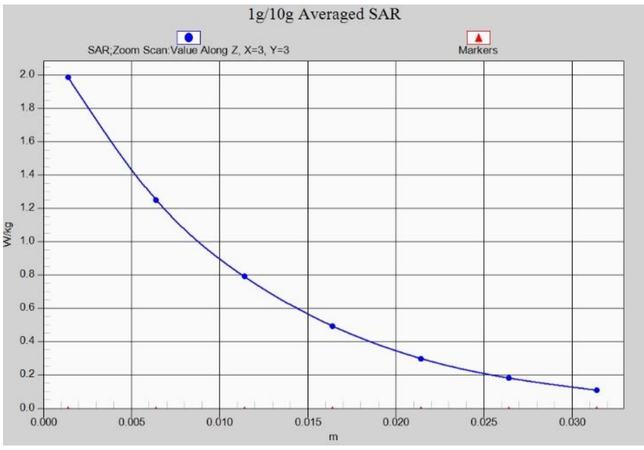
Z-Scan at power reference point (GSM850)



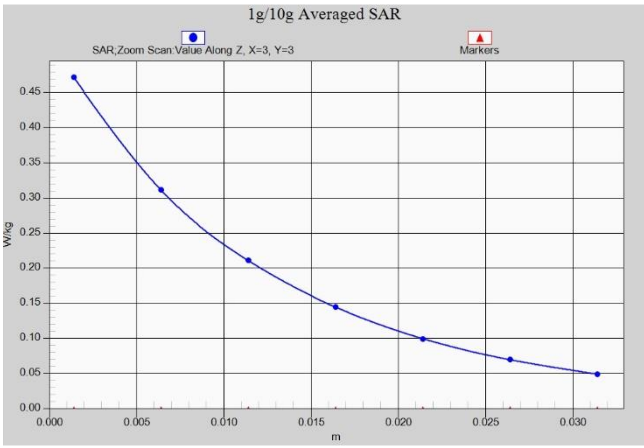
Z-Scan at power reference point (GSM850)



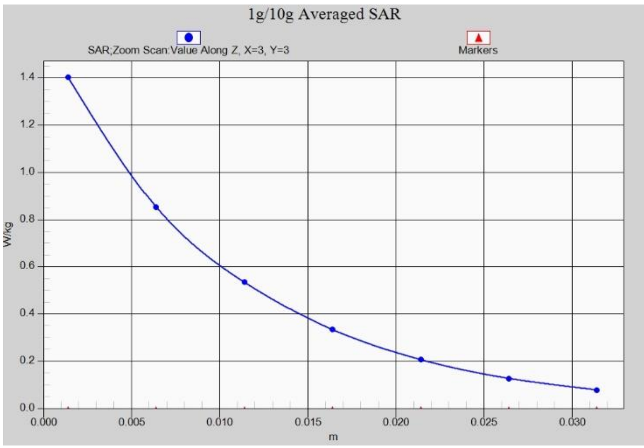
Z-Scan at power reference point (GSM1900)



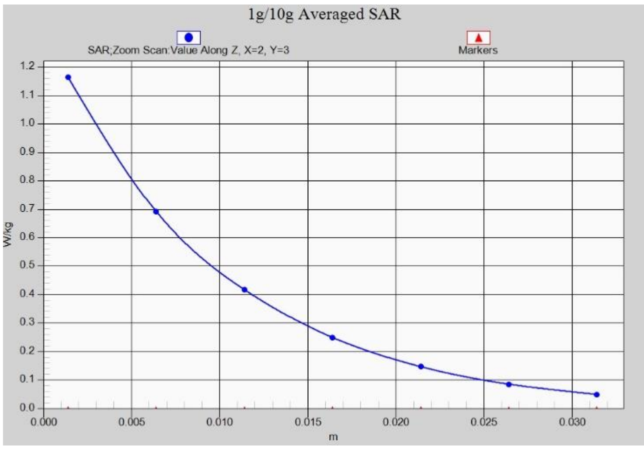
Z-Scan at power reference point (GSM1900)



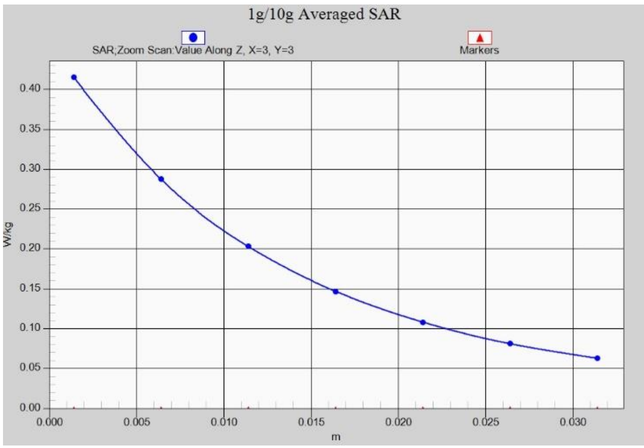
Z-Scan at power reference point (WCDMA1900)



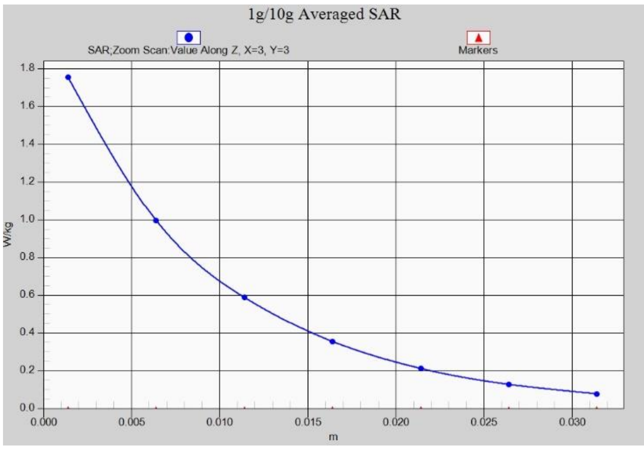
Z-Scan at power reference point (WCDMA1900)



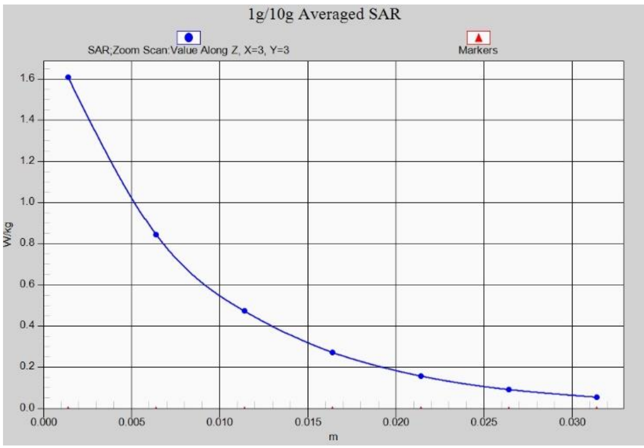
Z-Scan at power reference point (WCDMA1900)



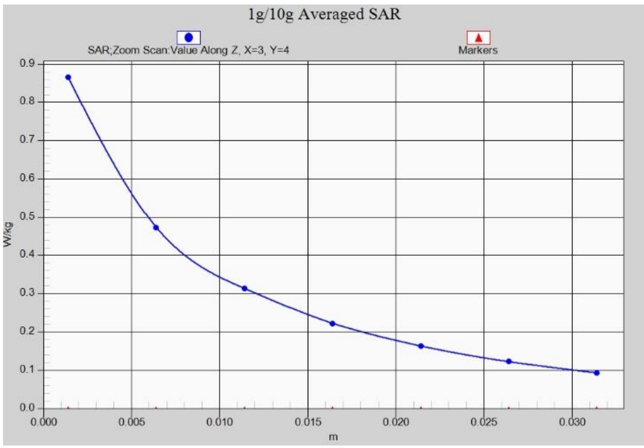
Z-Scan at power reference point (WCDMA1700)



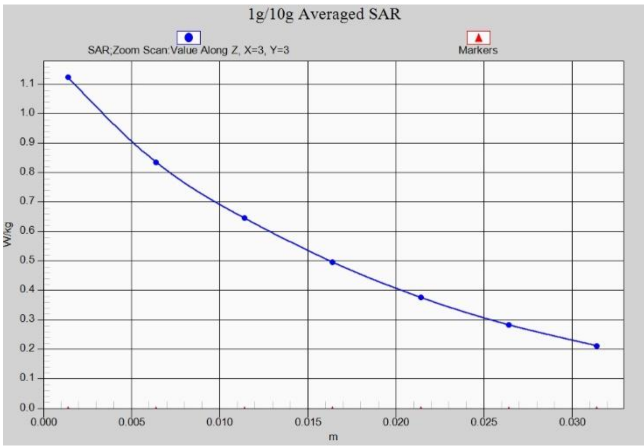
Z-Scan at power reference point (WCDMA1700)



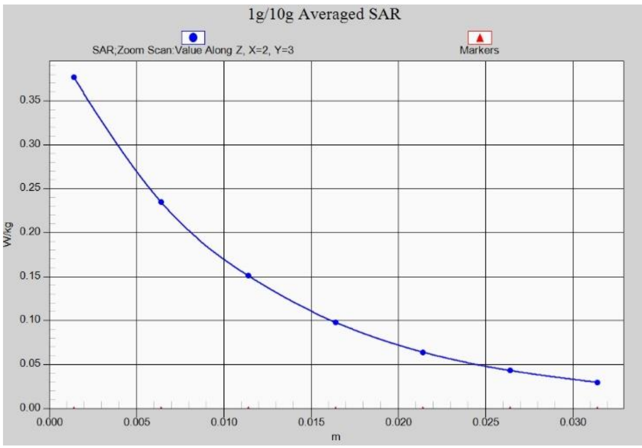
Z-Scan at power reference point (WCDMA1700)



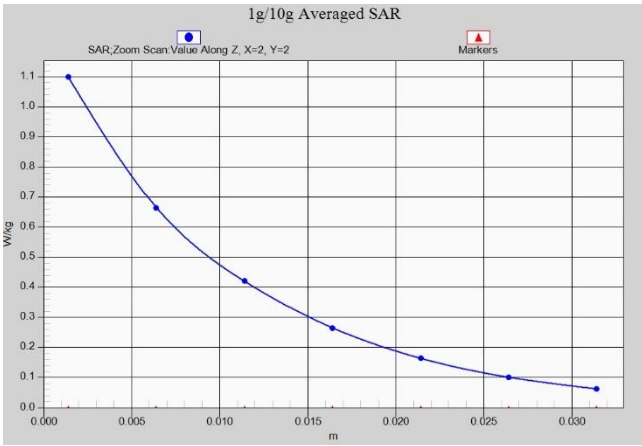
Z-Scan at power reference point (WCDMA850)



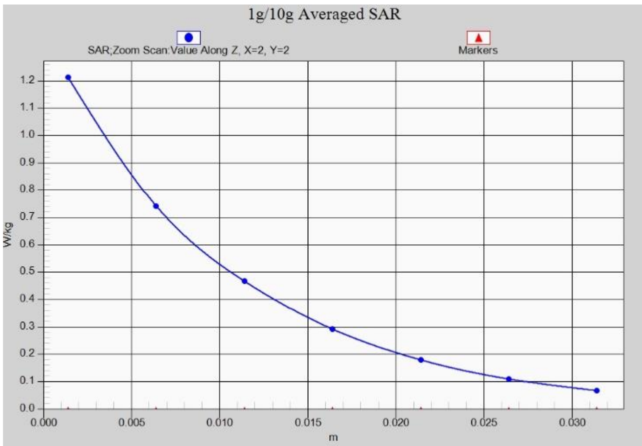
Z-Scan at power reference point (WCDMA850)



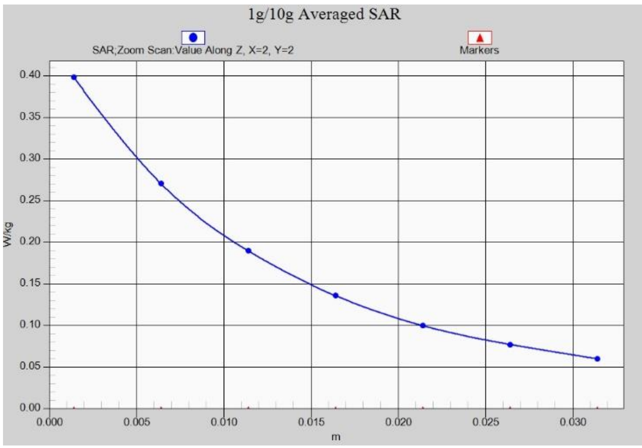
Z-Scan at power reference point (LTEB2)



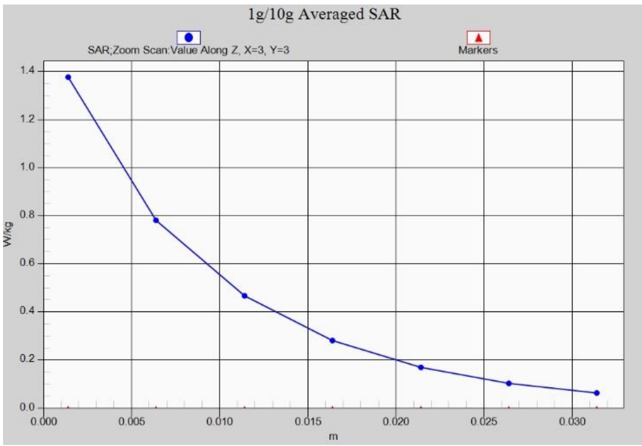
Z-Scan at power reference point (LTEB2)



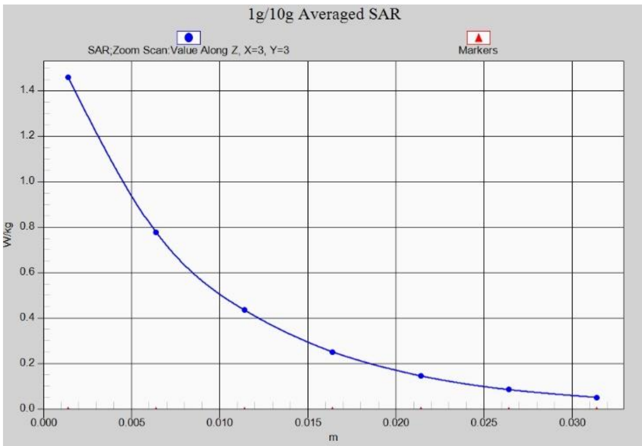
Z-Scan at power reference point (LTEB2)



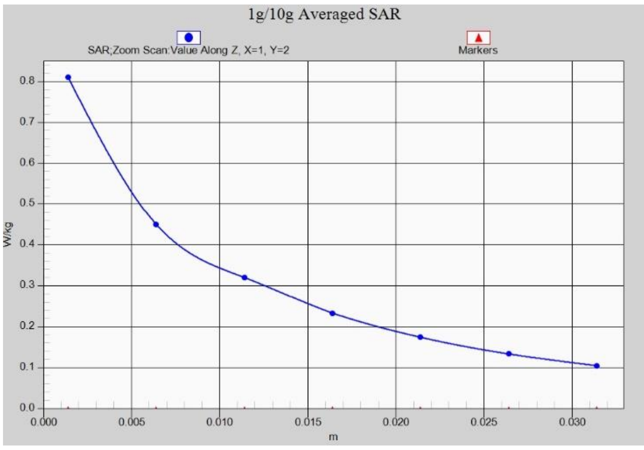
Z-Scan at power reference point (LTEB4)



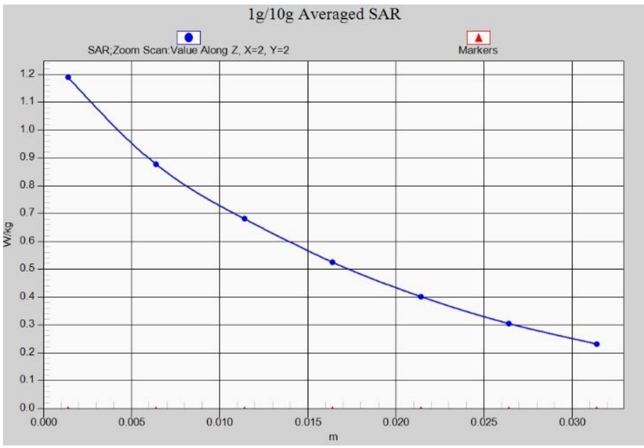
Z-Scan at power reference point (LTEB4)



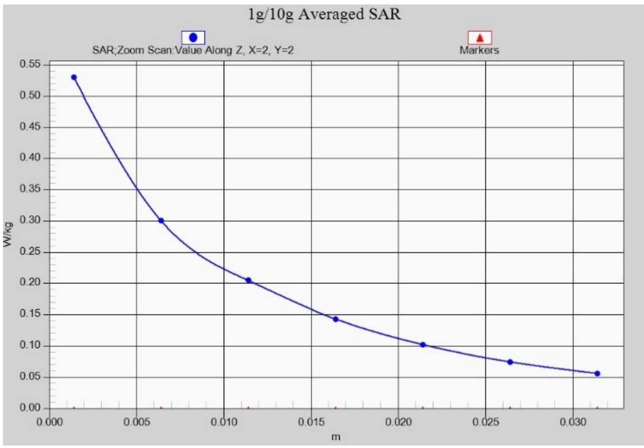
Z-Scan at power reference point (LTEB4)



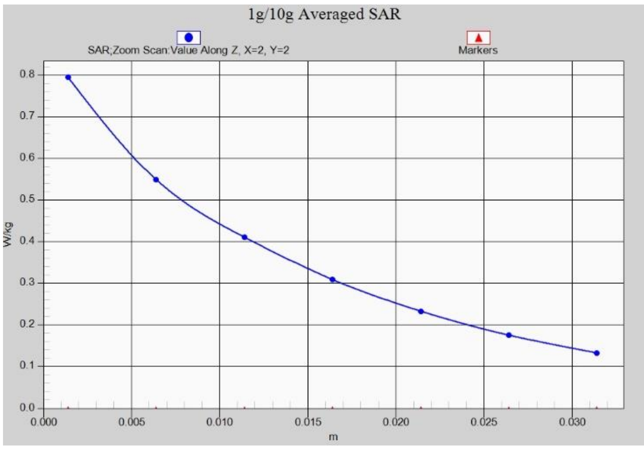
Z-Scan at power reference point (LTEB5)



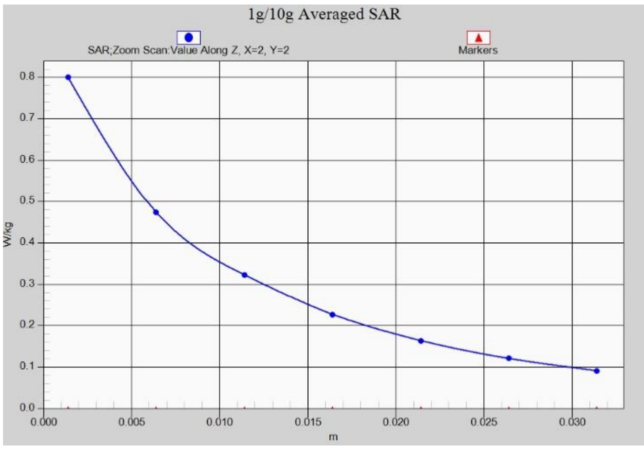
Z-Scan at power reference point (LTEB5)



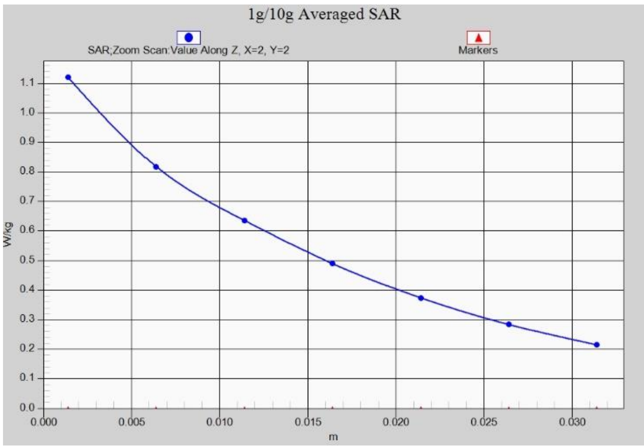
Z-Scan at power reference point (LTEB12)



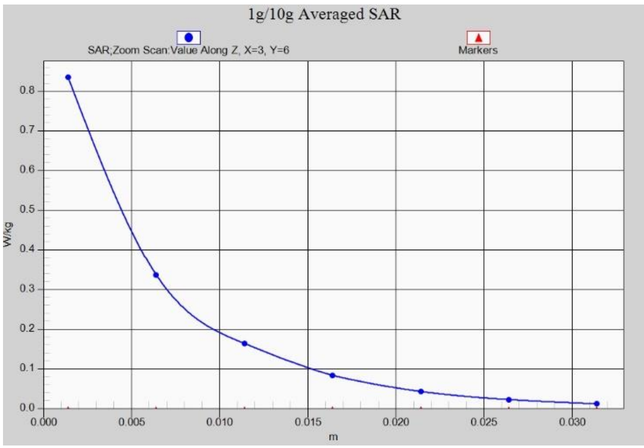
Z-Scan at power reference point (LTEB12)



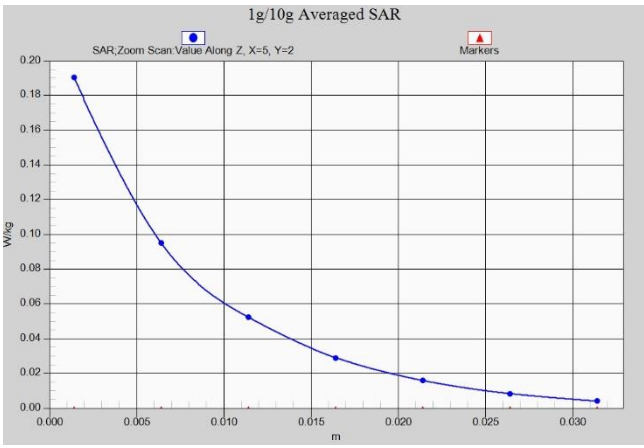
Z-Scan at power reference point (LTEB14)



Z-Scan at power reference point (LTEB14)



Z-Scan at power reference point (WIFI2.4G)



Z-Scan at power reference point (WIFI2.4G)

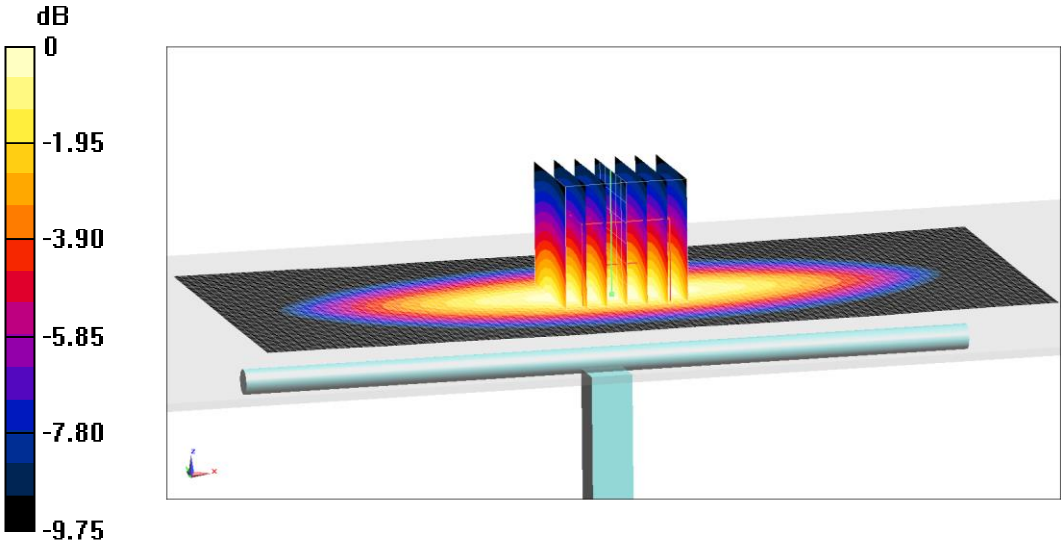
ANNEX B System Verification Results

750MHz

Date: 2022-1-19
Electronics: DAE4 Sn1331
Medium: Head 750MHz
Medium parameters used: f = 750MHz; σ =0.8459 mho/m; ε_r = 45.89; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22ºC
Communication System: CW Frequency: 750MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36,10.36,10.36)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =60.76 V/m; Power Drift = -0.15 dB
Fast SAR: SAR(1 g) = 2.19 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (interpolated) = 2.8 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.76 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 3.28 W/kg
SAR(1 g) = 2.23 W/kg; SAR(10 g) = 1.46 W/kg
Maximum value of SAR (measured) = 3.02 W/kg



0 dB = 3.02 W/kg = 4.8 dB W/kg

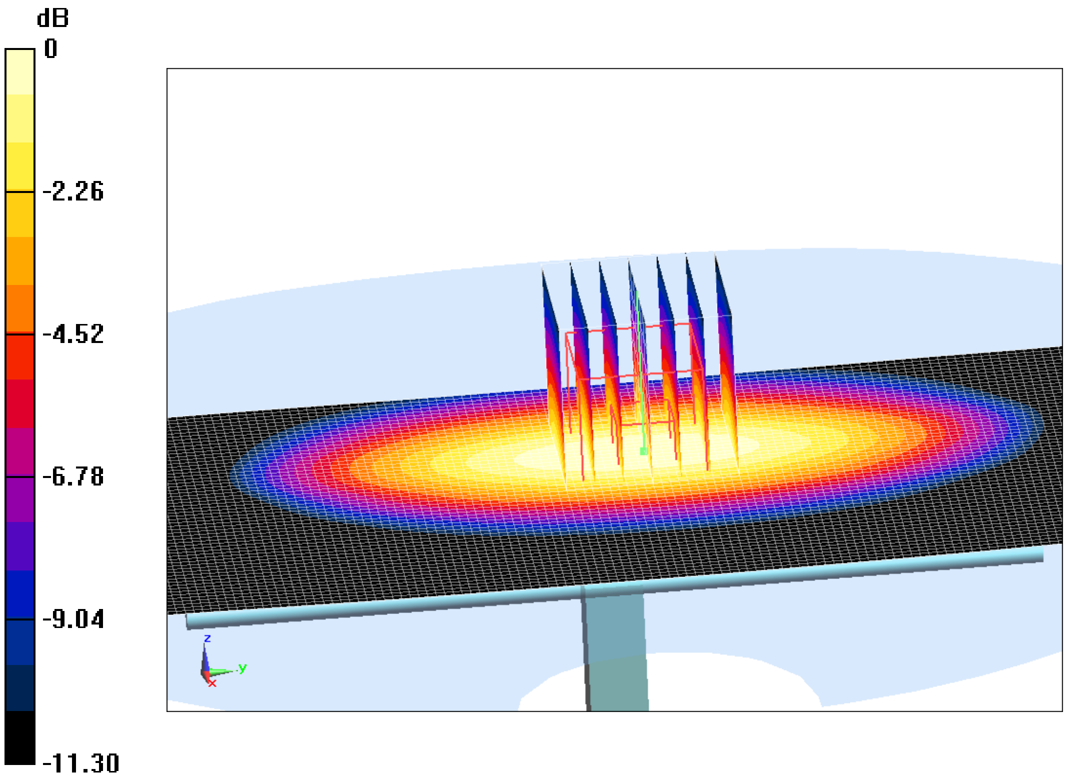
Fig.B.1 validation 750MHz 250mW

835MHz

Date: 2022-1-20
Electronics: DAE4 Sn1331
Medium: Head 835MHz
Medium parameters used: f = 835MHz; σ =0.8797 mho/m; ε_r = 45.55; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22ºC
Communication System: CW Frequency: 835MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.36, 10.36, 10.36)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =64.69 V/m; Power Drift =0.09 dB
Fast SAR: SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.51 W/kg
Maximum value of SAR (interpolated) = 3.47 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =64.69 V/m; Power Drift =0.09 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 3.63 W/kg



0 dB = 3.63 W/kg = 5.6 dB W/kg

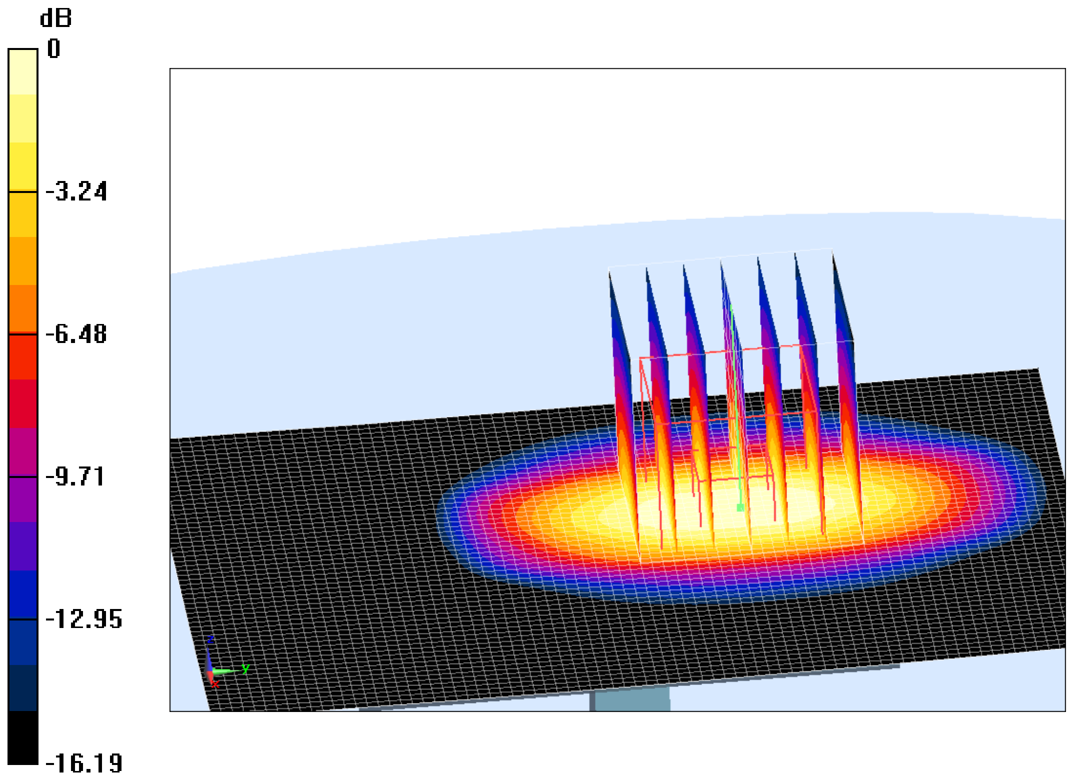
Fig.B.2 validation 835MHz 250mW

1800MHz

Date: 2022-1-21
Electronics: DAE4 Sn1331
Medium: Head 1800MHz
Medium parameters used: f = 1800MHz; σ =1.459 mho/m; ε_r = 42.96; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22ºC
Communication System: CW Frequency: 1800MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.14,8.14,8.14)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 109.22 V/m; Power Drift = 0.07dB
Fast SAR: SAR(1 g) = 9.69 W/kg; SAR(10 g) = 5.13 W/kg
Maximum value of SAR (interpolated) = 15.45W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.22 V/m; Power Drift = 0.07dB
Peak SAR (extrapolated) = 18.88 W/kg
SAR(1 g) = 9.77 W/kg; SAR(10 g) = 5.15 W/kg
Maximum value of SAR (measured) = 15.92 W/kg



0 dB = 15.92 W/kg = 12.02 dB W/kg

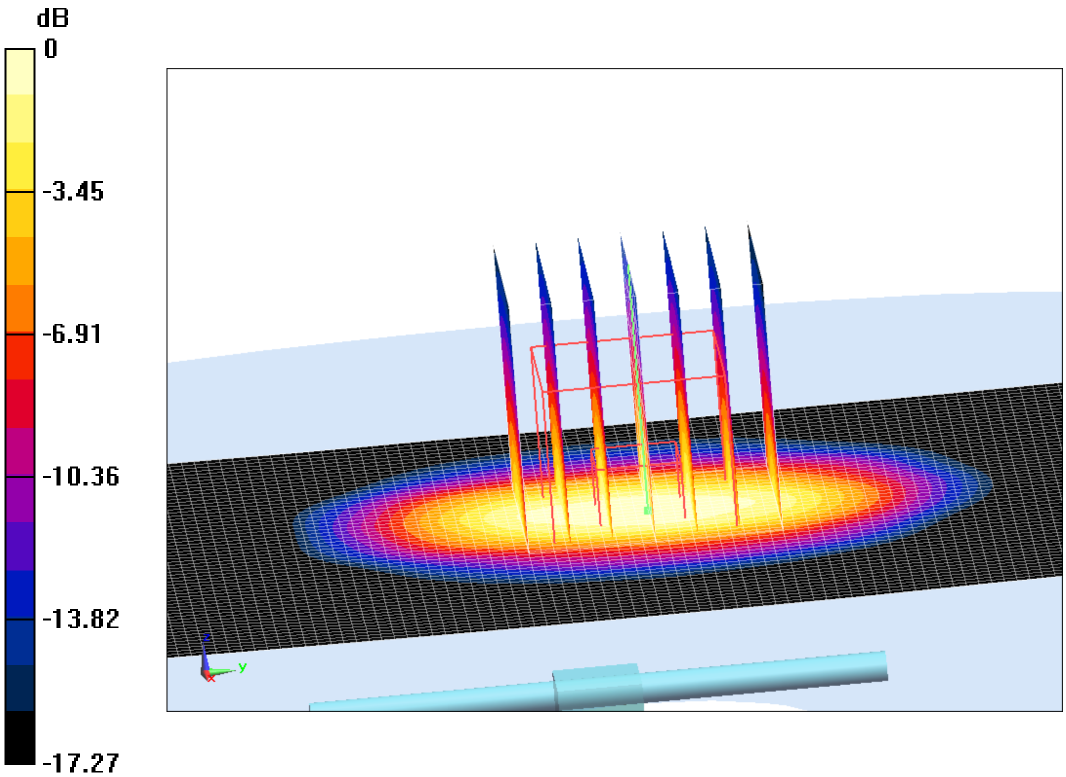
Fig.B.3 validation 1800MHz 250mW

1900MHz

Date: 2022-1-22
Electronics: DAE4 Sn1331
Medium: Head 1900MHz
Medium parameters used: f = 1900MHz; σ =1.527 mho/m; ε_r = 42.79; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22ºC
Communication System: CW Frequency: 1900MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.88,7.88,7.88)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =106.23 V/m; Power Drift = -0.13 dB
Fast SAR: SAR(1 g) = 9.85 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (interpolated) = 15.78 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =106.23 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 18.39 W/kg
SAR(1 g) = 9.79 W/kg; SAR(10 g) = 5.12 W/kg
Maximum value of SAR (measured) = 15.41 W/kg



0 dB = 15.41 W/kg = 11.88 dB W/kg

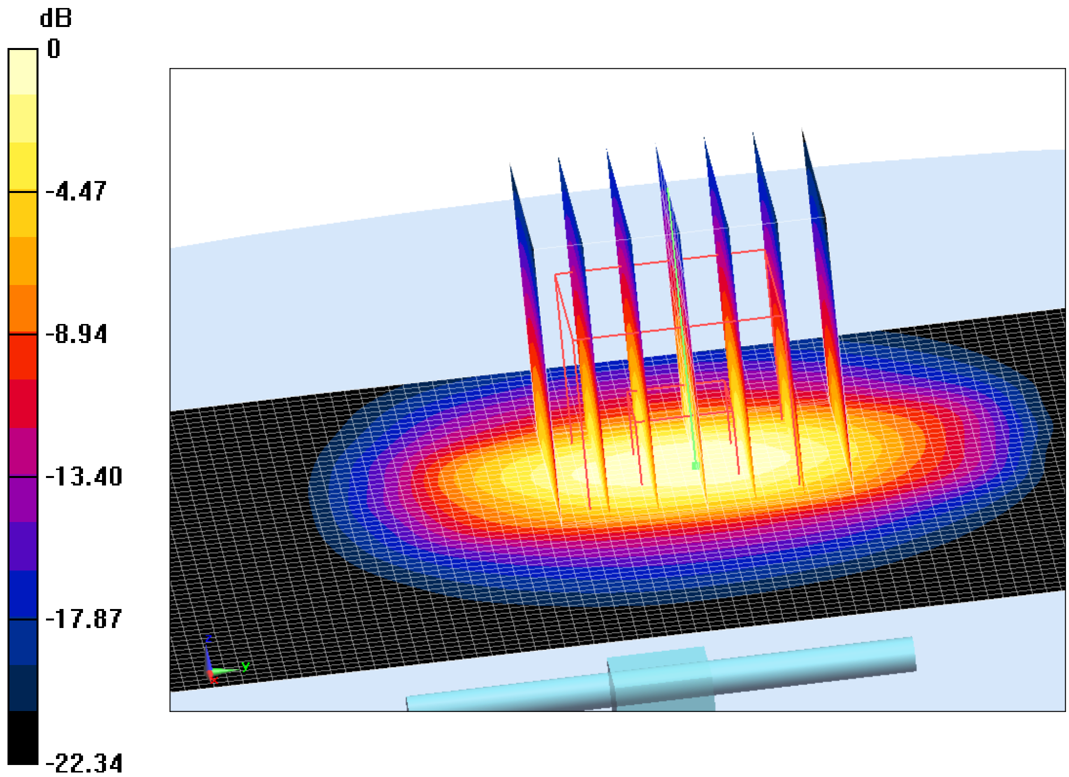
Fig.B.4 validation 1900MHz 250mW

2450MHz

Date: 2022-1-23
Electronics: DAE4 Sn1331
Medium: Head 2450MHz
Medium parameters used: f = 2450MHz; σ =1.963 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22ºC
Communication System: CW Frequency: 2450MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.35,7.35,7.35)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =114.47 V/m; Power Drift = -0.11 dB
Fast SAR: SAR(1 g) = 13.32 W/kg; SAR(10 g) = 6.23 W/kg
Maximum value of SAR (interpolated) = 22.36 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =114.47 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 25.43W/kg
SAR(1 g) = 13.21 W/kg; SAR(10 g) = 6.15W/kg
Maximum value of SAR (measured) = 21.23 W/kg



0 dB = 21.23 W/kg = 13.27 dB W/kg

Fig.B.5 validation 2450MHz 250mW

The SAR system verification must be required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR.

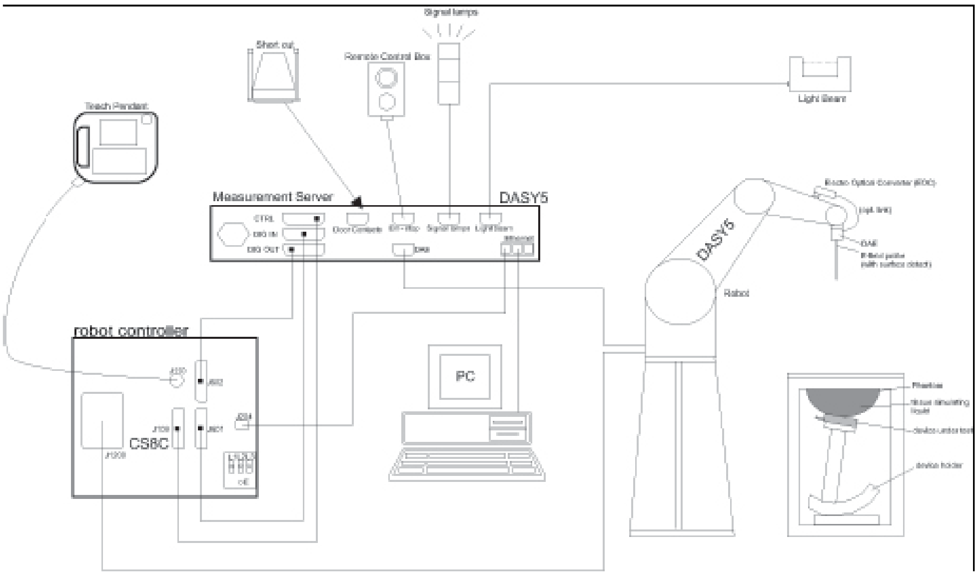
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2022-1-19	750 MHz	Head	2.19	2.23	-1.79
2022-1-20	835 MHz	Head	2.41	2.38	1.26
2022-1-21	1800 MHz	Head	9.69	9.77	-0.82
2022-1-22	1900 MHz	Head	9.85	9.79	0.61
2022-1-23	2450 MHz	Head	13.32	13.21	0.83

ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

The Dasy4 or DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (StäubliTX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY4 or DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

C.2 Dasy4 or DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 or DASY5 software reads the reflection durning a software approach and looks for the maximum using 2nd ord curve fitting. The approach is stopped at reaching the maximum.

Picture C.2Near-field Probe

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency Range: 10MHz — 6.0GHz(EX3DV4)
10MHz — 4GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity: ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
DynamicRange: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application:SAR Dosimetry Testing
Compliance tests ofmobile phones
Dosimetry in strong gradient fields

Picture C.3E-field Probe

C.3 E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4 Other Test Equipment

C.4.1 Data Acquisition Electronics(DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

PictureC.4: DAE

C.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90XL; DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5DASY 4

Picture C.6DASY 5

C.4.3 Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (dasy4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128MB), RAM (DASY4: 64 MB, DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture C.7 Server for DASY 4

Picture C.8 Server for DASY 5

C.4.4 Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

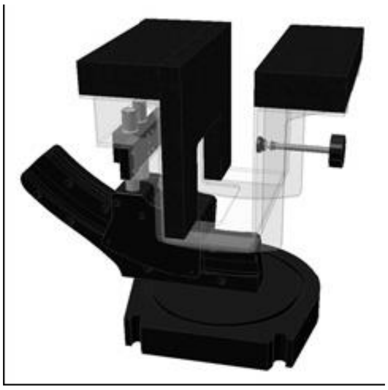
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

Picture C.9-1: Device Holder



Picture C.9-2: Laptop Extension Kit

C.4.5 Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to

Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

Shell Thickness: 2±0. 2 mm

Filling Volume: Approx. 25 liters

Dimensions: 810 x l000 x 500 mm (H x L x W)

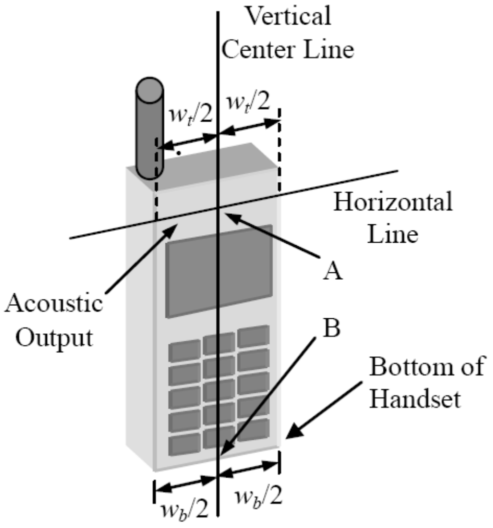
Available: Special

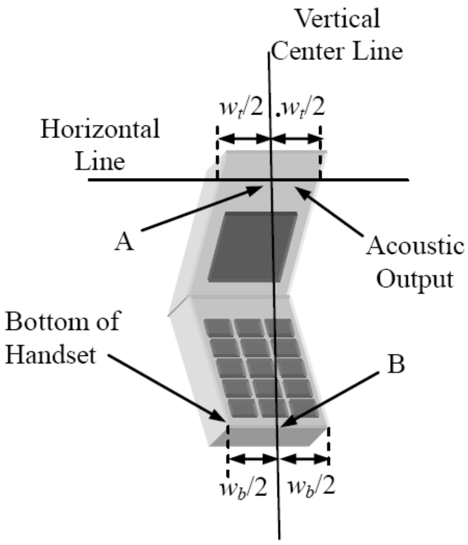
Picture C.10: SAM Twin Phantom

ANNEX D Position of the wireless device in relation to the phantom

D.1 General considerations

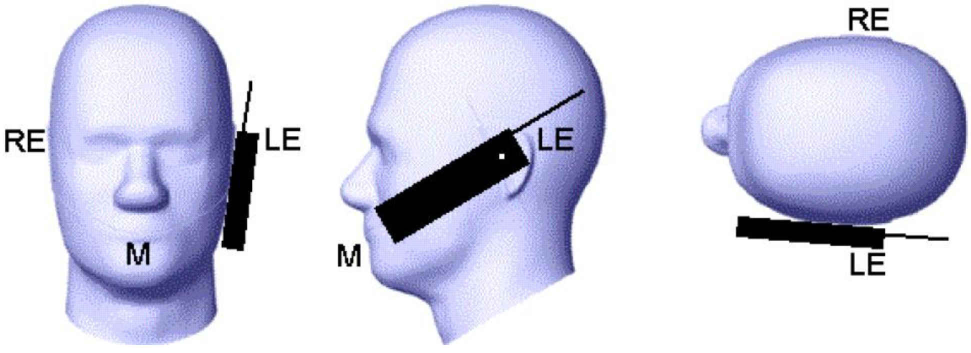
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.



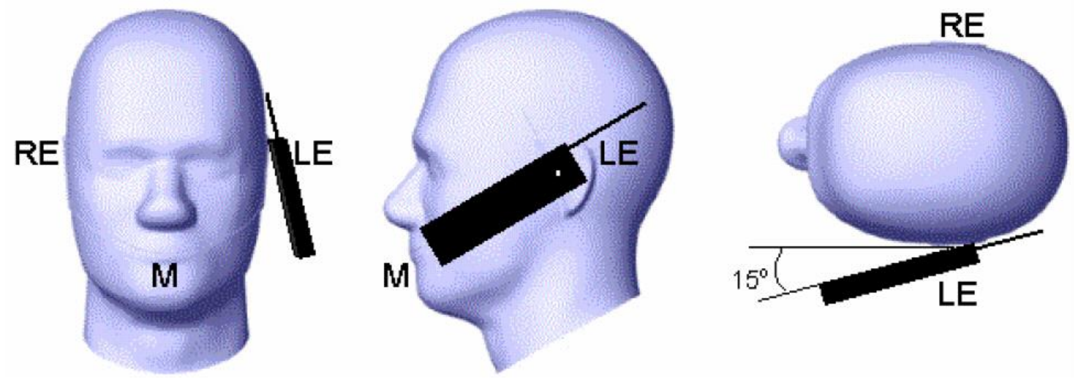


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Picture D.1-a Typical “fixed” case handset   Picture D.1-b Typical “clam-shell” case handset



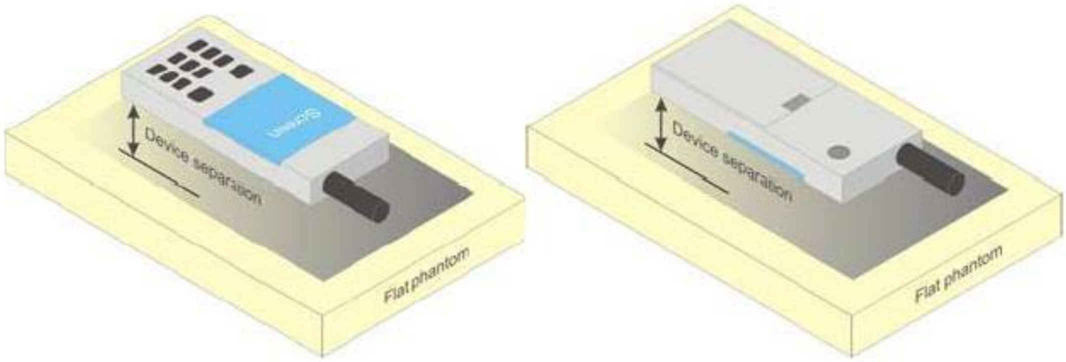
Picture D.2 Cheek position of the wireless device on the left side of SAM



Picture D.3 Tilt position of the wireless device on the left side of SAM

D.2 Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.

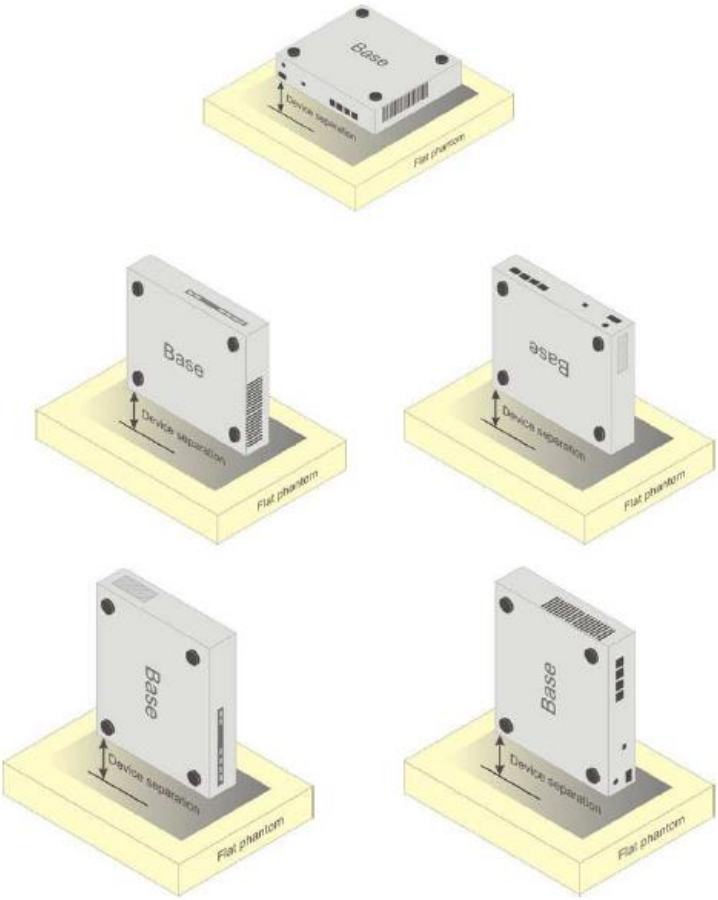


Picture D.4Test positions for body-worn devices

D.3 Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.



Picture D.5 Test positions for desktop devices

D.4 DUT Setup Photos

Picture D.6

ANNEX E Equivalent Media Recipes

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

TableE.1: Composition of the Tissue Equivalent Matter

Frequency (MHz)	835Head	835Body	1900 Head	1900 Body	2450 Head	2450 Body	5800 Head	5800 Body
Ingredients (% by weight)								
Water	41.45	52.5	55.242	69.91	58.79	72.60	65.53	65.53
Sugar	56.0	45.0	\	\	\	\	\	\
Salt	1.45	1.4	0.306	0.13	0.06	0.18	\	\
Preventol	0.1	0.1	\	\	\	\	\	\
Cellulose	1.0	1.0	\	\	\	\	\	\
Glycol Monobutyl	\	\	44.452	29.96	41.15	27.22	\	\
Diethylenglycol monohexylether	\	\	\	\	\	\	17.24	17.24
Triton X-100	\	\	\	\	\	\	17.24	17.24
Dielectric Parameters Target Value	ε=41.5 σ=0.90	ε=55.2 σ=0.97	ε=40.0 σ=1.40	ε=53.3 σ=1.52	ε=39.2 σ=1.80	ε=52.7 σ=1.95	ε=35.3 σ=5.27	ε=48.2 σ=6.00

Note: There are a little adjustment respectively for 750, 1750, 2600, 5200, 5300 and 5600 based on the recipe of closest frequency in table E.1.

ANNEX F System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

Table F.1: System Validation for 7548

Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
7548	Head 750MHz	July.8,2021	750 MHz	OK
7548	Head 900MHz	July.8,2021	900 MHz	OK
7548	Head 1450MHz	July.8,2021	1450 MHz	OK
7548	Head 1750MHz	July.8,2021	1750 MHz	OK
7548	Head 1900MHz	July.9,2021	1900 MHz	OK
7548	Head 2000MHz	July.9,2021	2000 MHz	OK
7548	Head 2300MHz	July.9,2021	2300 MHz	OK
7548	Head 2450MHz	July.9,2021	2450 MHz	OK
7548	Head 2600MHz	July.9,2021	2600 MHz	OK
7548	Head 3300MHz	July.10,2021	3300 MHz	OK
7548	Head 3500MHz	July.10,2021	3500 MHz	OK
7548	Head 3700MHz	July.10,2021	3700 MHz	OK
7548	Head 5250MHz	July.10,2021	5250 MHz	OK
7548	Head 5600MHz	July.10,2021	5600 MHz	OK
7548	Head 5750MHz	July.10,2021	5750 MHz	OK

ANNEX G Probe Calibration Certificate

Probe 7548 Calibration Certificate

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CNAS L0570

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Client CTTL

Certificate No: Z21-60231

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN : 7548

Calibration Procedure(s): FF-Z11-004-02
Calibration Procedures for Dosimetric E-field Probes

Calibration date: June 25, 2021

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101547	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101548	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Reference 10dBAttenuator	18N50W-10dB	10-Feb-20(CTTL, No.J20X00525)	Feb-22
Reference 20dBAttenuator	18N50W-20dB	10-Feb-20(CTTL, No.J20X00526)	Feb-22
Reference Probe EX3DV4	SN 3617	27-Jan-21(SPEAG, No.EX3-3617_Jan21)	Jan-22
DAE4	SN 1556	15-Jan-21(SPEAG, No.DAE4-1556_Jan21)	Jan-22

Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	16-Jun-21(CTTL, No.J21X04467)	Jun-22
Network Analyzer E5071C	MY46110673	21-Jan-21(CTTL, No.J20X00515)	Jan-22

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: June 27, 2021

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

