



SAR TEST REPORT

No. I15Z42353-SEM01

For

TCL Communication Ltd.

Go Flip

Model Name: 4043S

With

Hardware Version: PIO1

Software Version: 4F25

FCC ID: 2ACCJA007

Issued Date: 2015-12-16



Note:

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

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REPORT HISTORY

| Report Number | Revision | Issue Date | Description |
|----------------------|-----------------|-------------------|---------------------------------|
| I15Z42353-SEM01 | Rev.0 | 2015-12-16 | Initial creation of test report |

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1 Test Laboratory

1.1 Testing Location

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

1.2 Testing Environment

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

1.3 Project Data

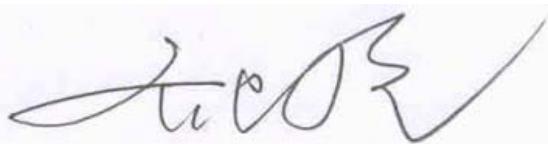
| | |
|---------------------|-------------------|
| Project Leader: | Qi Dianyuan |
| Test Engineer: | Lin Xiaojun |
| Testing Start Date: | October 17, 2015 |
| Testing End Date: | December 14, 2015 |

1.4 Signature



Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results found during testing for TCL Communication Ltd. Go Flip 4043S are as follows:

Table 2.1: Highest Reported SAR (1g)

| Exposure Configuration | Technology Band | Highest Reported SAR 1g (W/Kg) | Equipment Class |
|---|-----------------|--------------------------------|-----------------|
| Head (Separation Distance 0mm) | CDMA BC0 | 0.59 | PCE |
| | CDMA BC1 | 0.51 | |
| | LTE Band 4 | 0.28 | |
| | LTE Band 13 | 0.30 | DTS |
| | WLAN 2.4 GHz | 0.41 | |
| Body-worn (Separation Distance 15mm) | CDMA BC0 | 1.04 | PCE |
| | CDMA BC1 | 0.66 | |
| | LTE Band 4 | 1.24 | |
| | LTE Band 13 | 0.95 | DTS |
| | WLAN 2.4 GHz | 0.08 | |

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

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 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: **1.24 W/kg (1g)**.

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

| | Position | Main antenna | WiFi | Sum |
|--|-------------------------|--------------|------|-------------|
| Highest reported SAR value for Head | Right hand, Touch cheek | 0.59 | 0.41 | 1.00 |
| Highest reported SAR value for Body | Rear open | 1.24 | 0.06 | 1.30 |
| | Rear closed | 1.04 | 0.08 | 1.12 |

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

| | Position | Main antenna | BT* | Sum |
|--|-------------------------|--------------|------|-------------|
| Highest reported SAR value for Head | Right hand, Touch cheek | 0.59 | 0.27 | 0.86 |
| Highest reported SAR value for Body | Rear open | 1.24 | 0.13 | 1.37 |

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

According to the above tables, the highest sum of reported SAR values is **1.37 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.



3 Client Information

3.1 Applicant Information

| | |
|----------------|--|
| Company Name: | TCL Communication Ltd. |
| Address /Post: | 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
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3.2 Manufacturer Information

| | |
|----------------|--|
| Company Name: | TCL Communication Ltd. |
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| Postal Code: | 201203 |
| Country: | P.R.China |
| Contact: | Gong Zhizhou |
| Email: | zhizhou.gong@tcl.com |
| Telephone: | 0086-21-51798260 |
| Fax: | 0086-21-61460602 |

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

4.1 About EUT

| | |
|-------------------------------------|------------------------------------|
| Description: | Go Flip |
| Model Name: | 4043S |
| Operating mode(s): | CDMA BC0/1, LTE Band4/13, BT, WLAN |
| Tested Tx Frequency: | 824.7 – 848.31 MHz (CDMA BC0) |
| | 1851.25 – 1908.75 MHz (CDMA BC1) |
| | 779.5 – 784.5 MHz (LTE Band13) |
| | 1710.7 – 1754.3 MHz (LTE Band4) |
| | 2412 – 2462 MHz (Wi-Fi 2.4G) |
| Test device Production information: | Production unit |
| Device type: | Portable device |
| Antenna type: | Integrated antenna |

4.2 Internal Identification of EUT used during the test

| EUT ID* | IMEI | HW Version | SW Version |
|---------|-----------------|------------|------------|
| EUT1 | 353462070027862 | PIO1 | 4F25 |
| EUT2 | 353462070027706 | PIO1 | 4F25 |
| EUT3 | 353462070027870 | PIO1 | 4F25 |
| EUT4 | 353462070027698 | PIO1 | 4F25 |
| EUT5 | 353462070027664 | PIO1 | 4F25 |

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

Note: It is performed to test SAR with the EUT1&2&4 and conducted power with the EUT 3&5.

4.3 Internal Identification of AE used during the test

| AE ID* | Description | Model | SN | Manufacturer |
|--------|-------------|--------------|----|--------------|
| AE1 | Battery | CAB1780000C2 | / | SCUD |
| AE2 | Headset | CCB3001A15C2 | / | Fly |

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

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

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

5.2 Applicable Measurement Standards

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

KDB447498 D01: General RF Exposure Guidance v05r02: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB648474 D04 Handset SAR v01r02: SAR Evaluation Considerations for Wireless Handsets.

KDB941225 D01 SAR test for 3G devices v03: SAR Measurement Procedures for 3G Devices.

KDB941225 D05 SAR for LTE Devices v02r03: SAR Evaluation Considerations for LTE Devices

KDB248227 D01 802.11 Wi-Fi SAR v02: SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS

KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03: SAR Measurement Requirements for 100 MHz to 6 GHz.

KDB 865664 D02 RF Exposure Reporting v01r01: RF Exposure Compliance Reporting and Documentation Considerations

6 Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

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

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

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

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

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

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

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

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

Table 7.1: Targets for tissue simulating liquid

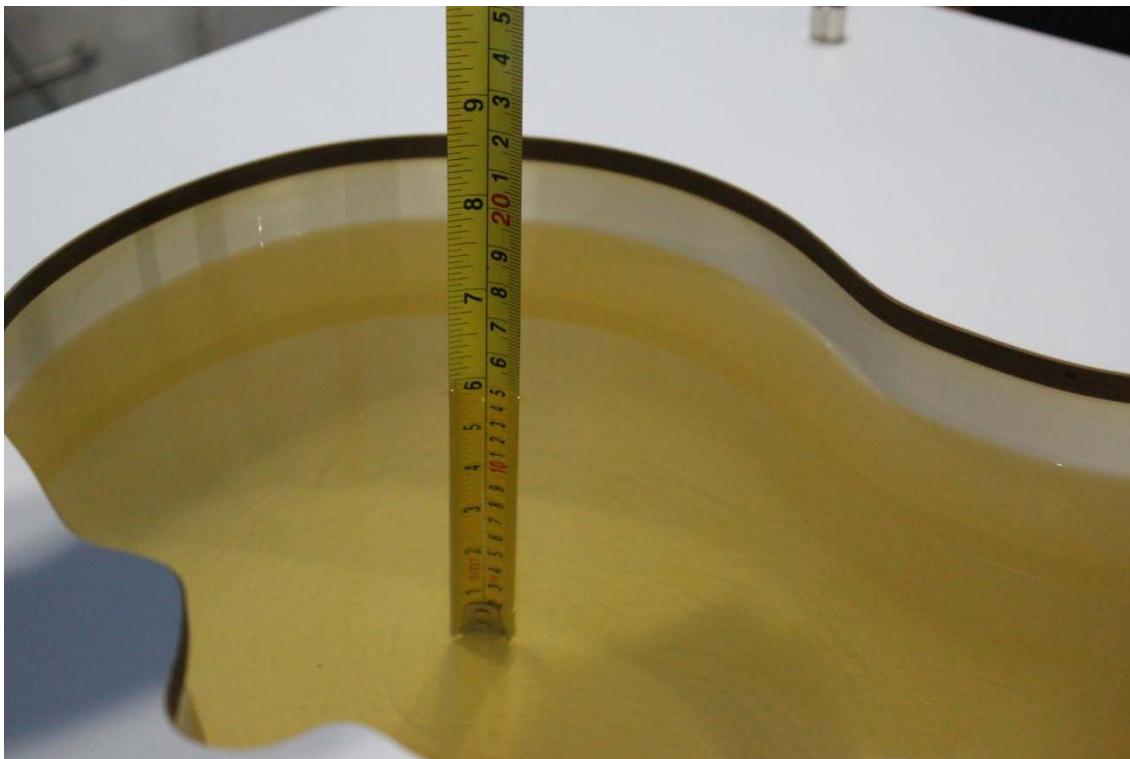
| Frequency (MHz) | Liquid Type | Conductivity (σ) | \pm 5% Range | Permittivity (ϵ) | \pm 5% Range |
|--------------------|-------------|------------------------------|----------------|--------------------------------|----------------|
| 750 | Head | 0.89 | 0.85~0.93 | 41.94 | 39.8~44.0 |
| 750 | Body | 0.96 | 0.91~1.01 | 55.5 | 52.7~58.3 |
| 835 | Head | 0.90 | 0.86~0.95 | 41.5 | 39.4~43.6 |
| 835 | Body | 0.97 | 0.92~1.02 | 55.2 | 52.4~58.0 |
| 1750 | Head | 1.37 | 1.30~1.44 | 40.08 | 38.1~42.1 |
| 1750 | Body | 1.49 | 1.42~1.56 | 53.4 | 50.7~56.1 |
| 1900 | Head | 1.40 | 1.33~1.47 | 40.0 | 38.0~42.0 |
| 1900 | Body | 1.52 | 1.44~1.60 | 53.3 | 50.6~56.0 |
| 2450 | Head | 1.80 | 1.71~1.89 | 39.2 | 37.2~41.2 |
| 2450 | Body | 1.95 | 1.85~2.05 | 52.7 | 50.1~55.3 |

7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

| Measurement Date (yyyy-mm-dd) | Type | Frequency | Permittivity ϵ | Drift (%) | Conductivity σ (S/m) | Drift (%) |
|----------------------------------|------|-----------|----------------------------|--------------|--------------------------------|--------------|
| 2015-10-17 | Head | 750 MHz | 43.08 | 2.72 | 0.912 | 2.47 |
| | Body | 750 MHz | 56.98 | 2.67 | 0.946 | -1.46 |
| 2015-11-04 | Head | 835 MHz | 41.12 | -0.92 | 0.921 | 2.33 |
| | Body | 835 MHz | 56.23 | 1.87 | 0.972 | 0.21 |
| 2015-10-19 | Head | 1750 MHz | 39.53 | -1.37 | 1.331 | -2.85 |
| | Body | 1750 MHz | 52.7 | -1.31 | 1.472 | -1.21 |
| 2015-11-05 | Head | 1900 MHz | 40.54 | 1.35 | 1.408 | 0.57 |
| | Body | 1900 MHz | 52.93 | -0.69 | 1.557 | 2.43 |
| 2015-12-14 | Head | 2450 MHz | 38.38 | -2.09 | 1.827 | 1.50 |
| | Body | 2450 MHz | 53.45 | 1.42 | 1.941 | -0.46 |

Note: The liquid temperature is 22.0 °C



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



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



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



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



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



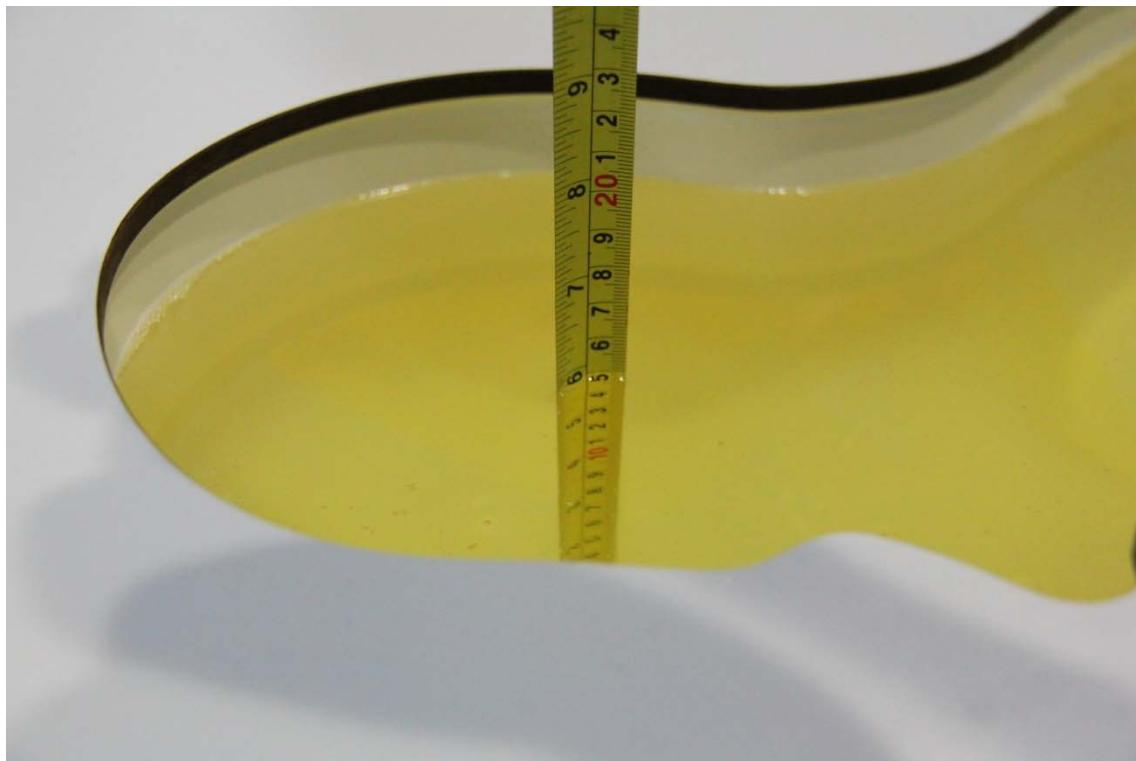
Picture 7-6 Liquid depth in the Flat Phantom (1750MHz)



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



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



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

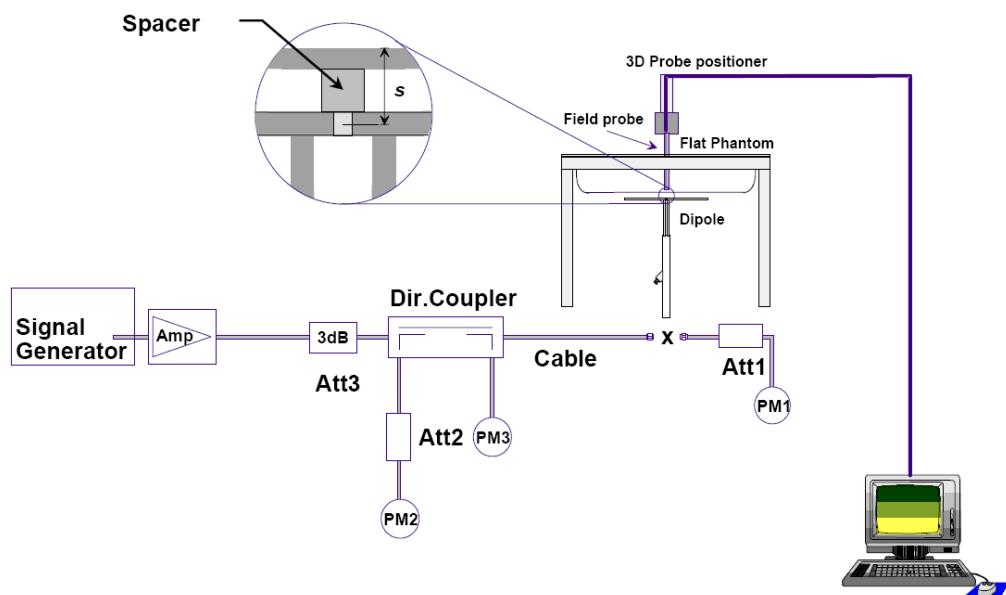


Picture 7-10 Liquid depth in the Flat Phantom (2450MHz)

8 System verification

8.1 System Setup

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



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

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

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

Table 8.1: System Verification of Head

| Measurement Date (yyyy-mm-dd) | Frequency | Target value (W/kg) | | Measured value (W/kg) | | Deviation | |
|----------------------------------|-----------|---------------------|-------------|-----------------------|-------------|--------------|-------------|
| | | 10 g Average | 1 g Average | 10 g Average | 1 g Average | 10 g Average | 1 g Average |
| 2015-10-17 | 750 MHz | 5.36 | 8.2 | 5.40 | 8.28 | 0.75% | 0.98% |
| 2015-11-04 | 835 MHz | 5.92 | 9.12 | 5.96 | 9.08 | 0.68% | -0.44% |
| 2015-10-19 | 1750 MHz | 20.04 | 37.4 | 19.28 | 36.40 | -3.79% | -2.67% |
| 2015-11-05 | 1900 MHz | 21.36 | 40.4 | 21.44 | 40.80 | 0.37% | 0.99% |
| 2015-12-14 | 2450 MHz | 24.5 | 52.5 | 24.24 | 52.40 | -1.06% | -0.19% |

Table 8.2: System Verification of Body

| Measurement Date (yyyy-mm-dd) | Frequency | Target value (W/kg) | | Measured value (W/kg) | | Deviation | |
|----------------------------------|-----------|---------------------|-------------|-----------------------|-------------|--------------|-------------|
| | | 10 g Average | 1 g Average | 10 g Average | 1 g Average | 10 g Average | 1 g Average |
| 2015-10-17 | 750 MHz | 5.68 | 8.64 | 5.80 | 8.84 | 2.11% | 2.31% |
| 2015-11-04 | 835 MHz | 6.24 | 9.52 | 6.24 | 9.56 | 0.00% | 0.42% |
| 2015-10-19 | 1750 MHz | 20.28 | 37.48 | 20.20 | 37.68 | -0.39% | 0.53% |
| 2015-11-05 | 1900 MHz | 21.88 | 40.8 | 21.44 | 41.20 | -2.01% | 0.98% |
| 2015-12-14 | 2450 MHz | 24.4 | 52.1 | 23.96 | 50.00 | -1.80% | -4.03% |

9 Measurement Procedures

9.1 Tests to be performed

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

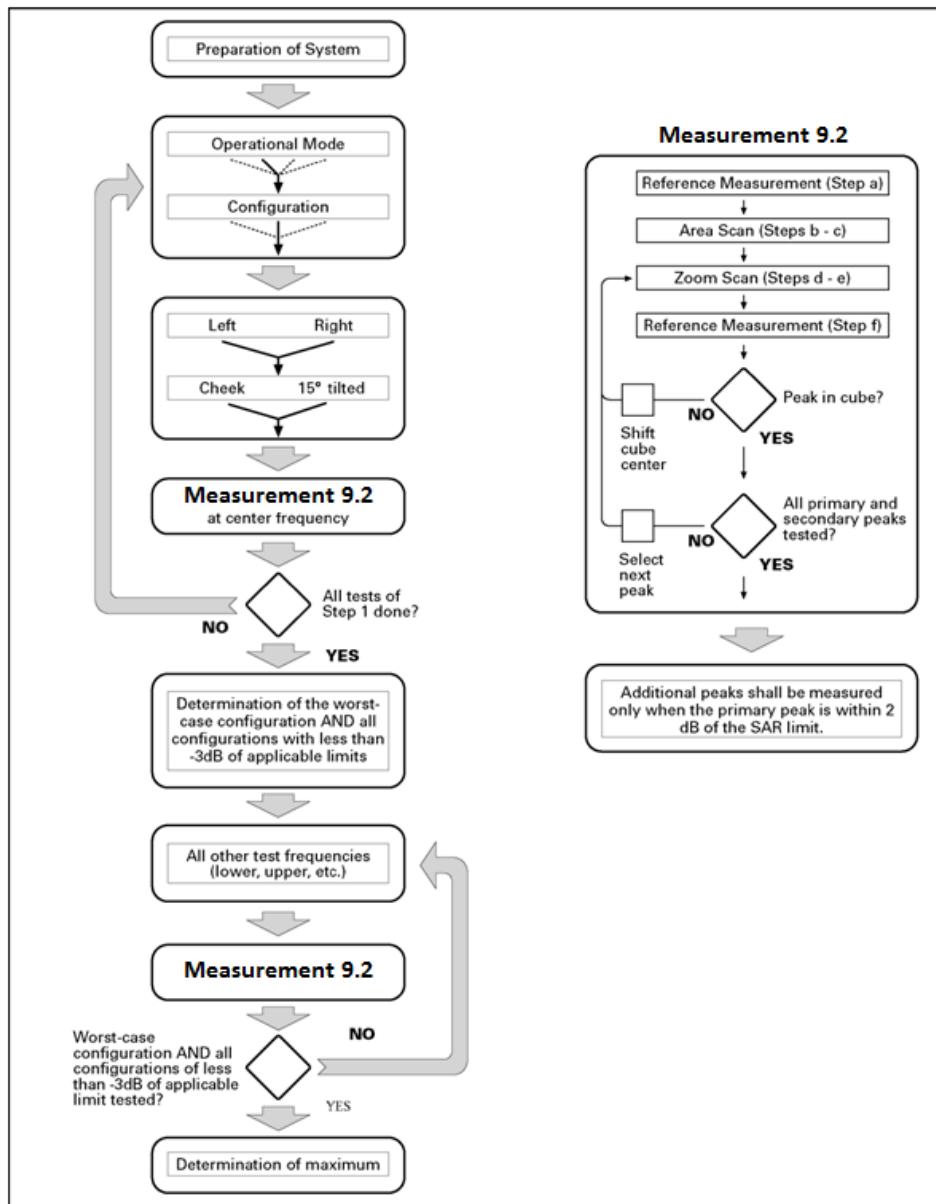
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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

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

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

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



Picture 9.1 Block diagram of the tests to be performed

9.2 General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2003. The results should be documented as part of the system validation records and may be requested to support test results

when all the measurement parameters in the following table are not satisfied.

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

9.3 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.

9.4 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 14.1 to Table 14.16 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10 Area Scan Based 1-g SAR

10.1 Requirement of KDB

According to the KDB447498 D01 v05, when the implementation is based the specific polynomial fit algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007) and the estimated 1-g SAR is $\leq 1.2 \text{ W/kg}$, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

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

10.2 Fast SAR Algorithms

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

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

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

Both algorithms are implemented in DASY software.

11 Conducted Output Power

11.1 Manufacturing tolerance

Table 11.1: CDMA

| CDMA BC0 | | | |
|---------------|--------------|-------------|--------------|
| Channel | Channel 777 | Channel 384 | Channel 1013 |
| Target (dBm) | 24 | 24 | 24 |
| Tune-up (dBm) | 25 | 25 | 25 |
| CDMA BC1 | | | |
| Channel | Channel 1175 | Channel 600 | Channel 25 |
| Target (dBm) | 24 | 24 | 24 |
| Tune-up (dBm) | 25 | 25 | 25 |

Table 11.2: LTE

| Mode | Target (dBm) | Tune-up (dBm) |
|-------------|--------------|---------------|
| LTE Band 4 | 22 | 23.3 |
| LTE Band 13 | 23 | 24 |

LTE MPR will follow up 3GPP setting as below:

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

Table 11.3: Bluetooth

| Mode | GFSK | | |
|---------------|------|-----|----|
| Channel | 0 | 39 | 78 |
| Target (dBm) | 6.9 | 7.1 | 7 |
| Tune-up (dBm) | 7.9 | 8.1 | 8 |

Table 11.4: WiFi

| Mode | Target (dBm) | Tune-up(dBm) |
|----------------------------------|--------------|--------------|
| 802.11 b (2.4GHz) | 15 | 16 |
| 802.11 g (2.4GHz) 6Mbps~12Mbps | 12 | 13 |
| 802.11 g (2.4GHz) 18Mbps | 11.5 | 12.5 |
| 802.11 g (2.4GHz) 24Mbps | 11 | 12 |
| 802.11 g (2.4GHz) 36Mbps | 10.5 | 11.5 |
| 802.11 g (2.4GHz) 48Mbps~54Mbps | 10 | 11 |
| 802.11 n (2.4GHz HT20) MCS0-MCS1 | 12 | 13 |
| 802.11 n (2.4GHz HT20) MCS2-MCS3 | 11.5 | 12.5 |
| 802.11 n (2.4GHz HT20) MCS4 | 11 | 12 |
| 802.11 n (2.4GHz HT20) MCS4 | 11 | 12 |
| 802.11 n (2.4GHz HT40) MCS5-MCS6 | 9.5 | 10.5 |
| 802.11 n (2.4GHz HT40) MCS7 | 9 | 10 |

11.2 CDMA Measurement result

During the process of testing, the EUT was controlled via Agilent Digital Radio Communication tester (E5515C) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

Table 11.5: The conducted power measurement results for CDMA

| CDMA BC0 | Conducted Power (dBm) | | |
|---------------------------------|------------------------------|----------------------------|----------------------------|
| | Channel 777 (848.31MHz) | Channel 384 (836.52MHz) | Channel 1013 (824.7MHz) |
| SO55/RC3 | 24.10 | 24.25 | 24.28 |
| SO55/RC1 | 24.16 | 24.36 | 24.34 |
| SO32/RC3(FCH only) | 24.08 | 24.27 | 24.23 |
| SO32/RC3(FCH+SCH _n) | 24.12 | 24.24 | 24.27 |
| EVDO Rev.0 | 23.67 | 23.95 | 23.99 |
| EVDO Rev.A | 23.68 | 23.80 | 24.00 |
| CDMA BC1 | Conducted Power (dBm) | | |
| | Channel 1175 (1908.75MHz) | Channel 600 (1880MHz) | Channel 25 (1851.25MHz) |
| SO55/RC3 | 24.11 | 24.13 | 24.34 |
| SO55/RC1 | 24.22 | 24.18 | 24.36 |
| SO32/RC3(FCH only) | 24.19 | 24.12 | 24.35 |
| SO32/RC3(FCH+SCH _n) | 24.21 | 24.17 | 24.33 |
| EVDO Rev.0 | 22.55 | 22.61 | 22.98 |
| EVDO Rev.A | 23.17 | 22.79 | 22.66 |

11.3 LTE Measurement result

Table 11.6: The conducted Power for LTE

| Bandwidth (MHz) | RB allocation RB offset (Start RB) | Band 4 | | | | | |
|--------------------|--|--------------------|-------------------------------|------------------------------|-----|------------------------------|-----|
| | | Frequency (MHz) | Max. Target Power (dBm) | QPSK | | 16QAM | |
| | | | | Actual output power (dBm) | MPR | Actual output power (dBm) | MPR |
| 1.4 MHz | 1RB High (5) | 1754.3 | 24 | 22.54 | 0 | 21.89 | 1 |
| | | 1732.5 | 24 | 22.65 | 0 | 21.73 | 1 |
| | | 1710.7 | 24 | 22.47 | 0 | 21.62 | 1 |
| | 1RB Middle (3) | 1754.3 | 24 | 22.60 | 0 | 21.96 | 1 |
| | | 1732.5 | 24 | 22.75 | 0 | 21.97 | 1 |
| | | 1710.7 | 24 | 22.81 | 0 | 21.89 | 1 |
| | 1RB Low (0) | 1754.3 | 24 | 22.41 | 0 | 21.83 | 1 |
| | | 1732.5 | 24 | 22.51 | 0 | 21.65 | 1 |
| | | 1710.7 | 24 | 22.50 | 0 | 21.55 | 1 |
| | 3RB High (3) | 1754.3 | 24 | 22.57 | 0 | 21.71 | 1 |
| | | 1732.5 | 24 | 22.52 | 0 | 21.58 | 1 |
| | | 1710.7 | 24 | 22.45 | 0 | 21.63 | 1 |

| | | | | | | | |
|-------|--------------------|--------|----|-------|---|-------|---|
| 3 MHz | 3RB Middle (1) | 1754.3 | 24 | 22.63 | 0 | 21.73 | 1 |
| | | 1732.5 | 24 | 22.65 | 0 | 21.67 | 1 |
| | | 1710.7 | 24 | 22.70 | 0 | 21.85 | 1 |
| | 3RB Low (0) | 1754.3 | 24 | 22.56 | 0 | 21.51 | 1 |
| | | 1732.5 | 24 | 22.38 | 0 | 21.54 | 1 |
| | | 1710.7 | 24 | 22.64 | 0 | 21.75 | 1 |
| | 6RB (0) | 1754.3 | 24 | 21.65 | 1 | 20.68 | 2 |
| | | 1732.5 | 24 | 21.49 | 1 | 20.51 | 2 |
| | | 1710.7 | 24 | 21.72 | 1 | 20.78 | 2 |
| | 1RB High (14) | 1753.5 | 24 | 22.73 | 0 | 21.95 | 1 |
| | | 1732.5 | 24 | 22.35 | 0 | 21.39 | 1 |
| | | 1711.5 | 24 | 22.42 | 0 | 21.47 | 1 |
| | 1RB Middle (7) | 1753.5 | 24 | 22.34 | 0 | 21.80 | 1 |
| | | 1732.5 | 24 | 22.24 | 0 | 21.24 | 1 |
| | | 1711.5 | 24 | 22.43 | 0 | 21.52 | 1 |
| | 1RB Low (0) | 1753.5 | 24 | 22.38 | 0 | 21.75 | 1 |
| | | 1732.5 | 24 | 22.33 | 0 | 21.38 | 1 |
| | | 1711.5 | 24 | 22.52 | 0 | 21.54 | 1 |
| | 8RB High (7) | 1753.5 | 24 | 21.47 | 1 | 20.64 | 2 |
| | | 1732.5 | 24 | 21.50 | 1 | 20.49 | 2 |
| | | 1711.5 | 24 | 21.67 | 1 | 20.78 | 2 |
| | 8RB Middle (4) | 1753.5 | 24 | 21.37 | 1 | 20.54 | 2 |
| | | 1732.5 | 24 | 21.55 | 1 | 20.59 | 2 |
| | | 1711.5 | 24 | 21.54 | 1 | 20.56 | 2 |
| | 8RB Low (0) | 1753.5 | 24 | 21.42 | 1 | 20.61 | 2 |
| | | 1732.5 | 24 | 21.48 | 1 | 20.48 | 2 |
| | | 1711.5 | 24 | 21.57 | 1 | 20.62 | 2 |
| | 15RB (0) | 1753.5 | 24 | 21.46 | 1 | 20.62 | 2 |
| | | 1732.5 | 24 | 21.51 | 1 | 20.50 | 2 |
| | | 1711.5 | 24 | 21.61 | 1 | 20.73 | 2 |
| 5 MHz | 1RB High (24) | 1752.5 | 24 | 22.76 | 0 | 22.00 | 1 |
| | | 1732.5 | 24 | 22.30 | 0 | 21.61 | 1 |
| | | 1712.5 | 24 | 22.32 | 0 | 21.28 | 1 |
| | 1RB Middle (12) | 1752.5 | 24 | 22.52 | 0 | 21.95 | 1 |
| | | 1732.5 | 24 | 22.22 | 0 | 21.58 | 1 |
| | | 1712.5 | 24 | 22.29 | 0 | 21.26 | 1 |
| | 1RB Low (0) | 1752.5 | 24 | 22.33 | 0 | 21.68 | 1 |
| | | 1732.5 | 24 | 22.37 | 0 | 21.64 | 1 |
| | | 1712.5 | 24 | 22.25 | 0 | 21.24 | 1 |
| | 12RB High (13) | 1752.5 | 24 | 21.49 | 1 | 20.52 | 2 |
| | | 1732.5 | 24 | 21.41 | 1 | 20.46 | 2 |
| | | 1712.5 | 24 | 21.45 | 1 | 20.50 | 2 |

| | | | | | | | |
|--------|---------------------|--------|----|-------|---|-------|---|
| | 12RB Middle (6) | 1752.5 | 24 | 21.43 | 1 | 20.51 | 2 |
| | | 1732.5 | 24 | 21.50 | 1 | 20.64 | 2 |
| | | 1712.5 | 24 | 21.38 | 1 | 20.44 | 2 |
| | 12RB Low (0) | 1752.5 | 24 | 21.42 | 1 | 20.50 | 2 |
| | | 1732.5 | 24 | 21.53 | 1 | 20.66 | 2 |
| | | 1712.5 | 24 | 21.40 | 1 | 20.45 | 2 |
| | 25RB (0) | 1752.5 | 24 | 21.48 | 1 | 20.50 | 2 |
| | | 1732.5 | 24 | 21.52 | 1 | 20.65 | 2 |
| | | 1712.5 | 24 | 21.44 | 1 | 20.48 | 2 |
| 10 MHz | 1RB High (49) | 1750 | 24 | 22.42 | 0 | 21.51 | 1 |
| | | 1732.5 | 24 | 22.38 | 0 | 21.41 | 1 |
| | | 1715 | 24 | 22.23 | 0 | 21.24 | 1 |
| | 1RB Middle (24) | 1750 | 24 | 22.15 | 0 | 21.22 | 1 |
| | | 1732.5 | 24 | 22.57 | 0 | 21.65 | 1 |
| | | 1715 | 24 | 22.62 | 0 | 21.60 | 1 |
| | 1RB Low (0) | 1750 | 24 | 22.60 | 0 | 21.67 | 1 |
| | | 1732.5 | 24 | 22.33 | 0 | 21.32 | 1 |
| | | 1715 | 24 | 22.70 | 0 | 22.00 | 1 |
| | 25RB High (25) | 1750 | 24 | 21.39 | 1 | 20.33 | 2 |
| | | 1732.5 | 24 | 21.53 | 1 | 20.53 | 2 |
| | | 1715 | 24 | 21.35 | 1 | 20.34 | 2 |
| | 25RB Middle (12) | 1750 | 24 | 21.50 | 1 | 20.59 | 2 |
| | | 1732.5 | 24 | 21.56 | 1 | 20.55 | 2 |
| | | 1715 | 24 | 21.40 | 1 | 20.43 | 2 |
| | 25RB Low (0) | 1750 | 24 | 21.43 | 1 | 20.47 | 2 |
| | | 1732.5 | 24 | 21.45 | 1 | 20.49 | 2 |
| | | 1715 | 24 | 21.63 | 1 | 20.73 | 2 |
| | 50RB (0) | 1750 | 24 | 21.46 | 1 | 20.50 | 2 |
| | | 1732.5 | 24 | 21.50 | 1 | 20.54 | 2 |
| | | 1715 | 24 | 21.60 | 1 | 20.67 | 2 |
| 15 MHz | 1RB High (74) | 1747.5 | 24 | 22.42 | 0 | 21.70 | 1 |
| | | 1732.5 | 24 | 22.54 | 0 | 21.66 | 1 |
| | | 1717.5 | 24 | 22.05 | 0 | 21.26 | 1 |
| | 1RB Middle (37) | 1747.5 | 24 | 22.68 | 0 | 21.96 | 1 |
| | | 1732.5 | 24 | 22.21 | 0 | 21.23 | 1 |
| | | 1717.5 | 24 | 22.44 | 0 | 21.47 | 1 |
| | 1RB Low (0) | 1747.5 | 24 | 22.82 | 0 | 22.00 | 1 |
| | | 1732.5 | 24 | 22.33 | 0 | 21.33 | 1 |
| | | 1717.5 | 24 | 22.64 | 0 | 21.76 | 1 |
| | 36RB High (38) | 1747.5 | 24 | 21.32 | 1 | 20.32 | 2 |
| | | 1732.5 | 24 | 21.44 | 1 | 20.54 | 2 |
| | | 1717.5 | 24 | 21.29 | 1 | 20.31 | 2 |
| | 36RB Middle (19) | 1747.5 | 24 | 21.57 | 1 | 20.58 | 2 |
| | | 1732.5 | 24 | 21.39 | 1 | 20.47 | 2 |

| | | | | | | | |
|--------|---------------------|--------|----|-------|---|-------|---|
| 20 MHz | 36RB Low (0) | 1717.5 | 24 | 21.37 | 1 | 20.39 | 2 |
| | | 1747.5 | 24 | 21.75 | 1 | 20.74 | 2 |
| | | 1732.5 | 24 | 21.38 | 1 | 20.42 | 2 |
| | | 1717.5 | 24 | 21.50 | 1 | 20.56 | 2 |
| | 75RB (0) | 1747.5 | 24 | 21.72 | 1 | 20.68 | 2 |
| | | 1732.5 | 24 | 21.40 | 1 | 20.42 | 2 |
| | | 1717.5 | 24 | 21.46 | 1 | 20.43 | 2 |
| | 1RB High (99) | 1745 | 24 | 22.43 | 0 | 21.54 | 1 |
| | | 1732.5 | 24 | 22.81 | 0 | 22.00 | 1 |
| | | 1720 | 24 | 22.29 | 0 | 21.59 | 1 |
| | 1RB Middle (50) | 1745 | 24 | 22.96 | 0 | 21.94 | 1 |
| | | 1732.5 | 24 | 22.30 | 0 | 21.69 | 1 |
| | | 1720 | 24 | 22.28 | 0 | 21.61 | 1 |
| | 1RB Low (0) | 1745 | 24 | 22.90 | 0 | 21.90 | 1 |
| | | 1732.5 | 24 | 22.58 | 0 | 21.95 | 1 |
| | | 1720 | 24 | 22.92 | 0 | 22.00 | 1 |
| | 50RB High (50) | 1745 | 24 | 21.11 | 1 | 20.30 | 2 |
| | | 1732.5 | 24 | 21.45 | 1 | 20.55 | 2 |
| | | 1720 | 24 | 21.28 | 1 | 20.40 | 2 |
| | 50RB Middle (25) | 1745 | 24 | 21.46 | 1 | 20.57 | 2 |
| | | 1732.5 | 24 | 21.35 | 1 | 20.37 | 2 |
| | | 1720 | 24 | 21.15 | 1 | 20.26 | 2 |
| | 50RB Low (0) | 1745 | 24 | 21.64 | 1 | 20.70 | 2 |
| | | 1732.5 | 24 | 21.38 | 1 | 20.42 | 2 |
| | | 1720 | 24 | 21.37 | 1 | 20.44 | 2 |
| | 100RB (0) | 1745 | 24 | 21.61 | 1 | 20.65 | 2 |
| | | 1732.5 | 24 | 21.42 | 1 | 20.44 | 2 |
| | | 1720 | 24 | 21.24 | 1 | 20.30 | 2 |

Band 13

| Bandwidth (MHz) | RB allocation | Frequency (MHz) | Max. Target Power (dBm) | QPSK | | 16QAM | |
|--------------------|--------------------|--------------------|-------------------------------|------------------------------|-----|------------------------------|-----|
| | | | | Actual output power (dBm) | MPR | Actual output power (dBm) | MPR |
| 5 MHz | 1RB High (24) | 784.5 | 24 | 22.97 | 0 | 22.34 | 1 |
| | | 782 | 24 | 23.03 | 0 | 22.27 | 1 |
| | | 779.5 | 24 | 22.99 | 0 | 22.01 | 1 |
| | 1RB Middle (12) | 784.5 | 24 | 23.04 | 0 | 22.36 | 1 |
| | | 782 | 24 | 23.05 | 0 | 22.28 | 1 |
| | | 779.5 | 24 | 23.16 | 0 | 22.29 | 1 |
| | 1RB Low (0) | 784.5 | 24 | 23.18 | 0 | 22.50 | 1 |
| | | 782 | 24 | 23.39 | 0 | 22.56 | 1 |
| | | 779.5 | 24 | 23.55 | 0 | 22.66 | 1 |
| | 12RB High (13) | 784.5 | 24 | 21.98 | 1 | 21.06 | 2 |
| | | 782 | 24 | 22.01 | 1 | 21.25 | 2 |
| | | 779.5 | 24 | 21.96 | 1 | 21.00 | 2 |
| | 12RB Middle (6) | 784.5 | 24 | 22.08 | 1 | 21.15 | 2 |
| | | 782 | 24 | 22.12 | 1 | 21.31 | 2 |
| | | 779.5 | 24 | 22.05 | 1 | 21.10 | 2 |

| | | | | | | | |
|--------|-----------------|-------|----|-------|---|-------|---|
| 10 MHz | 12RB Low (0) | 784.5 | 24 | 22.10 | 1 | 21.17 | 2 |
| | | 782 | 24 | 21.95 | 1 | 21.20 | 2 |
| | | 779.5 | 24 | 22.06 | 1 | 21.24 | 2 |
| | 25RB (0) | 784.5 | 24 | 22.09 | 1 | 21.11 | 2 |
| | | 782 | 24 | 22.11 | 1 | 21.22 | 2 |
| | | 779.5 | 24 | 21.98 | 1 | 21.01 | 2 |
| | 1RB High (49) | 782 | 24 | 22.88 | 0 | 22.12 | 1 |
| | 1RB Middle (24) | 782 | 24 | 23.41 | 0 | 22.45 | 1 |
| | 1RB Low (0) | 782 | 24 | 23.19 | 0 | 22.25 | 1 |
| | 25RB High (25) | 782 | 24 | 21.98 | 1 | 20.92 | 2 |

11.4 Wi-Fi and BT Measurement result

The output power of BT antenna is as following:

| Mode | Conducted Power (dBm) | | |
|------|-----------------------|----------------------|----------------------|
| | Channel 0 (2402MHz) | Channel 39 (2441MHz) | Channel 78 (2480MHz) |
| GFSK | 6.90 | 7.12 | 7.00 |

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

802.11b (dBm)

| Channel\data rate | 1Mbps | 2Mbps | 5.5Mbps | 11Mbps |
|-------------------|-------|-------|---------|--------|
| 1 | 14.32 | \ | 14.42 | \ |
| 6 | 15.47 | \ | 15.62 | \ |
| 11 | 15.64 | 15.79 | 15.88 | 15.56 |

802.11g (dBm)

| Channel\data rate | 6Mbps | 9Mbps | 12Mbps | 18Mbps | 24Mbps | 36Mbps | 48Mbps | 54Mbps |
|-------------------|-------|-------|--------|--------|--------|--------|--------|--------|
| 1 | 11.53 | \ | \ | \ | \ | \ | \ | \ |
| 6 | 12.61 | \ | \ | \ | \ | \ | \ | \ |
| 11 | 12.77 | 12.36 | 12.11 | 11.74 | 11.36 | 10.79 | 10.29 | 10.11 |

802.11n (dBm) - HT20 (2.4G)

| Channel\data rate | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
|-------------------|-------|-------|-------|-------|-------|-------|-------|------|
| 1 | 11.37 | \ | \ | \ | \ | \ | \ | \ |
| 6 | 12.50 | \ | \ | \ | \ | \ | \ | \ |
| 11 | 12.68 | 12.08 | 11.67 | 11.31 | 10.76 | 10.33 | 10.12 | 9.93 |

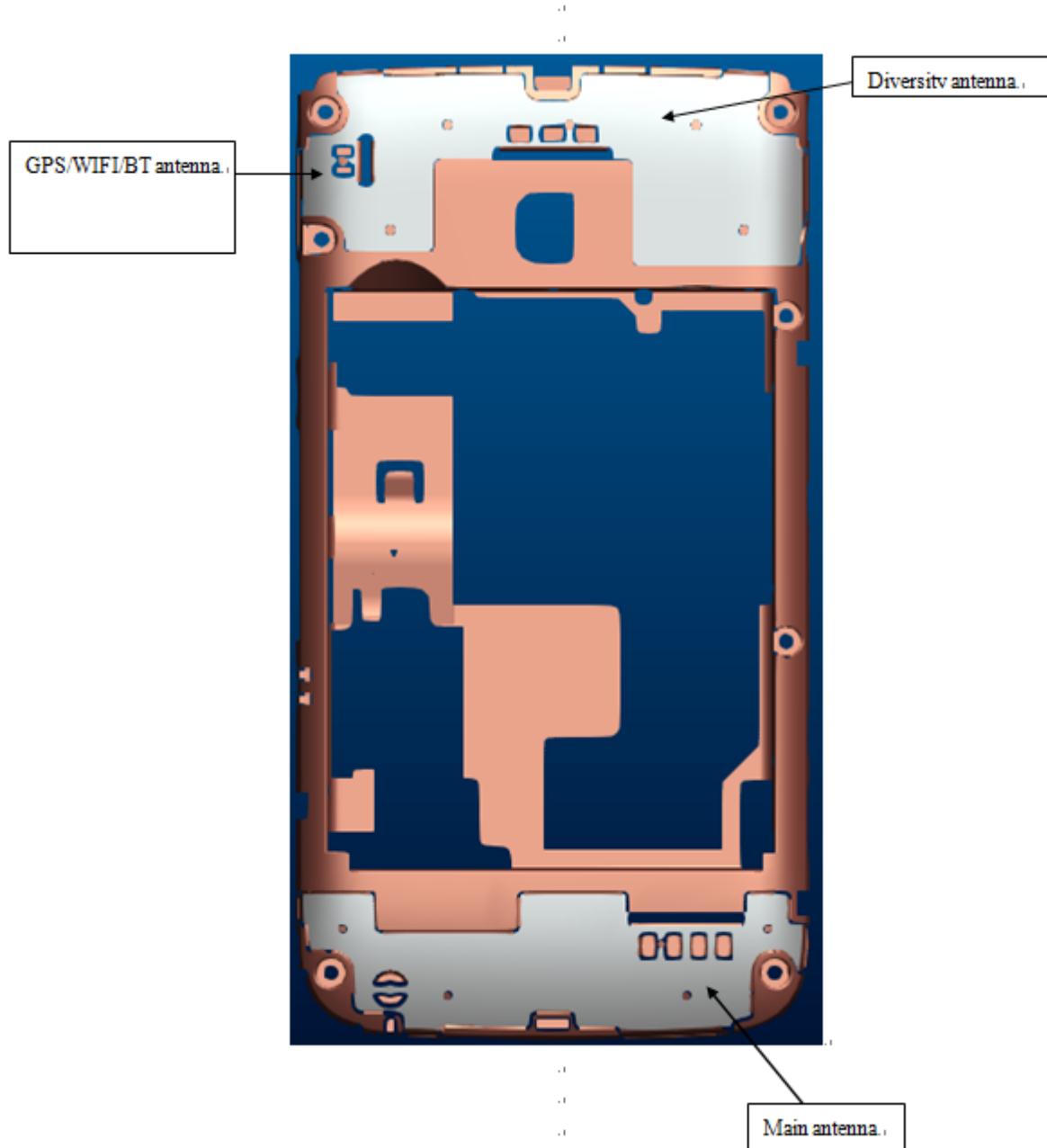
12 Simultaneous TX SAR Considerations

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 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:

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

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

Table 12.1: Standalone SAR test exclusion considerations

| Band/Mode | F(GHz) | Position | SAR test exclusion threshold (mW) | RF output power | | SAR test exclusion |
|---------------------|--------|----------|-----------------------------------|-----------------|-------|--------------------|
| | | | | dBm | mW | |
| Bluetooth | 2.441 | Head | 9.60 | 8.1 | 6.46 | Yes |
| | | Body | 19.20 | 8.1 | 6.46 | Yes |
| 2.4GHz WLAN 802.11b | 2.45 | Head | 9.58 | 16 | 39.81 | No |
| | | Body | 19.17 | 16 | 39.81 | No |

13 Evaluation of Simultaneous

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

| | Position | Main antenna | WiFi | Sum |
|--|-------------------------|--------------|------|-------------|
| Highest reported SAR value for Head | Right hand, Touch cheek | 0.59 | 0.41 | 1.00 |
| Highest reported SAR value for Body | Rear open | 1.24 | 0.06 | 1.30 |
| | Rear closed | 1.04 | 0.08 | 1.12 |

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

| | Position | Main antenna | BT* | Sum |
|--|-------------------------|--------------|------|-------------|
| Highest reported SAR value for Head | Right hand, Touch cheek | 0.59 | 0.27 | 0.86 |
| Highest reported SAR value for Body | Rear open | 1.24 | 0.13 | 1.37 |

BT* - Estimated SAR for Bluetooth (see the table 13.2)

Table 13.3: Estimated SAR for Bluetooth

| Position | F (GHz) | Distance (mm) | Upper limit of power * | | Estimated _{1g} (W/kg) |
|----------|---------|---------------|------------------------|------|--------------------------------|
| | | | dBm | mW | |
| Head | 2.441 | 5 | 8.1 | 6.46 | 0.27 |
| Body | 2.441 | 10 | 8.1 | 6.46 | 0.13 |

* - Maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)].[$\sqrt{f(\text{GHz})/x}$] W/kg for test separation distances \leq 50 mm;
where $x = 7.5$ for 1-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Conclusion:

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

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.

The distance is 10mm and just applied to the condition of body worn accessory.

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

The calculated SAR is obtained by the following formula:

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

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

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

Duty Cycle

| Mode | Duty Cycle |
|------------|------------|
| CDMA & LTE | 1:1 |

14.1 SAR results for Fast SAR

Table 14.1-1: SAR Values (CDMA BC0 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | |
|------------------------------|------|-------|---------------|-----------------------------|-----------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Side | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 836.52 | 384 | Left | Touch | / | 24.25 | 25 | 0.237 | 0.28 | 0.392 | 0.47 | 0.04 |
| 836.52 | 384 | Left | Tilt | / | 24.25 | 25 | 0.149 | 0.18 | 0.215 | 0.26 | 0.00 |
| 848.31 | 777 | Right | Touch | / | 24.1 | 25 | 0.272 | 0.33 | 0.403 | 0.50 | 0.14 |
| 836.52 | 384 | Right | Touch | / | 24.25 | 25 | 0.327 | 0.39 | 0.493 | 0.59 | -0.17 |
| 824.7 | 1013 | Right | Touch | Fig.1 | 24.28 | 25 | 0.211 | 0.25 | 0.318 | 0.38 | 0.11 |
| 836.52 | 384 | Right | Tilt | / | 24.25 | 25 | 0.108 | 0.13 | 0.156 | 0.19 | -0.10 |

Table 14.1-2: SAR Values (CDMA BC0 - Body)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | |
|------------------------------|------|---------------|------------|-----------------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | |
| 836.52 | 384 | Front closed | / | 24.27 | 25 | 0.227 | 0.27 | 0.324 | 0.38 | -0.05 |
| 848.31 | 777 | Rear closed | / | 24.23 | 25 | 0.429 | 0.51 | 0.619 | 0.74 | 0.12 |
| 836.52 | 384 | Rear closed | / | 24.27 | 25 | 0.552 | 0.65 | 0.804 | 0.95 | 0.03 |
| 824.7 | 1013 | Rear closed | Fig.2 | 24.08 | 25 | 0.617 | 0.76 | 0.843 | 1.04 | 0.09 |
| 836.52 | 384 | Rear open | / | 24.27 | 25 | 0.331 | 0.39 | 0.488 | 0.58 | -0.14 |

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

Table 14.1-3: SAR Values (CDMA BC1 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | |
|------------------------------|------|-------|---------------|-----------------------------|-----------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Side | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 1909.75 | 1175 | Left | Touch | / | 24.11 | 25 | 0.184 | 0.23 | 0.309 | 0.38 | 0.06 |
| 1880 | 600 | Left | Touch | / | 24.13 | 25 | 0.226 | 0.28 | 0.383 | 0.47 | 0.08 |
| 1851.25 | 25 | Left | Touch | Fig.3 | 24.34 | 25 | 0.278 | 0.32 | 0.434 | 0.51 | -0.07 |
| 1880 | 600 | Left | Tilt | / | 24.13 | 25 | 0.0467 | 0.06 | 0.0799 | 0.10 | 0.12 |
| 1880 | 600 | Right | Touch | / | 24.13 | 25 | 0.178 | 0.22 | 0.265 | 0.32 | 0.13 |
| 1880 | 600 | Right | Tilt | / | 24.13 | 25 | 0.0379 | 0.05 | 0.069 | 0.08 | -0.02 |

Table 14.1-4: SAR Values (CDMA BC1 - Body)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | |
|------------------------------|------|---------------|------------|-----------------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | |
| 1880 | 600 | Front closed | / | 24.12 | 25 | 0.0553 | 0.07 | 0.0911 | 0.11 | -0.11 |
| 1909.75 | 1175 | Rear closed | / | 24.19 | 25 | 0.307 | 0.37 | 0.518 | 0.62 | -0.01 |
| 1880 | 600 | Rear closed | Fig.4 | 24.12 | 25 | 0.325 | 0.40 | 0.538 | 0.66 | 0.04 |
| 1851.25 | 25 | Rear closed | / | 24.35 | 25 | 0.271 | 0.31 | 0.463 | 0.54 | 0.06 |
| 1880 | 600 | Rear open | / | 24.12 | 25 | 0.311 | 0.38 | 0.514 | 0.63 | 0.02 |

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

Table 14.1-5: SAR Values (LTE Band4 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °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) |
| MHz | Ch. | | | | | | | | | | | |
| 1745 | 20300 | 1RB_Mid | Left | Touch | Fig.5 | 22.96 | 23.3 | 0.18 | 0.19 | 0.261 | 0.28 | -0.15 |
| 1745 | 20300 | 1RB_Mid | Left | Tilt | / | 22.96 | 23.3 | 0.0835 | 0.09 | 0.145 | 0.16 | -0.04 |
| 1745 | 20300 | 1RB_Mid | Right | Touch | / | 22.96 | 23.3 | 0.143 | 0.15 | 0.249 | 0.27 | 0.07 |
| 1745 | 20300 | 1RB_Mid | Right | Tilt | / | 22.96 | 23.3 | 0.0509 | 0.06 | 0.0845 | 0.09 | 0.06 |
| 1745 | 20300 | 50RB_Low | Left | Touch | / | 21.64 | 22.3 | 0.131 | 0.15 | 0.219 | 0.25 | 0.14 |
| 1745 | 20300 | 50RB_Low | Left | Tilt | / | 21.64 | 22.3 | 0.0763 | 0.09 | 0.131 | 0.15 | 0.03 |
| 1745 | 20300 | 50RB_Low | Right | Touch | / | 21.64 | 22.3 | 0.11 | 0.13 | 0.206 | 0.24 | 0.08 |
| 1745 | 20300 | 50RB_Low | Right | Tilt | / | 21.64 | 22.3 | 0.0469 | 0.05 | 0.0792 | 0.09 | 0.06 |

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-6: SAR Values (LTE Band4 - Body)

| | | Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | |
|-----------|-------|------------------------------|---------------|------------|-----------------------|-----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Mode | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 1745 | 20300 | 1RB_Mid | Front closed | / | 22.96 | 23.3 | 0.0965 | 0.10 | 0.15 | 0.16 | 0.02 |
| 1745 | 20300 | 1RB_Mid | Rear closed | / | 22.96 | 23.3 | 0.327 | 0.35 | 0.541 | 0.59 | -0.09 |
| 1745 | 20300 | 1RB_Mid | Rear open | / | 22.96 | 23.3 | 0.565 | 0.61 | 0.934 | 1.01 | -0.04 |
| 1732.5 | 20175 | 1RB_Mid | Rear open | Fig.6 | 22.96 | 23.3 | 0.722 | 0.78 | 1.15 | 1.24 | 0.03 |
| 1720 | 20050 | 1RB_Mid | Rear open | / | 22.96 | 23.3 | 0.522 | 0.56 | 0.869 | 0.94 | -0.06 |
| 1745 | 20300 | 50RB_Low | Front closed | / | 21.64 | 22.3 | 0.0904 | 0.11 | 0.141 | 0.16 | -0.10 |
| 1745 | 20300 | 50RB_Low | Rear closed | / | 21.64 | 22.3 | 0.319 | 0.37 | 0.529 | 0.62 | 0.02 |
| 1745 | 20300 | 50RB_Low | Rear open | / | 21.64 | 22.3 | 0.554 | 0.64 | 0.918 | 1.07 | -0.15 |
| 1732.5 | 20175 | 50RB_Low | Rear open | / | 21.64 | 22.3 | 0.459 | 0.53 | 0.763 | 0.89 | 0.02 |
| 1720 | 20050 | 50RB_Low | Rear open | / | 21.64 | 22.3 | 0.394 | 0.46 | 0.654 | 0.76 | 0.07 |
| 1745 | 20300 | 100RB | Rear closed | / | 21.61 | 22.3 | 0.44 | 0.52 | 0.726 | 0.85 | -0.02 |

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

Note2: The LTE mode is QPSK_20MHz.

Table 14.1-7: SAR Values (LTE Band13 - Head)

| | | Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °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) |
| MHz | Ch. | | | | | | | | | | | |
| 782 | 23230 | 1RB_Mid | Left | Touch | / | 23.41 | 24 | 0.137 | 0.16 | 0.215 | 0.25 | 0.13 |
| 782 | 23230 | 1RB_Mid | Left | Tilt | / | 23.41 | 24 | 0.0577 | 0.07 | 0.0819 | 0.09 | 0.00 |
| 782 | 23230 | 1RB_Mid | Right | Touch | Fig.7 | 23.41 | 24 | 0.179 | 0.21 | 0.26 | 0.30 | 0.14 |
| 782 | 23230 | 1RB_Mid | Right | Tilt | / | 23.41 | 24 | 0.0581 | 0.07 | 0.0831 | 0.10 | -0.03 |
| 782 | 23230 | 25RB_Mid | Left | Touch | / | 22.15 | 23 | 0.111 | 0.13 | 0.175 | 0.21 | 0.10 |
| 782 | 23230 | 25RB_Mid | Left | Tilt | / | 22.15 | 23 | 0.047 | 0.06 | 0.0669 | 0.08 | 0.04 |
| 782 | 23230 | 25RB_Mid | Right | Touch | / | 22.15 | 23 | 0.138 | 0.17 | 0.211 | 0.26 | -0.01 |
| 782 | 23230 | 25RB_Mid | Right | Tilt | / | 22.15 | 23 | 0.0472 | 0.06 | 0.0677 | 0.08 | -0.11 |

Note1: The LTE mode is QPSK_10MHz.

Table 14.1-8: SAR Values (LTE Band13 - Body)

| | | Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | |
|-----------|-------|------------------------------|---------------|------------|-----------------------|-----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|--|
| Frequency | | Mode | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) | |
| MHz | Ch. | | | | | | | | | | | |
| 782 | 23230 | 1RB_Mid | Front closed | / | 23.41 | 24 | 0.172 | 0.20 | 0.24 | 0.27 | -0.07 | |
| 782 | 23230 | 1RB_Mid | Rear closed | Fig.8 | 23.41 | 24 | 0.577 | 0.66 | 0.832 | 0.95 | 0.02 | |
| 782 | 23230 | 1RB_Mid | Rear open | / | 23.41 | 24 | 0.441 | 0.51 | 0.623 | 0.71 | -0.02 | |

| | | | | | | | | | | | |
|-----|-------|----------|--------------|---|-------|----|-------|-------------|-------|-------------|-------|
| 782 | 23230 | 25RB_Mid | Front closed | / | 22.15 | 23 | 0.128 | 0.16 | 0.179 | 0.22 | -0.02 |
| 782 | 23230 | 25RB_Mid | Rear closed | / | 22.15 | 23 | 0.443 | 0.54 | 0.635 | 0.77 | -0.10 |
| 782 | 23230 | 25RB_Mid | Rear open | / | 22.15 | 23 | 0.354 | 0.43 | 0.5 | 0.61 | 0.05 |
| 782 | 23230 | 50RB | Rear closed | / | 22.06 | 23 | 0.397 | 0.49 | 0.566 | 0.70 | -0.14 |

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

Note2: The LTE mode is QPSK_10MHz.

14.2 SAR results for Standard procedure

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

Table 14.2-1: SAR Values (CDMA BC0 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | |
|------------------------------|-----|-------|---------------|-----------------------------|-----------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Side | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 836.52 | 384 | Right | Touch | / | 24.25 | 25 | 0.327 | 0.39 | 0.493 | 0.59 | -0.17 |

Table 14.2-2: SAR Values (CDMA BC0 - Body)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | |
|------------------------------|------|---------------|------------|-----------------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | |
| 824.7 | 1013 | Rear closed | Fig.2 | 24.08 | 25 | 0.617 | 0.76 | 0.843 | 1.04 | 0.09 |

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

Table 14.2-3: SAR Values (CDMA BC1 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | |
|------------------------------|-----|------|---------------|-----------------------------|-----------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Side | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 1851.25 | 25 | Left | Touch | Fig.3 | 24.34 | 25 | 0.278 | 0.32 | 0.434 | 0.51 | -0.07 |

Table 14.2-4: SAR Values (CDMA BC1 - Body)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | |
|------------------------------|-----|---------------|------------|-----------------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|--|
| Frequency | | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) | |
| MHz | Ch. | | | | | | | | | | |
| 1880 | 600 | Rear closed | Fig.4 | 24.12 | 25 | 0.325 | 0.40 | 0.538 | 0.66 | 0.04 | |

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

Table 14.2-5: SAR Values (LTE Band4 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °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) |
| MHz | Ch. | | | | | | | | | | | |
| 1745 | 20300 | 1RB_Mid | Left | Touch | Fig.5 | 22.96 | 23.3 | 0.18 | 0.19 | 0.261 | 0.28 | -0.15 |

Table 14.2-6: SAR Values (LTE Band4 - Body)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | | |
|------------------------------|-------|---------|---------------|-----------------------------|-----------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|--|
| Frequency | | Mode | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) | |
| MHz | Ch. | | | | | | | | | | | |
| 1732.5 | 20175 | 1RB_Mid | Rear open | Fig.6 | 22.96 | 23.3 | 0.722 | 0.78 | 1.15 | 1.24 | 0.03 | |

Table 14.2-7: SAR Values (LTE Band13 - Head)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °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) |
| MHz | Ch. | | | | | | | | | | | |
| 782 | 23230 | 1RB_Mid | Right | Touch | Fig.7 | 23.41 | 24 | 0.179 | 0.21 | 0.26 | 0.30 | 0.14 |

Note1: The LTE mode is QPSK_10MHz.

Table 14.2-8: SAR Values (LTE Band13 - Body)

| Ambient Temperature: 22.2 °C | | | | Liquid Temperature: 21.7 °C | | | | | | | | |
|------------------------------|-------|---------|---------------|-----------------------------|-----------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|--|
| Frequency | | Mode | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) | |
| MHz | Ch. | | | | | | | | | | | |
| 782 | 23230 | 1RB_Mid | Rear closed | Fig.8 | 23.41 | 24 | 0.577 | 0.66 | 0.832 | 0.95 | 0.02 | |

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

Note2: The LTE mode is QPSK_10MHz.

14.3 WLAN Evaluation

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

Head Evaluation

Table 14.3-1: SAR Values (WLAN - Head) – 802.11b 5.5Mbps (Fast SAR)

| Ambient Temperature: 22.2 °C | | | | | | Liquid Temperature: 21.7 °C | | | | | |
|------------------------------|-----|-------|---------------|------------|-----------------------|-----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Side | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 2462 | 11 | Left | Touch | / | 15.88 | 16 | 0.073 | 0.08 | 0.148 | 0.15 | 0.07 |
| 2462 | 11 | Left | Tilt | / | 15.88 | 16 | 0.00712 | 0.01 | 0.0147 | 0.02 | 0.09 |
| 2462 | 11 | Right | Touch | / | 15.88 | 16 | 0.161 | 0.17 | 0.359 | 0.37 | 0.11 |
| 2462 | 11 | Right | Tilt | / | 15.88 | 16 | 0.00456 | 0.00 | 0.00883 | 0.01 | -0.12 |

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

Table 14.3-2: SAR Values (WLAN - Head) – 802.11b 5.5Mbps (Full SAR)

| Ambient Temperature: 22.2 °C | | | | | | Liquid Temperature: 21.7 °C | | | | | |
|------------------------------|-----|-------|---------------|------------|-----------------------|-----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Side | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | | | | | | | | |
| 2462 | 11 | Right | Touch | Fig.9 | 15.88 | 16 | 0.158 | 0.16 | 0.386 | 0.40 | 0.11 |

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 97.48% is achievable for WLAN in this project and the scaled reported SAR is presented as below:

Table 14.3-3: SAR Values (WLAN - Head) – 802.11b 5.5Mbps (Scaled Reported SAR)

| Ambient Temperature: 22.2 °C | | | | | | Liquid Temperature: 21.7 °C | | | | | |
|------------------------------|-----|-------|---------------|--------------------|---------------------|-----------------------------|---------------------------------|--|--|-------------|--|
| Frequency | | Side | Test Position | Actual duty factor | maximum duty factor | Reported SAR (1g) (W/kg) | Scaled reported SAR (1g) (W/kg) | | | | |
| MHz | Ch. | | | | | | | | | | |
| 2462 | 11 | Right | Touch | 97.48% | 100% | 0.40 | | | | 0.41 | |

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

Body Evaluation
Table 14.3-4: SAR Values (WLAN - Body) – 802.11b 5.5Mbps (Fast SAR)

| | | Ambient Temperature: 22.2 °C | | | Liquid Temperature: 21.7 °C | | | | | |
|-----------|-----|------------------------------|------------|-----------------------|-----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | / | 15.88 | 16 | 0.0104 | 0.01 | 0.0184 | 0.02 |
| 2462 | 11 | Front | / | 15.88 | 16 | 0.0104 | 0.01 | 0.0184 | 0.02 | 0.00 |
| 2462 | 11 | Rear closed | / | 15.88 | 16 | 0.0423 | 0.04 | 0.0761 | 0.08 | 0.10 |
| 2462 | 11 | Rear open | / | 15.88 | 16 | 0.0342 | 0.04 | 0.0598 | 0.06 | 0.12 |

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

Table 14.3-5: SAR Values (WLAN - Body) – 802.11b 5.5Mbps (Full SAR)

| | | Ambient Temperature: 22.2 °C | | | Liquid Temperature: 21.7 °C | | | | | |
|-----------|-----|------------------------------|------------|-----------------------|-----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|------------------|
| Frequency | | Test Position | Figure No. | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(10g) (W/kg) | Reported SAR(10g) (W/kg) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift (dB) |
| MHz | Ch. | | | / | 15.88 | 16 | 0.0428 | 0.04 | 0.0767 | 0.08 |
| 2462 | 11 | Rear closed | Fig.10 | 15.88 | 16 | 0.0428 | 0.04 | 0.0767 | 0.08 | 0.10 |
| 2462 | 11 | Rear open | / | 15.88 | 16 | 0.0342 | 0.04 | 0.0602 | 0.06 | 0.12 |

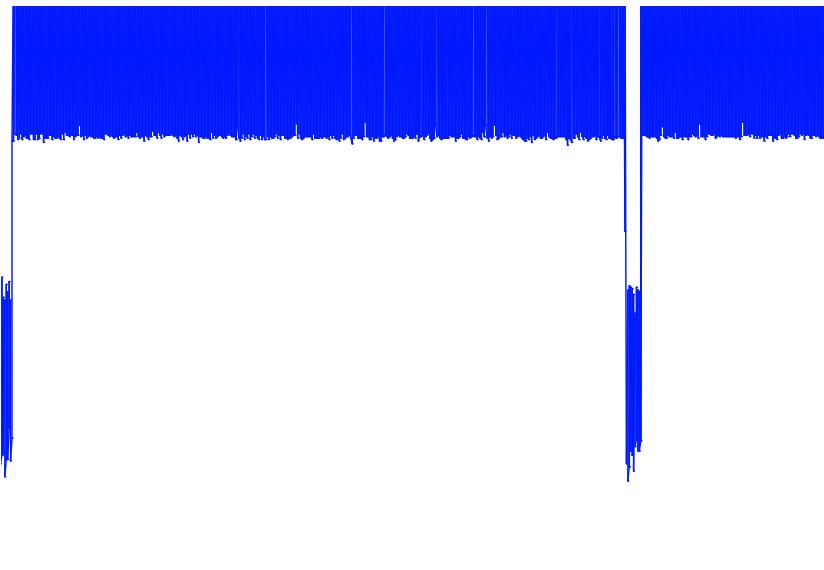
According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 97.48% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

Table 14.3-6: SAR Values (WLAN - Body) – 802.11b 5.5Mbps (Scaled Reported SAR)

| | | Ambient Temperature: 22.2 °C | | | Liquid Temperature: 21.7 °C | | |
|-----------|-----|------------------------------|--------------------|---------------------|-----------------------------|---------------------------------|--|
| Frequency | | Test Position | Actual duty factor | maximum duty factor | Reported SAR (1g) (W/kg) | Scaled reported SAR (1g) (W/kg) | |
| MHz | Ch. | | / | 97.48% | 100% | 0.08 | |
| 2462 | 11 | Rear closed | 97.48% | 100% | 0.08 | 0.08 | |
| 2462 | 11 | Rear open | 97.48% | 100% | 0.06 | 0.06 | |

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

✓



Date: 10.FEB.2003 05:12:13

Picture 14.1 The plot of duty factor

15 SAR Measurement Variability

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

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

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

Table 15.1: SAR Measurement Variability for Body CDMA BC0 (1g)

| Frequency | | Test Position | Spacing (mm) | Original SAR (W/kg) | First Repeated SAR (W/kg) | The Ratio | Second Repeated SAR (W/kg) |
|-----------|------|---------------|--------------|---------------------|---------------------------|-----------|----------------------------|
| MHz | Ch. | | | | | | |
| 824.7 | 1013 | Rear closed | 15 | 0.843 | 0.847 | 1.01 | / |

Table 15.2: SAR Measurement Variability for Body LTE Band4 (1g)

| Frequency | | Test Position | Spacing (mm) | Original SAR (W/kg) | First Repeated SAR (W/kg) | The Ratio | Second Repeated SAR (W/kg) |
|-----------|-------|---------------|--------------|---------------------|---------------------------|-----------|----------------------------|
| MHz | Ch. | | | | | | |
| 1720 | 20175 | Rear open | 15 | 1.15 | 1.15 | 1.00 | / |

Table 15.3: SAR Measurement Variability for Body LTE Band13 (1g)

| Frequency | | Test Position | Spacing (mm) | Original SAR (W/kg) | First Repeated SAR (W/kg) | The Ratio | Second Repeated SAR (W/kg) |
|-----------|-------|---------------|--------------|---------------------|---------------------------|-----------|----------------------------|
| MHz | Ch. | | | | | | |
| 782 | 23230 | Rear closed | 15 | 0.832 | 0.836 | 1.01 | / |

16 Measurement Uncertainty

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

| No. | Error Description | Type | Uncertainty value | Probably Distribution | Div. | (Ci) 1g | (Ci) 10g | Std. Unc. (1g) | Std. Unc. (10g) | Degree of freedom |
|----------------------------|---|------|-------------------|-----------------------|------------|---------|----------|----------------|-----------------|-------------------|
| Measurement system | | | | | | | | | | |
| 1 | Probe calibration | B | 5.5 | N | 1 | 1 | 1 | 5.5 | 5.5 | ∞ |
| 2 | Isotropy | B | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| 3 | Boundary effect | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 4 | Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 5 | Detection limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 6 | Readout electronics | B | 0.3 | R | $\sqrt{3}$ | 1 | 1 | 0.3 | 0.3 | ∞ |
| 7 | Response time | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 8 | Integration time | B | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.5 | 1.5 | ∞ |
| 9 | RF ambient conditions-noise | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 10 | RF ambient conditions-reflection | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 11 | Probe positioned mech. restrictions | B | 0.4 | R | $\sqrt{3}$ | 1 | 1 | 0.2 | 0.2 | ∞ |
| 12 | Probe positioning with respect to phantom shell | B | 2.9 | R | $\sqrt{3}$ | 1 | 1 | 1.7 | 1.7 | ∞ |
| 13 | Post-processing | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 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 | $u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$ | | | | | 9.25 | 9.12 | 257 |
| Expanded uncertainty (confidence interval of 95 %) | $u_e = 2u_c$ | | | | | 18.5 | 18.2 | |

16.2 Measurement Uncertainty for Normal SAR Tests (3~6GHz)

| No. | Error Description | Type | Uncertainty value | Probably Distribution | Div. | (Ci) 1g | (Ci) 10g | Std. Unc. (1g) | Std. Unc. (10g) | Degree of freedom |
|-----|-------------------|------|-------------------|-----------------------|------|------------|-------------|----------------------|-----------------------|-------------------|
|-----|-------------------|------|-------------------|-----------------------|------|------------|-------------|----------------------|-----------------------|-------------------|

Measurement system

| | | | | | | | | | | |
|----|---|---|-----|---|------------|-----|-----|-----|-----|----------|
| 1 | Probe calibration | B | 6.5 | N | 1 | 1 | 1 | 6.5 | 6.5 | ∞ |
| 2 | Isotropy | B | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| 3 | Boundary effect | B | 2.0 | R | $\sqrt{3}$ | 1 | 1 | 1.2 | 1.2 | ∞ |
| 4 | Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 5 | Detection limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 6 | Readout electronics | B | 0.3 | R | $\sqrt{3}$ | 1 | 1 | 0.3 | 0.3 | ∞ |
| 7 | Response time | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 8 | Integration time | B | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.5 | 1.5 | ∞ |
| 9 | RF ambient conditions-noise | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 10 | RF ambient conditions-reflection | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 11 | Probe positioned mech. restrictions | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 12 | Probe positioning with respect to phantom shell | B | 6.7 | R | $\sqrt{3}$ | 1 | 1 | 3.9 | 3.9 | ∞ |
| 13 | Post-processing | B | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.3 | 2.3 | ∞ |

Test sample related

| | | | | | | | | | | |
|----|---------------------------|---|-----|---|------------|---|---|-----|-----|----------|
| 14 | Test sample positioning | A | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 71 |
| 15 | Device holder uncertainty | A | 3.4 | N | 1 | 1 | 1 | 3.4 | 3.4 | 5 |
| 16 | Drift of output power | B | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.9 | 2.9 | ∞ |

Phantom and set-up

| | | | | | | | | | | |
|----|------------------------------|---|------|---|------------|------|------|------|------|----------|
| 17 | Phantom uncertainty | B | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.3 | 2.3 | ∞ |
| 18 | Liquid conductivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| 19 | Liquid conductivity (meas.) | A | 2.06 | N | 1 | 0.64 | 0.43 | 1.32 | 0.89 | 43 |

| | | | | | | | | | | |
|----|--|--|-----|---|------------|-----|------|------|------|----------|
| 20 | Liquid permittivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| 21 | Liquid permittivity (meas.) | A | 1.6 | N | 1 | 0.6 | 0.49 | 1.0 | 0.8 | 521 |
| | Combined standard uncertainty | $u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$ | | | | | | 10.8 | 10.7 | 257 |
| | Expanded uncertainty (confidence interval of 95 %) | $u_e = 2u_c$ | | | | | | 21.6 | 21.4 | |

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

| No. | Error Description | Type | Uncertainty value | Probably Distribution | Div. | (Ci) 1g | (Ci) 10g | Std. Unc. (1g) | Std. Unc. (10g) | Degree of freedo m |
|----------------------------|---|------|-------------------|-----------------------|------------|------------|-------------|----------------------|-----------------------|-----------------------------|
| Measurement system | | | | | | | | | | |
| 1 | Probe calibration | B | 5.5 | N | 1 | 1 | 1 | 5.5 | 5.5 | ∞ |
| 2 | Isotropy | B | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| 3 | Boundary effect | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 4 | Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 5 | Detection limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 6 | Readout electronics | B | 0.3 | R | $\sqrt{3}$ | 1 | 1 | 0.3 | 0.3 | ∞ |
| 7 | Response time | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 8 | Integration time | B | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.5 | 1.5 | ∞ |
| 9 | RF ambient conditions-noise | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 10 | RF ambient conditions-reflection | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 11 | Probe positioned mech. Restrictions | B | 0.4 | R | $\sqrt{3}$ | 1 | 1 | 0.2 | 0.2 | ∞ |
| 12 | Probe positioning with respect to phantom shell | B | 2.9 | R | $\sqrt{3}$ | 1 | 1 | 1.7 | 1.7 | ∞ |
| 13 | Post-processing | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 14 | Fast SAR z-Approximation | B | 7.0 | R | $\sqrt{3}$ | 1 | 1 | 4.0 | 4.0 | ∞ |
| Test sample related | | | | | | | | | | |
| 15 | Test sample positioning | A | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 71 |
| 16 | Device holder uncertainty | A | 3.4 | N | 1 | 1 | 1 | 3.4 | 3.4 | 5 |
| 17 | Drift of output power | B | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.9 | 2.9 | ∞ |

| Phantom and set-up | | | | | | | | | | |
|--|------------------------------|--|------|---|------------|------|------|------|------|----------|
| 18 | Phantom uncertainty | B | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.3 | 2.3 | ∞ |
| 19 | Liquid conductivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| 20 | Liquid conductivity (meas.) | A | 2.06 | N | 1 | 0.64 | 0.43 | 1.32 | 0.89 | 43 |
| 21 | Liquid permittivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| 22 | Liquid permittivity (meas.) | A | 1.6 | N | 1 | 0.6 | 0.49 | 1.0 | 0.8 | 521 |
| Combined standard uncertainty | | $u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$ | | | | | | 10.1 | 9.95 | 257 |
| Expanded uncertainty (confidence interval of 95 %) | | $u_e = 2u_c$ | | | | | | 20.2 | 19.9 | |

16.4 Measurement Uncertainty for Fast SAR Tests (3~6GHz)

| No. | Error Description | Type | Uncertainty value | Probably Distribution | Div. | (Ci) 1g | (Ci) 10g | Std. Unc. (1g) | Std. Unc. (10g) | Degree of freedom |
|-----|-------------------|------|-------------------|-----------------------|------|---------|----------|----------------|-----------------|-------------------|
|-----|-------------------|------|-------------------|-----------------------|------|---------|----------|----------------|-----------------|-------------------|

Measurement system

| | | | | | | | | | | |
|----|---|---|------|---|------------|-----|-----|-----|-----|----------|
| 1 | Probe calibration | B | 6.5 | N | 1 | 1 | 1 | 6.5 | 6.5 | ∞ |
| 2 | Isotropy | B | 4.7 | R | $\sqrt{3}$ | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| 3 | Boundary effect | B | 2.0 | R | $\sqrt{3}$ | 1 | 1 | 1.2 | 1.2 | ∞ |
| 4 | Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 5 | Detection limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 6 | Readout electronics | B | 0.3 | R | $\sqrt{3}$ | 1 | 1 | 0.3 | 0.3 | ∞ |
| 7 | Response time | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 8 | Integration time | B | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.5 | 1.5 | ∞ |
| 9 | RF ambient conditions-noise | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 10 | RF ambient conditions-reflection | B | 0 | R | $\sqrt{3}$ | 1 | 1 | 0 | 0 | ∞ |
| 11 | Probe positioned mech. Restrictions | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 12 | Probe positioning with respect to phantom shell | B | 6.7 | R | $\sqrt{3}$ | 1 | 1 | 3.9 | 3.9 | ∞ |
| 13 | Post-processing | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 14 | Fast SAR z-Approximation | B | 14.0 | R | $\sqrt{3}$ | 1 | 1 | 8.1 | 8.1 | ∞ |

Test sample related

| | | | | | | | | | | |
|--|------------------------------|--|------|---|------------|------|------|------|------|----------|
| 15 | Test sample positioning | A | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 71 |
| 16 | Device holder uncertainty | A | 3.4 | N | 1 | 1 | 1 | 3.4 | 3.4 | 5 |
| 17 | Drift of output power | B | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.9 | 2.9 | ∞ |
| Phantom and set-up | | | | | | | | | | |
| 18 | Phantom uncertainty | B | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.3 | 2.3 | ∞ |
| 19 | Liquid conductivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| 20 | Liquid conductivity (meas.) | A | 2.06 | N | 1 | 0.64 | 0.43 | 1.32 | 0.89 | 43 |
| 21 | Liquid permittivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| 22 | Liquid permittivity (meas.) | A | 1.6 | N | 1 | 0.6 | 0.49 | 1.0 | 0.8 | 521 |
| Combined standard uncertainty | | $u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$ | | | | | | 13.3 | 13.2 | 257 |
| Expanded uncertainty (confidence interval of 95 %) | | $u_e = 2u_c$ | | | | | | 26.6 | 26.4 | |

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

| No. | Name | Type | Serial Number | Calibration Date | Valid Period |
|-----|-----------------------|---------------|---------------|--------------------------|--------------|
| 01 | Network analyzer | E5071C | MY46110673 | February 03, 2015 | One year |
| 02 | Power meter | NRVD | 102196 | March 03, 2015 | One year |
| 03 | Power sensor | NRV-Z5 | 100596 | | |
| 04 | Signal Generator | E4438C | MY49071430 | February 02, 2015 | One Year |
| 05 | Amplifier | 60S1G4 | 0331848 | No Calibration Requested | |
| 06 | BTS | E5515C | MY50263375 | January 30, 2015 | One year |
| 07 | BTS | CMW500 | 129942 | March 03, 2015 | One year |
| 08 | E-field Probe | SPEAG EX3DV4 | 3617 | August 26, 2015 | One year |
| 09 | DAE | SPEAG DAE4 | 777 | August 26, 2015 | One year |
| 10 | Dipole Validation Kit | SPEAG D750V3 | 1017 | July 23, 2015 | One year |
| 11 | Dipole Validation Kit | SPEAG D835V2 | 4d069 | July 23, 2015 | One year |
| 12 | Dipole Validation Kit | SPEAG D1750V2 | 1003 | July 16, 2015 | One year |
| 13 | Dipole Validation Kit | SPEAG D1900V2 | 5d142 | June 23, 2015 | One year |
| 14 | Dipole Validation Kit | SPEAG D2450V2 | 853 | June 24, 2015 | One year |

END OF REPORT BODY

ANNEX A Graph Results

CDMA BC0 Head Right Cheek Middle

Date: 2015-11-04

Electronics: DAE4 Sn777

Medium: Head 850 MHz

Medium parameters used: $f = 836.5$ MHz; $\sigma = 0.928$ mho/m; $\epsilon_r = 41.42$; $\rho = 1000$ kg/m³

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

Communication System: CDMA BC0 Frequency: 836.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3617 ConvF(9.56, 9.56, 9.56)

Area Scan (71x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.526 W/kg

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

Reference Value = 5.994 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.832 W/kg

SAR(1 g) = 0.493 W/kg; SAR(10 g) = 0.327 W/kg

Maximum value of SAR (measured) = 0.565 W/kg

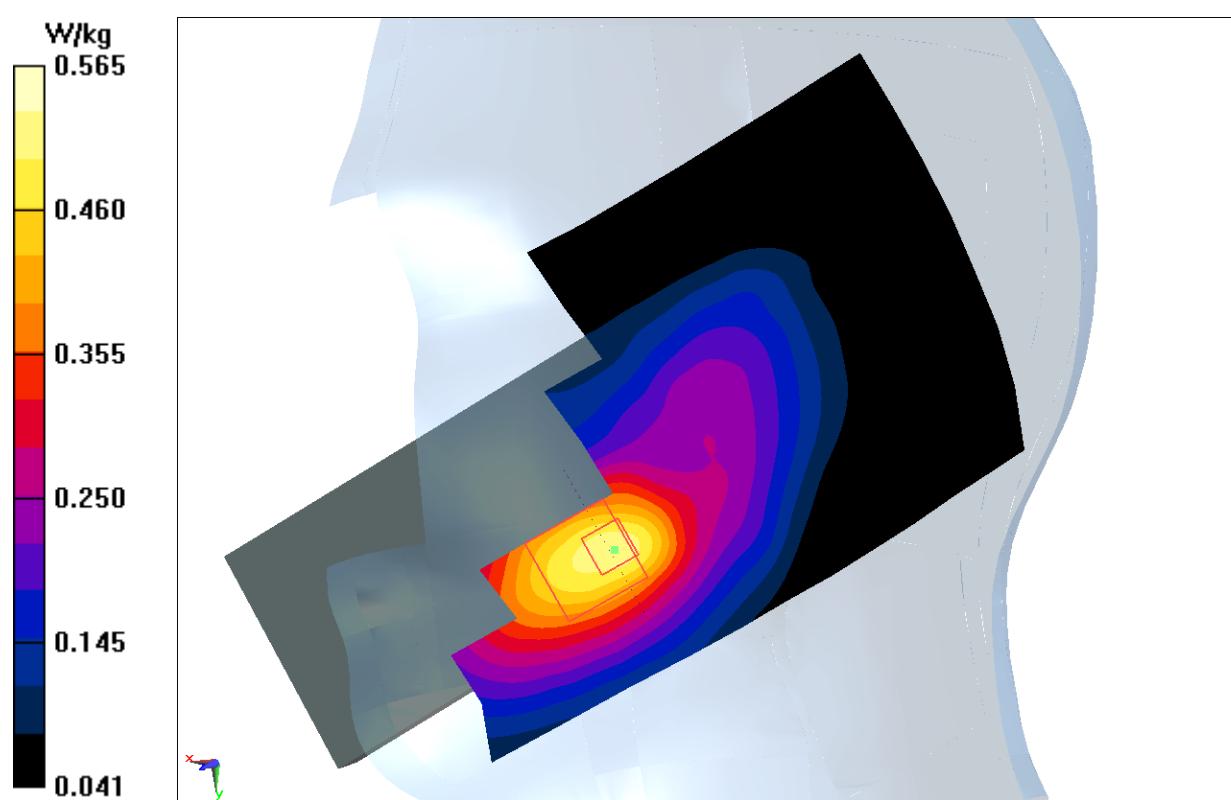


Fig.1 CDMA BC0

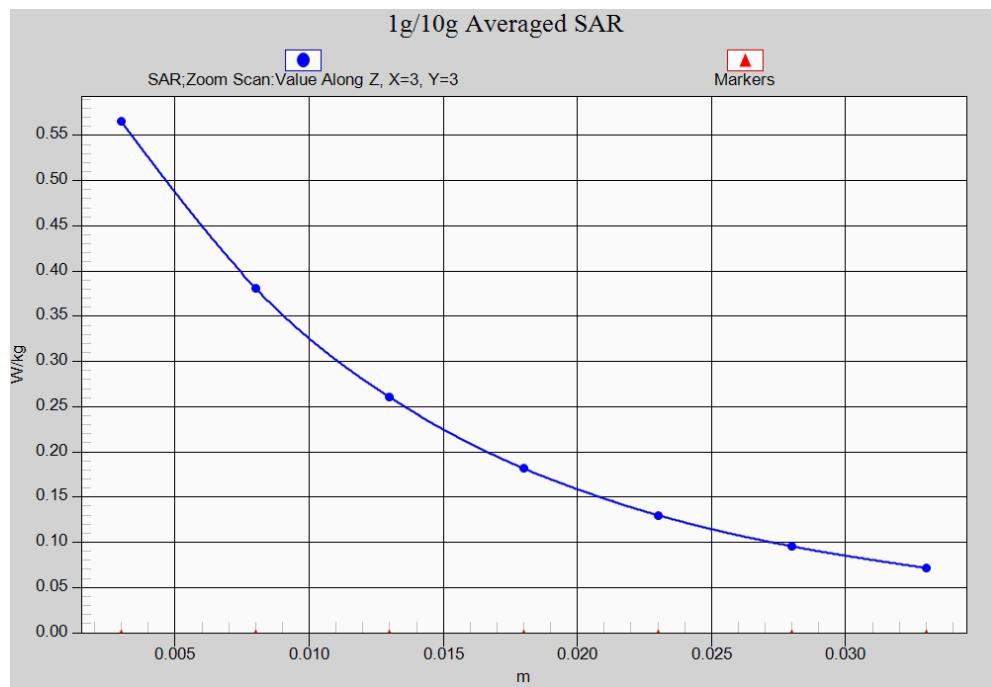


Fig. 1-1 Z-Scan at power reference point (CDMA BC0)

CDMA BC0 Body Rear closed Low

Date: 2015-11-04

Electronics: DAE4 Sn777

Medium: Body 850 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.964$ S/m; $\epsilon_r = 56.116$; $\rho = 1000$ kg/m³

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

Communication System: CDMA BC0 Frequency: 824.7 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3617 ConvF(9.71, 9.71, 9.71)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.869 W/kg

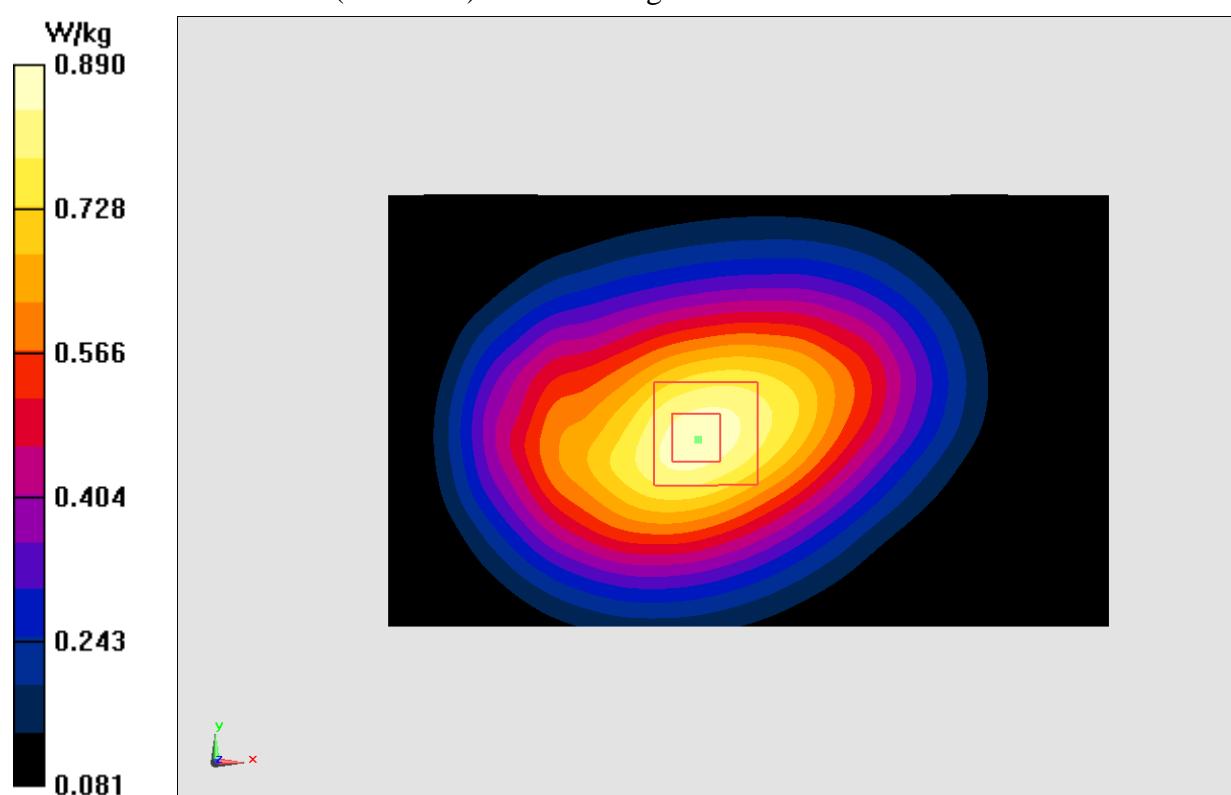
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.07 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.843 W/kg; SAR(10 g) = 0.617 W/kg

Maximum value of SAR (measured) = 0.890 W/kg

**Fig.2 CDMA BC0**

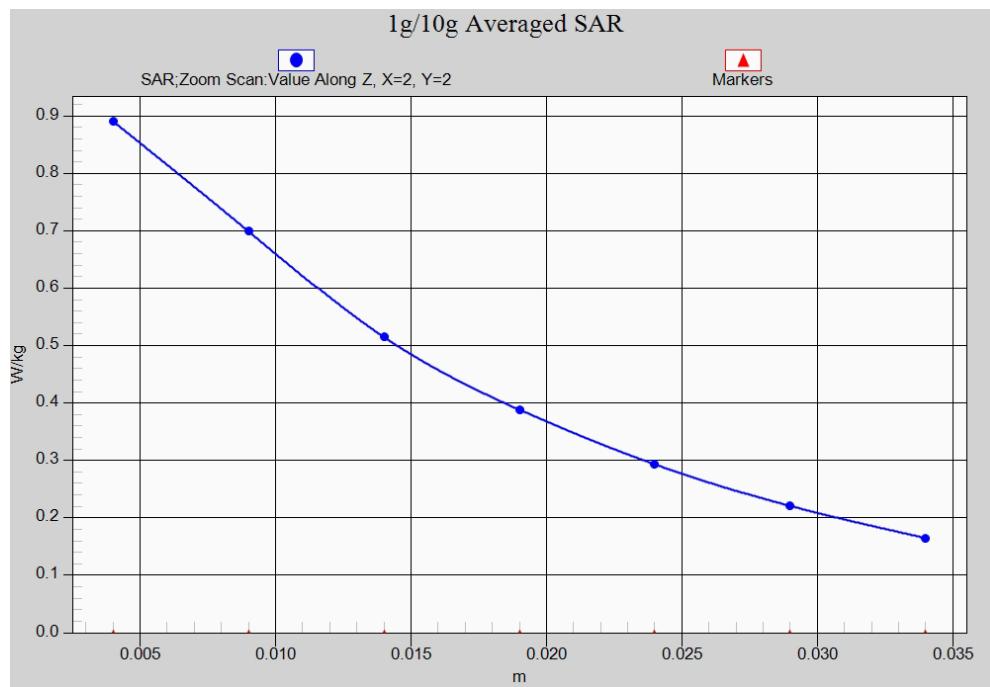


Fig. 2-1 Z-Scan at power reference point (CDMA BC0)

CDMA BC1 Head Left Cheek Low

Date: 2015-11-05

Electronics: DAE4 Sn777

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.386$ mho/m; $\epsilon_r = 40.356$; $\rho = 1000$ kg/m³

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

Communication System: CDMA BC1 Frequency: 1851.25 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3617 ConvF(8.07, 8.07, 8.07)

Area Scan (61x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.514 W/kg

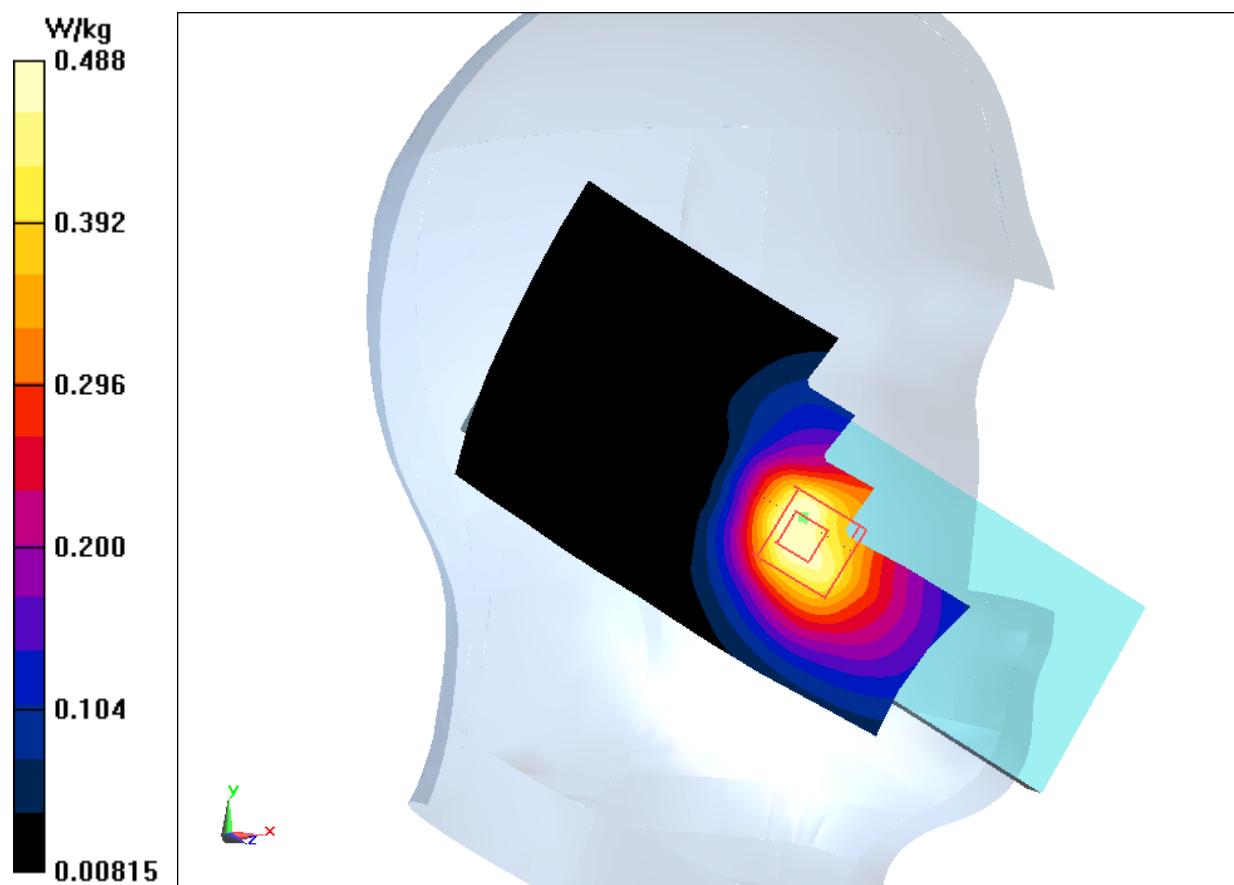
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.187 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.629 W/kg

SAR(1 g) = 0.434 W/kg; SAR(10 g) = 0.278 W/kg

Maximum value of SAR (measured) = 0.488 W/kg

**Fig.3 CDMA BC1**

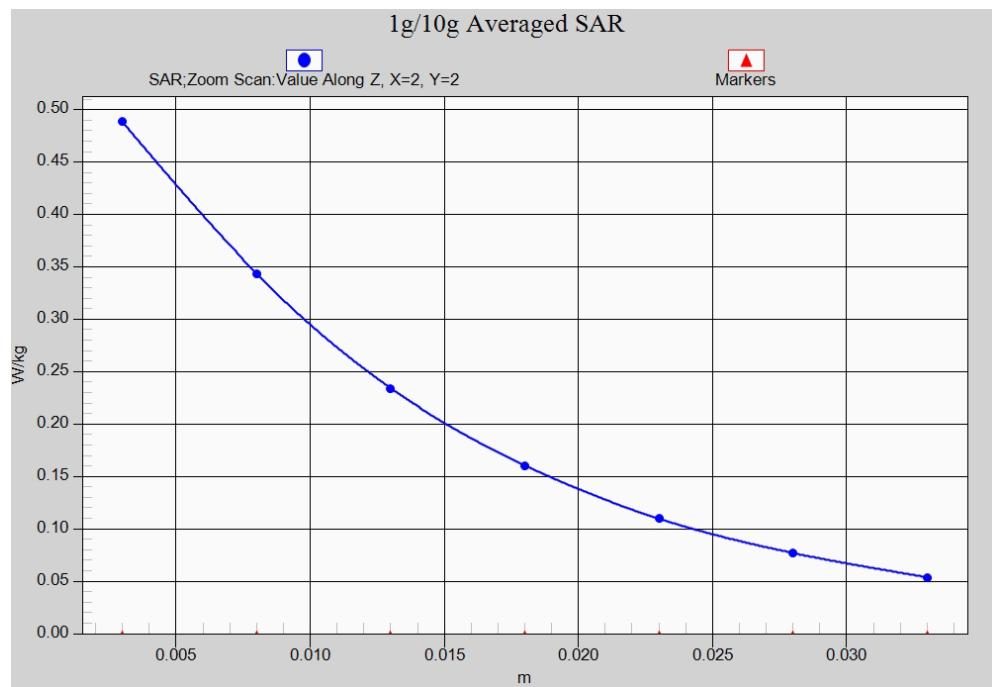


Fig. 3-1 Z-Scan at power reference point (CDMA BC1)

CDMA BC1 Body Rear closed Middle

Date: 2015-11-05

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.571$ mho/m; $\epsilon_r = 53.212$; $\rho = 1000$ kg/m³

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

Communication System: CDMA BC1 Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3617 ConvF(7.74, 7.74, 7.74)

Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.595 W/kg

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

Reference Value = 12.98 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.876 W/kg

SAR(1 g) = 0.538 W/kg; SAR(10 g) = 0.325 W/kg

Maximum value of SAR (measured) = 0.579 W/kg

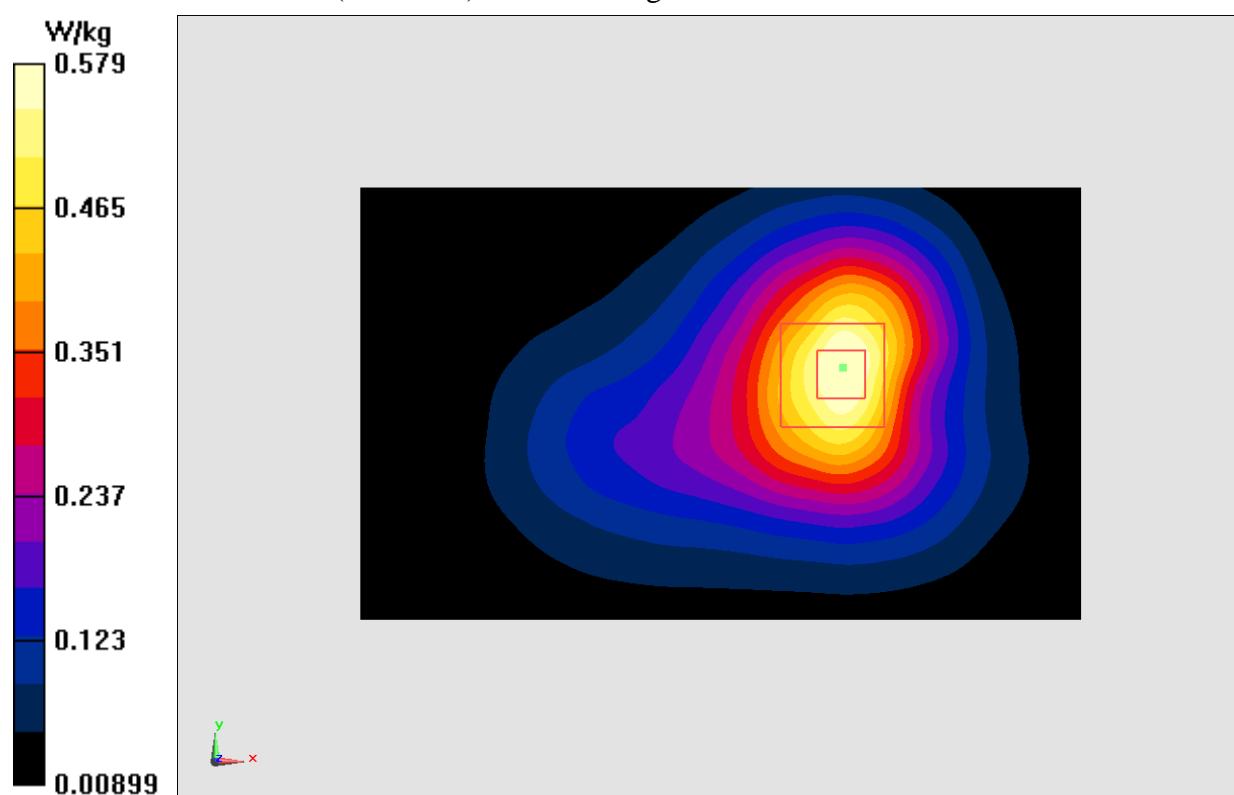


Fig.4 CDMA BC1

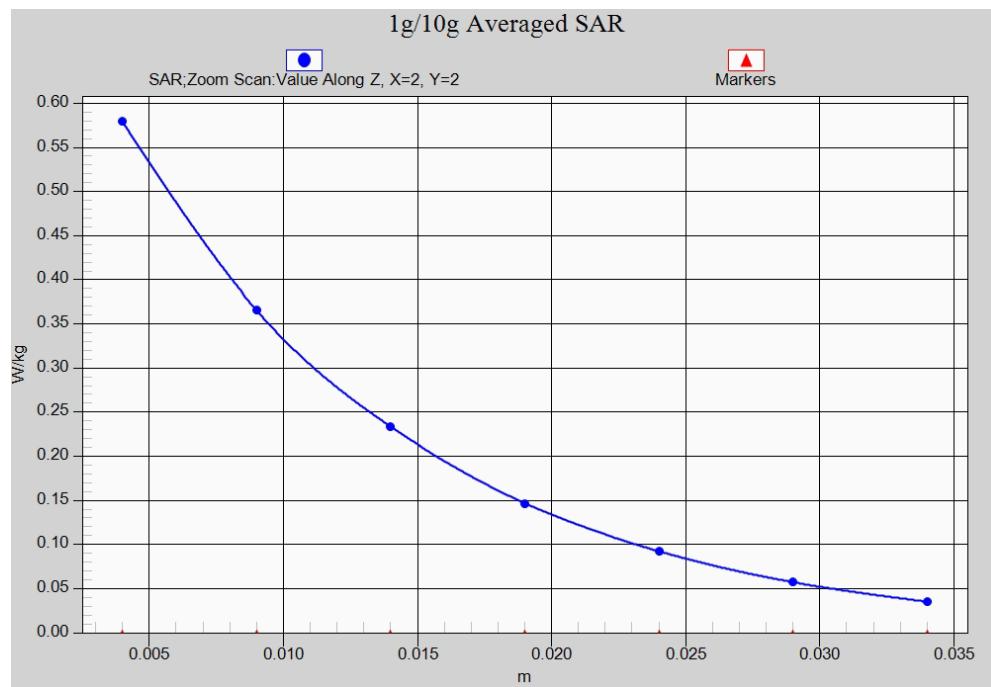


Fig.4-1 Z-Scan at power reference point (CDMA BC1)

LTE Band4 Left Cheek High with QPSK_20M_1RB_Middle

Date: 2015-10-19

Electronics: DAE4 Sn777

Medium: Head 1750 MHz

Medium parameters used: $f = 1745$ MHz; $\sigma = 1.452$ mho/m; $\epsilon_r = 39.662$; $\rho = 1000$ kg/m³

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

Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3617 ConvF(8.34, 8.34, 8.34)

Area Scan (61x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.313 W/kg

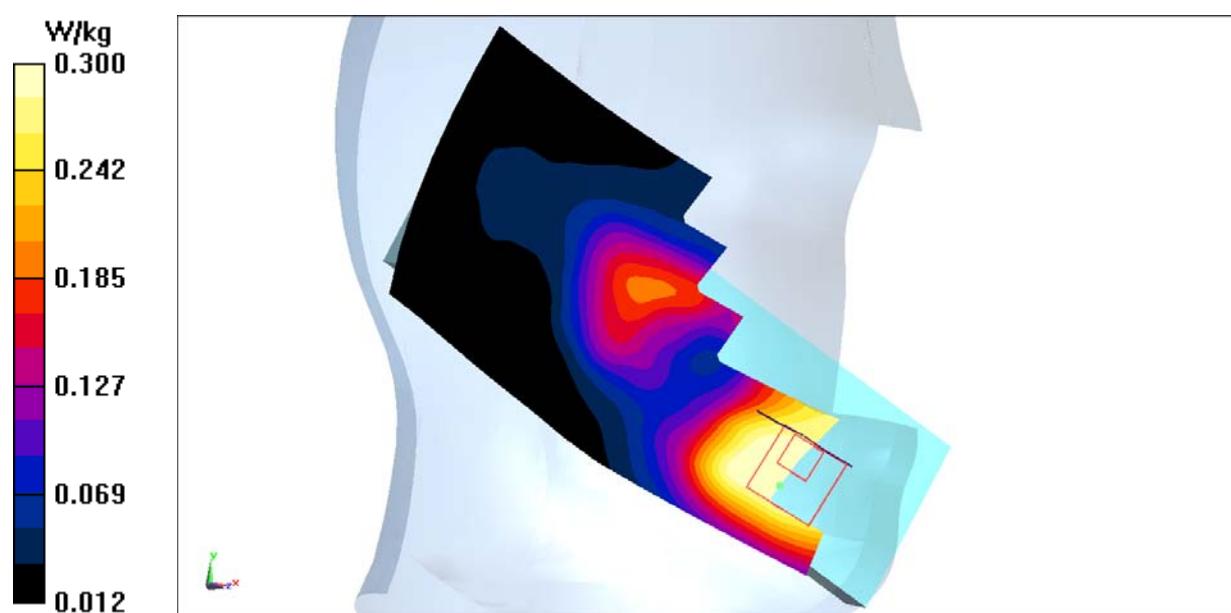
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.636 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.389 W/kg

SAR(1 g) = 0.261 W/kg; SAR(10 g) = 0.180 W/kg

Maximum value of SAR (measured) = 0.300 W/kg

**Fig.5 LTE Band4**

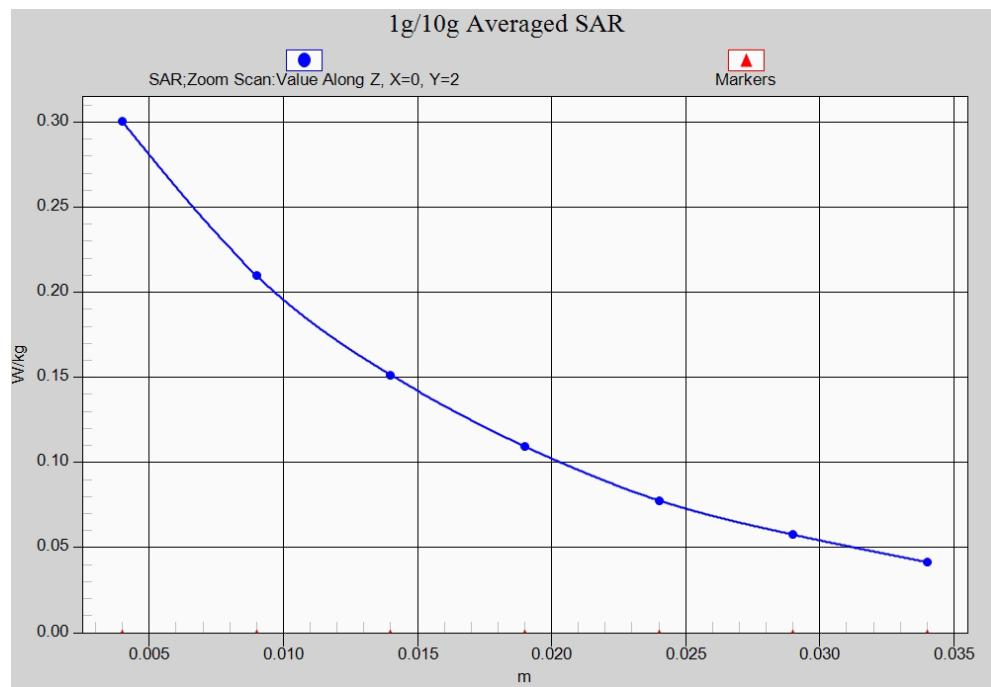


Fig.5-1 Z-Scan at power reference point (LTE Band4)

LTE Band4 Body Rear open Middle with QPSK_20M_1RB_Middle

Date: 2015-10-19

Electronics: DAE4 Sn777

Medium: Body 1750 MHz

Medium parameters used: $f = 1732.5$ MHz; $\sigma = 1.483$ mho/m; $\epsilon_r = 52.875$; $\rho = 1000$ kg/m³

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

Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3617 ConvF(7.96, 7.96, 7.96)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.46 W/kg

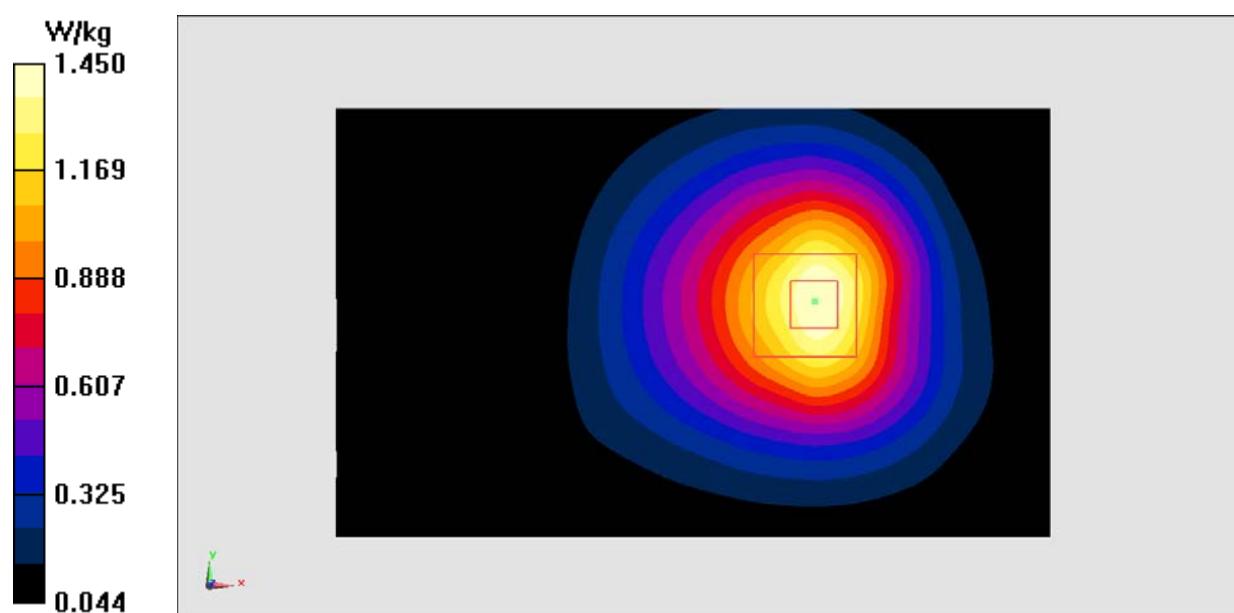
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.77 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.74 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.722 W/kg

Maximum value of SAR (measured) = 1.45 W/kg

**Fig.6 LTE Band4**