FCC SAR Test Report

APPLICANT	: Lenovo (Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT	: Portable Tablet Computer
BRAND NAME	: lenovo
MODEL NAME	: 501LV, 502LV
MARKETING NAME	: Lenovo TAB2
FCC ID	: O57TAB2A8
STANDARD	: FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
2353

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA582002	Rev. 01	Initial issue of report	Sep. 28, 2015

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Lenovo (Shanghai) Electronics Technology Co., Ltd., Portable Tablet Computer, 501LV, 502LV** are as follows.

<Highest Standalone SAR Summary>

Equipment Class	Frequency Band	Highest SAR Summary	
		Head 1g SAR (W/kg)	Body 1g SAR (W/kg)
PCB	GSM850	<0.10	1.15
	GSM1900	0.11	1.05
	LTE Band 41	<0.10	**1.20**
DTS	WLAN 2.4GHz Band	**0.40**	1.15
DSS	Bluetooth		
Date of Testing:		Sep. 01, 2015 ~ Sep. 04, 2015	

<Highest Simultaneous Transmission SAR>

Exposure Position	Frequency Band	Equipment Class	Highest Simultaneous Transmission SAR (W/kg)
Head	GSM1900	PCB	0.51
	WLAN 2.4GHz Band	DTS	
Body	LTE Band 41	PCB	1.20
	WLAN 2.4GHz Band	DTS	
Body	LTE Band 41	PCB	1.33
	Bluetooth	DSS	

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

2. Administration Data

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.
Test Site Location	1F & 2F,Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595

Applicant	
Company Name	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address	No. 68 Building, 199 Fenju Road, Wai Gao Qiao FTZ , Shanghai , China

Manufacturer	
Company Name	Lenovo PC HK Limited
Address	'23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

3. Guidance Standard

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r02
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r01
- FCC KDB 616217 D04 SAR for laptop and tablets v01r01
- FCC KDB 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Portable Tablet Computer
Brand Name	lenovo
Model Name	501LV, 502LV
Marketing Name	Lenovo TAB2
FCC ID	O57TAB2A8
IMEI Code	867651020003945
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz LTE Band 41: 2547.5 MHz ~ 2652.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	· GPRS/EGPRS · LTE: QPSK, 16QAM · 802.11b/g/n HT20 · Bluetooth v3.0+EDR, Bluetooth v4.0 LE
HW Version	LenovoPad A8-50F
SW Version	A8-50F_150520
EUT Stage	Identical Prototype

Remark:
1. This device supported VoIP in GPRS, EGPRS, WCDMA, LTE (e.g. 3rd party VoIP).
2. The EUT can work near ear considering the VOIP function.
3. 802.11n-HT40 is not supported in 2.4GHz WLAN.
4. This device supports GRPS/EGPRS mode up to multi-slot class12.

4.2 Maximum Tune-up Limit

Mode	Burst average power (dBm)			
	GSM 850		GSM 1900	
	Full power mode	Reduced power mode	Full power mode	Reduced power mode
GPRS (GMSK, 1 Tx slot)	32.5	29.5	29.0	18.0
GPRS (GMSK, 2 Tx slots)	32.0	26.5	28.5	18.0
GPRS (GMSK, 3 Tx slots)	30.5	24.5	27.0	18.0
GPRS (GMSK, 4 Tx slots)	29.5	23.5	26.0	18.0
EDGE (8PSK, 1 Tx slot)	27.5	24.0	26.0	14.5
EDGE (8PSK, 2 Tx slots)	26.5	21.0	25.0	14.5
EDGE (8PSK, 3 Tx slots)	24.5	19.5	23.0	14.5
EDGE (8PSK, 4 Tx slots)	23.5	18.0	22.0	14.0

LTE Band 41					
Average Power (dBm)					
Modulation	BW (MHz)	RB size	MPR	Full power mode	Reduced power mode
QPSK	20	≤ 18	0	22.5	14.5
QPSK	20	> 18	0-1	21.5	14.5
16QAM	20	≤ 18	0-1	21.5	14.5
16QAM	20	> 18	0-2	20.5	14.5
QPSK	15	≤ 16	0	22.5	14.5
QPSK	15	> 16	0-1	21.5	14.5
16QAM	15	≤ 16	0-1	21.5	14.5
16QAM	15	> 16	0-2	20.5	14.5
QPSK	10	≤ 12	0	22.5	14.5
QPSK	10	> 12	0-1	21.5	14.5
16QAM	10	≤ 12	0-1	21.5	14.5
16QAM	10	> 12	0-2	20.5	14.5
QPSK	5	≤ 8	0	22.5	14.5
QPSK	5	> 8	0-1	21.5	14.5
16QAM	5	≤ 8	0-1	21.5	14.5
16QAM	5	> 8	0-2	20.5	14.5

Mode		Average Power (dBm)
2.4GHz	802.11b	14.0
	802.11g	13.0
	802.11n-HT20	11.0
Bluetooth v3.0 + EDR		5.0
Bluetooth v4.0 LE		-2.5

4.3 General LTE SAR Test and Reporting Considerations

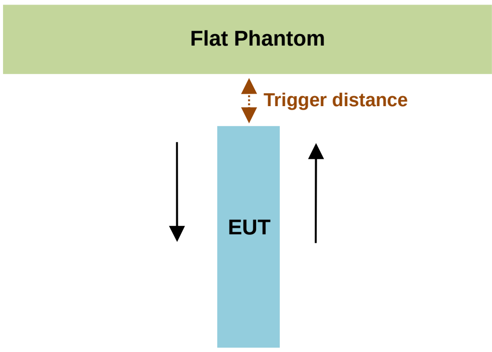
<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r03</th></tr>
<tr><td>FCC ID</td><td>O57TAB2A8</td></tr>
<tr><td>Equipment Name</td><td>Portable Tablet Computer</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 41: 2547.5 MHz ~ 2652.5 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK, and 16QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Data only</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
</table></td></tr>
<tr><td>LTE A-MPR</td><td>In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td>LTE Release</td><td>R9</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, Proximity Sensor.</td></tr>
</table>

<table>
<tr><th colspan="9">LTE Band 41</th></tr>
<tr><th rowspan="2"></th><th colspan="2">Bandwidth 5 MHz</th><th colspan="2">Bandwidth 10 MHz</th><th colspan="2">Bandwidth 15 MHz</th><th colspan="2">Bandwidth 20 MHz</th></tr>
<tr><th>Ch. #</th><th>Freq. (MHz)</th><th>Ch. #</th><th>Freq. (MHz)</th><th>Ch. #</th><th>Freq. (MHz)</th><th>Ch. #</th><th>Freq. (MHz)</th></tr>
<tr><td>L</td><td>40165</td><td>2547.5</td><td>40190</td><td>2550</td><td>40215</td><td>2552.5</td><td>40240</td><td>2555</td></tr>
<tr><td>M</td><td>40690</td><td>2600</td><td>40690</td><td>2600</td><td>40690</td><td>2600</td><td>40690</td><td>2600</td></tr>
<tr><td>H</td><td>41215</td><td>2652.5</td><td>41190</td><td>2650</td><td>41165</td><td>2647.5</td><td>41140</td><td>2645</td></tr>
</table>

5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated in the exhibit “P-Sensor operational description”, and the shortest triggering distances were reported and used for SAR assessment.
In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



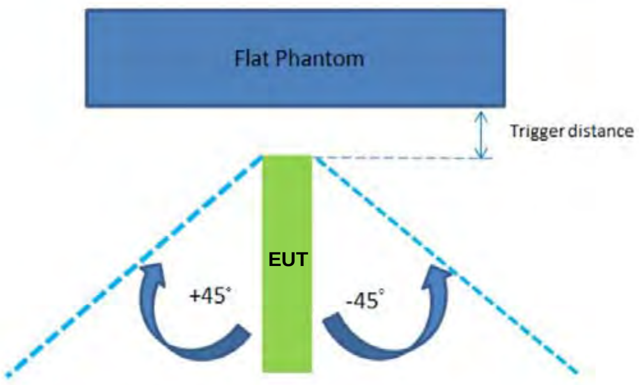
Proximity Sensor Trigger Distance (mm)		
Position	Bottom Face	Edge 3
Minimum	17	10

<Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.

<Tablet Tilt angle influences to proximity sensor triggering (KDB 616217 D04 section 6.4)>:

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 10 mm separation.
Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



The Sensor Trigger Distance (mm)	
Position	Edge 3
Minimum	10

Proximity sensor power reduction

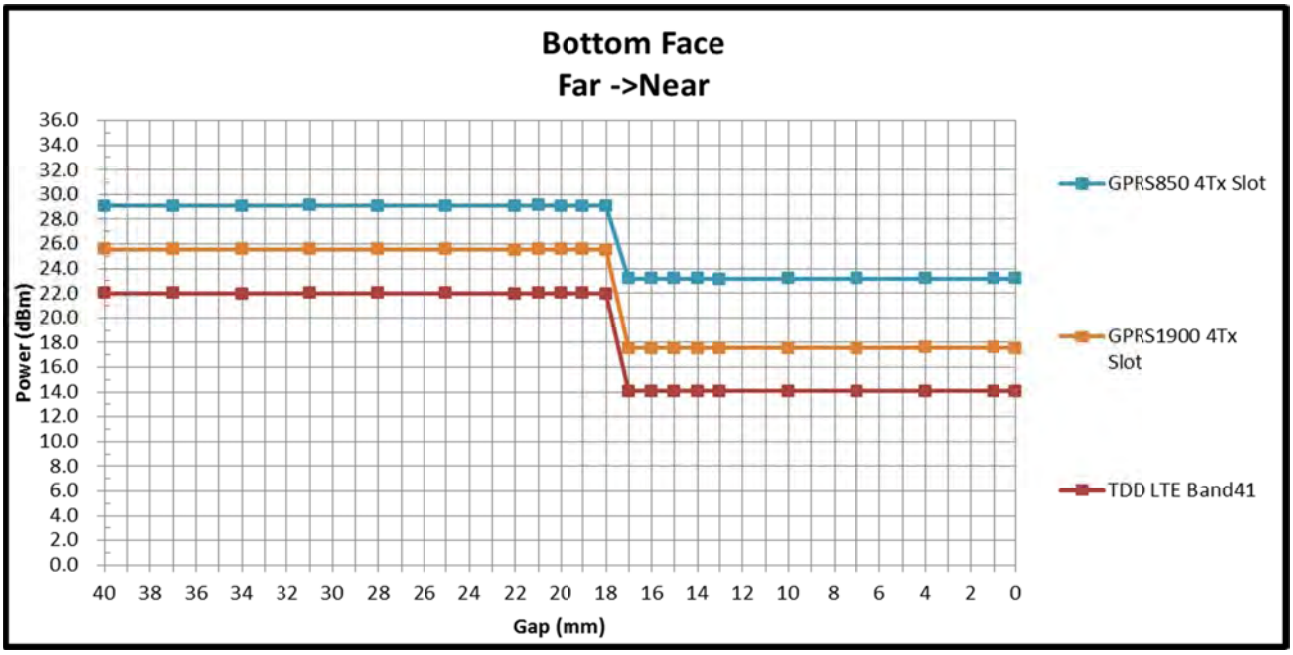
Exposure Position / wireless mode	Bottom Face[1]	Edge 1	Edge 2	Edge 3[1]	Edge 4
GSM850 GPRS (GMSK 1 Tx slot) - CS1	3.0 dB	0 dB	0 dB	3.0 dB	0 dB
GSM850 GPRS (GMSK 2 Tx slot) - CS1	5.5 dB	0 dB	0 dB	5.5 dB	0 dB
GSM850 GPRS (GMSK 3 Tx slots) - CS1	6.0 dB	0 dB	0 dB	6.0 dB	0 dB
GSM850 GPRS (GMSK 4 Tx slots) - CS1	6.0 dB	0 dB	0 dB	6.0 dB	0 dB
GSM850 EDGE (8PSK 1 Tx slot) - MCS5	3.5 dB	0 dB	0 dB	3.5 dB	0 dB
GSM850 EDGE (8PSK 2 Tx slot) - MCS5	5.5 dB	0 dB	0 dB	5.5 dB	0 dB
GSM850 EDGE (8PSK 3 Tx slot) - MCS5	5.0 dB	0 dB	0 dB	5.0 dB	0 dB
GSM850 EDGE (8PSK 4 Tx slot) - MCS5	5.5 dB	0 dB	0 dB	5.5 dB	0 dB
GSM1900 GPRS (GMSK 1 Tx slot) - CS1	11.0 dB	0 dB	0 dB	11.0 dB	0 dB
GSM1900 GPRS (GMSK 2 Tx slot) - CS1	10.5 dB	0 dB	0 dB	10.5 dB	0 dB
GSM1900 GPRS (GMSK 3 Tx slots) - CS1	9.0 dB	0 dB	0 dB	9.0 dB	0 dB
GSM1900 GPRS (GMSK 4 Tx slots) - CS1	8.0 dB	0 dB	0 dB	8.0 dB	0 dB
GSM1900 EDGE (8PSK 1 Tx slot) - MCS5	11.5 dB	0 dB	0 dB	11.5 dB	0 dB
GSM1900 EDGE (8PSK 2 Tx slot) - MCS5	10.5 dB	0 dB	0 dB	10.5 dB	0 dB
GSM1900 EDGE (8PSK 3 Tx slot) - MCS5	8.5 dB	0 dB	0 dB	8.5 dB	0 dB
GSM1900 EDGE (8PSK 4 Tx slot) - MCS5	8.0 dB	0 dB	0 dB	8.0 dB	0 dB
LTE Band 41	8.0 dB	0 dB	0 dB	8.0 dB	0 dB

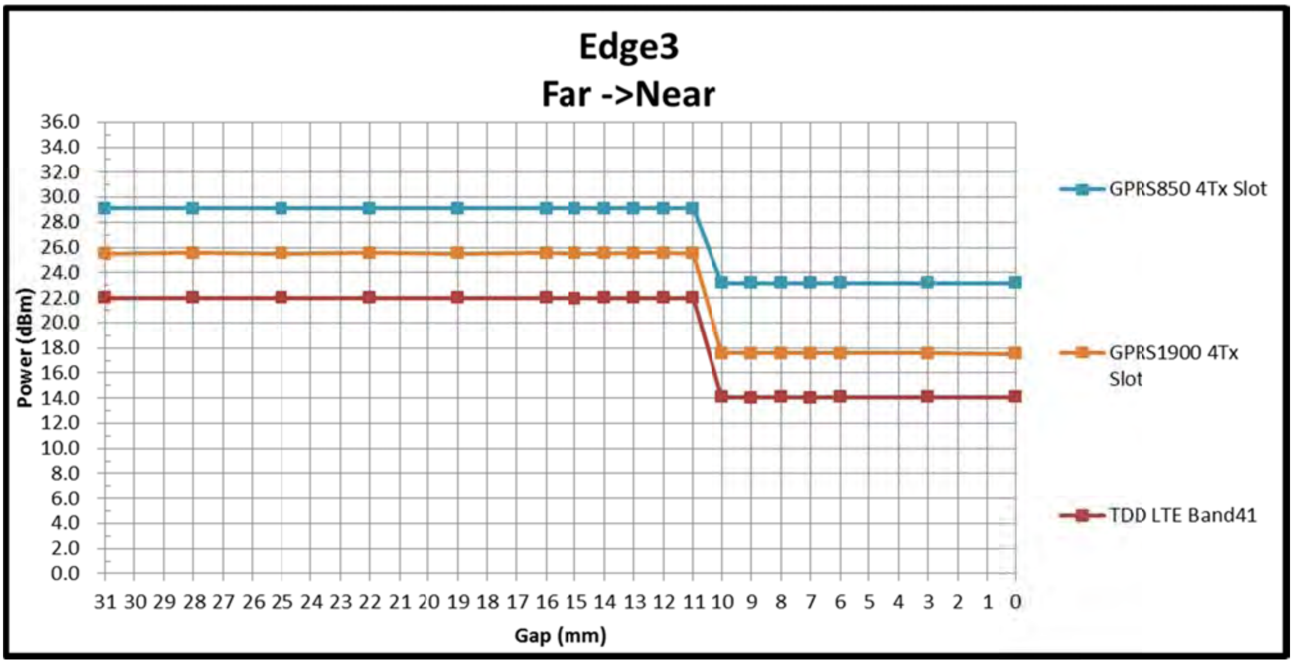
Remark:

1. [1]: Reduced maximum limit applied by activation of proximity sensor.
2. Power reduction is not applicable for WLAN and Bluetooth.
3. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit “P-Sensor operational description
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   - Bottom Face: 10 mm
   - Edge3: 8 mm

Power Measurement during Sensor Trigger distance testing

Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels
		w/o power back-off	w/ power back-off	(dB)
GSM850 GPRS (GMSK 4 Tx slots)	189	28.89	23.01	5.88
GSM1900 GPRS (GMSK 4 Tx slots)	661	25.38	17.42	7.96
LTE Band 41 (BW20,RB Size 1,RB Offset 99)	40690	21.85	13.95	7.9





6. RF Exposure Limits

6.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 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:

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

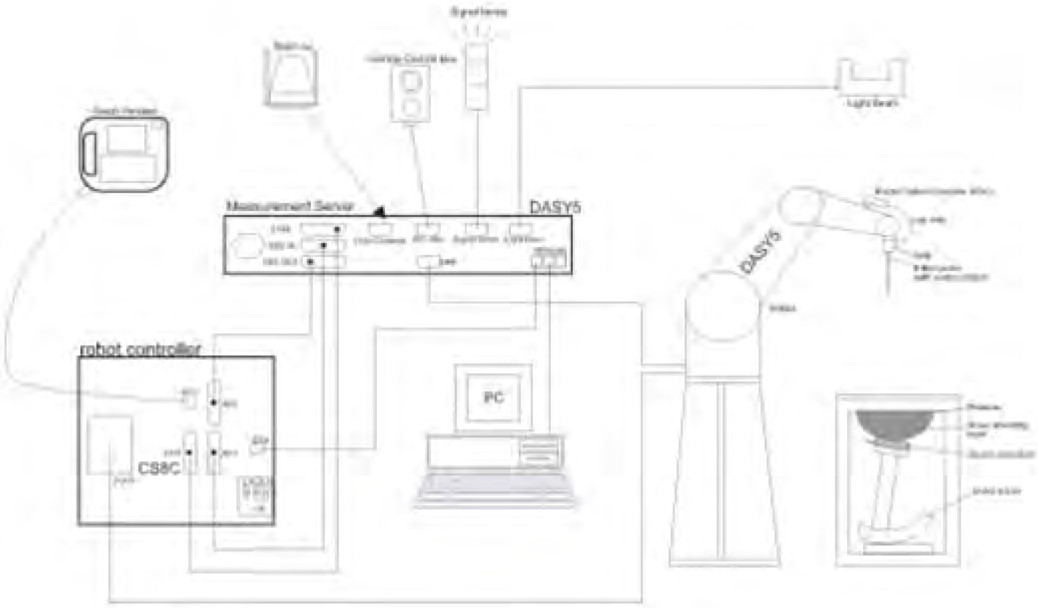
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot 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 or Win7 and the 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.

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

<table>
<tr><th colspan="3"></th><th>$\leq$ 3 GHz</th><th>$>$ 3 GHz</th></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>$\leq$ 2 GHz: $\leq$ 8 mm
2 – 3 GHz: $\leq$ 5 mm*</td><td>3 – 4 GHz: $\leq$ 5 mm*
4 – 6 GHz: $\leq$ 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>$\leq$ 5 mm</td><td>3 – 4 GHz: $\leq$ 4 mm
4 – 5 GHz: $\leq$ 3 mm
5 – 6 GHz: $\leq$ 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>$\leq$ 4 mm</td><td>3 – 4 GHz: $\leq$ 3 mm
4 – 5 GHz: $\leq$ 2.5 mm
5 – 6 GHz: $\leq$ 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>$\geq$ 30 mm</td><td>3 – 4 GHz: $\geq$ 28 mm
4 – 5 GHz: $\geq$ 25 mm
5 – 6 GHz: $\geq$ 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 reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 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>

9.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 21, 2014	Nov. 20, 2015
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2014	Nov. 20, 2015
SPEAG	2450MHz System Validation Kit	D2450V2	840	Nov. 19, 2014	Nov. 18, 2015
SPEAG	2600MHz System Validation Kit	D2600V2	1061	Nov. 19, 2014	Nov. 18, 2015
SPEAG	Data Acquisition Electronics	DAE4	1303	Dec. 11, 2014	Dec. 10, 2015
SPEAG	Data Acquisition Electronics	DAE4	1386	Feb. 19, 2015	Feb. 18, 2016
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Nov. 13, 2014	Nov. 12, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3898	Aug. 06, 2015	Aug. 05, 2016
SPEAG	SAM Twin Phantom	QD 000 P40 CD	TP-1671	NCR	NCR
SPEAG	ELI4 Phantom	QD OVA 002 AA	TP-1149	NCR	NCR
SPEAG	ELI4 Phantom	QD OVA 00 BB	TP-1232	NCR	NCR
SPEAG	ELI4 Phantom	QD OVA 00 BB	TP-1233	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201432827	Jan. 15, 2015	Jan. 14, 2016
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Aug. 07, 2015	Aug. 06, 2016
R&S	Network Analyzer	ZVB8	100106	Sep. 29, 2014	Sep. 28, 2015
Speag	Dielectric Assessment KIT	DAK-3.5	1032	NCR	NCR
R&S	Signal Generator	SMBV100A	258305	Jan. 23, 2015	Jan. 22, 2016
Anritsu	Power Sensor	MA2411B	1207253	Jan. 28, 2015	Jan. 27, 2016
Anritsu	Power Meter	ML2495A	1218010	Jan. 28, 2015	Jan. 27, 2016
Anritsu	Power Senor	MA2411B	917070	Jan. 23, 2015	Jan. 22, 2016
Anritsu	Power Meter	ML2495A	1005002	Jan. 23, 2015	Jan. 22, 2016
ARRA	Power Divider	A3200-2	N/A	NA	NA
R&S	Spectrum Analyzer	FSP7	101634	Aug. 07, 2015	Aug. 06, 2016
Agilent	Dual Directional Coupler	778D	50422	Note1	
Woken	Attenuator 1	WK0602-XX	N/A	Note1	
PE	Attenuator 2	PE7005-10	N/A	Note1	
PE	Attenuator 3	PE7005- 3	N/A	Note1	
AR	Power Amplifier	5S1G4M2	0328767	Note1	
Mini-Circuits	Power Amplifier	ZVE-3W	162601250	Note1	
Mini-Circuits	Power Amplifier	ZHL-42W+	13440021344	Note1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

11. System Verification

11.1 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	22.6	0.927	42.674	0.90	41.50	3.00	2.83	±5	Sep. 03, 2015
1900	Head	22.5	1.417	40.994	1.40	40.00	1.21	2.49	±5	Sep. 01, 2015
2450	Head	22.8	1.861	39.575	1.80	39.20	3.39	0.96	±5	Sep. 04, 2015
2600	Head	22.8	2.053	37.984	1.96	39.00	4.74	-2.61	±5	Sep. 03, 2015
835	Body	22.9	0.998	54.379	0.97	55.20	2.89	-1.49	±5	Sep. 03, 2015
1900	Body	22.7	1.542	53.532	1.52	53.30	1.45	0.44	±5	Sep. 03, 2015
2450	Body	22.7	1.909	50.971	1.95	52.70	-2.10	-3.28	±5	Sep. 01, 2015
2600	Body	22.8	2.209	51.123	2.16	52.50	2.27	-2.62	±5	Sep. 02, 2015

11.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured SAR (W/kg)	Targeted SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
Sep. 03, 2015	835	Head	250	4d091	3819	1303	2.44	9.11	9.76	7.14
Sep. 01, 2015	1900	Head	250	5d118	3819	1303	9.30	40.10	37.2	-7.23
Sep. 04, 2015	2450	Head	250	840	3819	1303	13.40	52.30	53.6	2.49
Sep. 03, 2015	2600	Head	250	1061	3819	1303	14.53	56.90	58.12	2.14
Sep. 03, 2015	835	Body	250	4d091	3898	1386	2.38	9.60	9.52	-0.83
Sep. 03, 2015	1900	Body	250	5d118	3819	1303	10.80	40.00	43.2	8.00
Sep. 01, 2015	2450	Body	250	840	3819	1303	11.80	51.00	47.2	-7.45
Sep. 02, 2015	2600	Body	250	1061	3819	1303	13.90	54.90	55.6	1.28

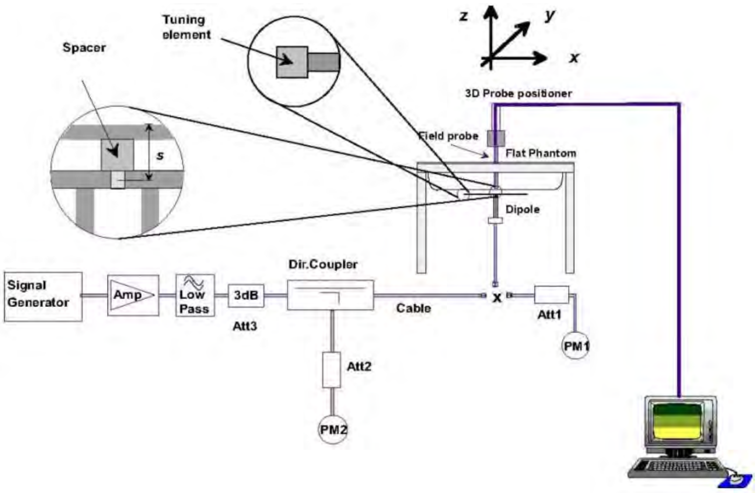


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled "M," the left ear reference point (ERP) is marked "LE," and the right ERP is marked "RE." Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

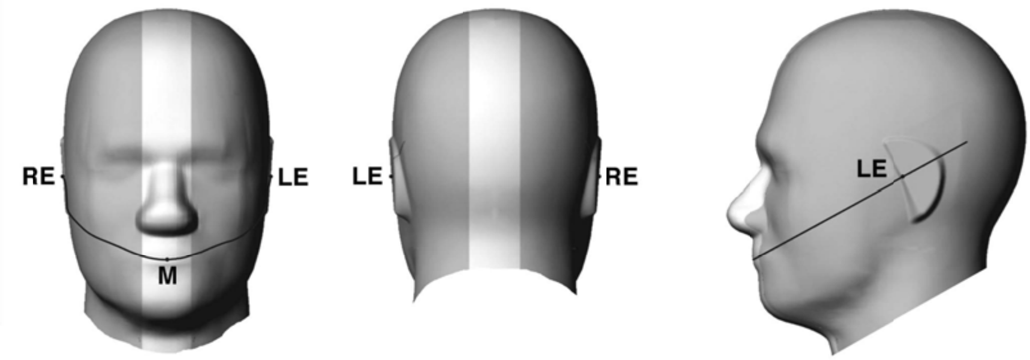


Fig 9.1.1 Front, back, and side views of SAM twin phantom

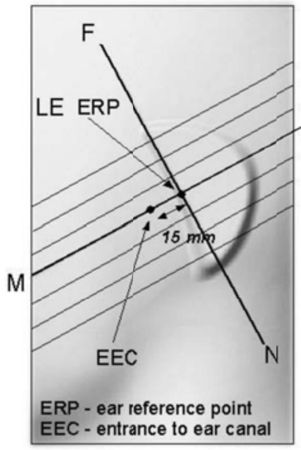


Fig 9.1.2 Close-up side view of phantom showing the ear region.

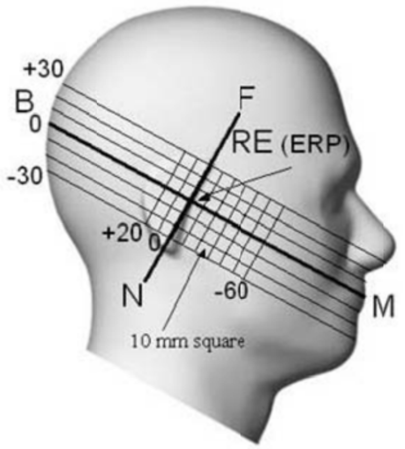


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

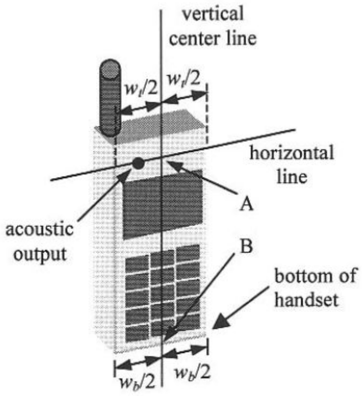


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

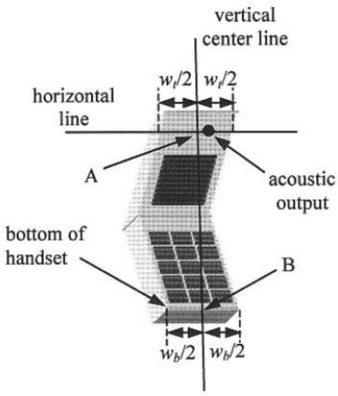


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

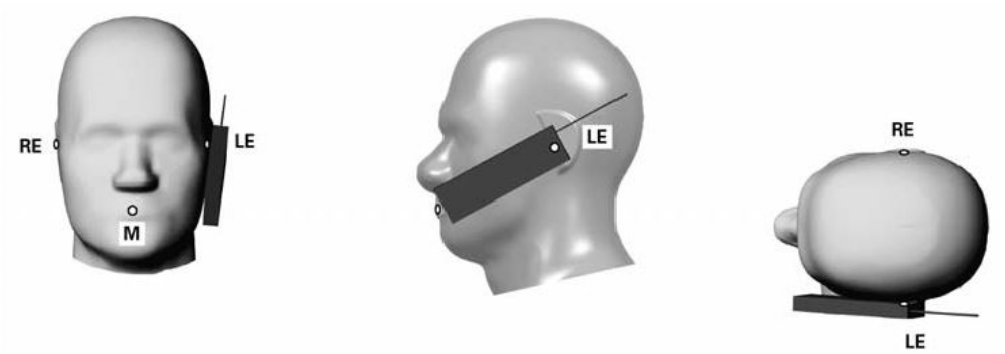


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

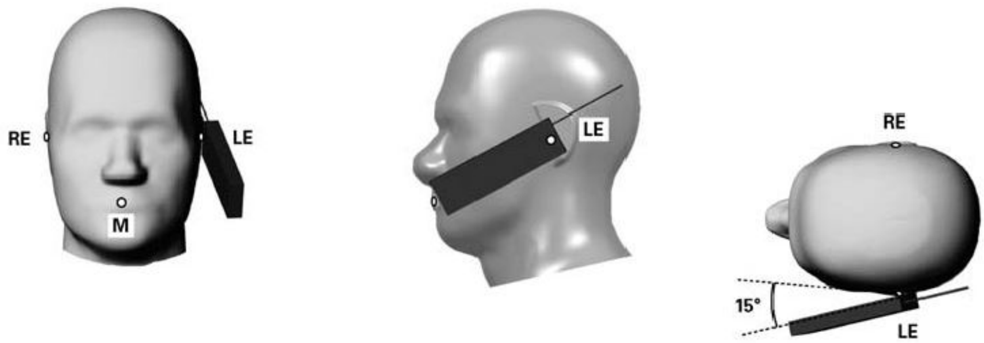


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v05r02 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

This EUT was tested in five different positions. They are bottom-face of tablet PC, Edge1, Edge2, Edge3 and Edge4. EUT has proximity sensor function, it would be on bottom-face and Edge3 active, the sensor trigger distance is 17mm for bottom-face and 10mm for Edge3, EUT transmitting reduced power was performed. Additional the surface of EUT is touching with phantom 0 cm for Edge2 and Edge 4 with full power.

13. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03, considering the possibility of e.g. 3rd party VoIP operation for Head and body-worn SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900.
3. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
4. Per KDB 941225 D01v03, for Body SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the GPRS 4Tx slots modes was selected when EUT operating without power back-off, the GPRS 4Tx slots modes was selected when EUT operating with power back-off, according to the highest source-based time-averaged output power.

Maximum Average RF Power (Proximity Sensor Inactive)

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GPRS (GMSK, 1 Tx slot) – CS1	31.80	**31.84**	31.83	32.50	22.80	22.84	22.83	23.50
GPRS (GMSK, 2 Tx slots) – CS1	31.38	31.45	31.43	32.00	25.38	25.45	25.43	26.00
GPRS (GMSK, 3 Tx slots) – CS1	29.90	29.95	29.93	30.50	25.64	25.69	25.67	26.24
GPRS (GMSK, 4 Tx slots) – CS1	28.87	28.89	28.88	29.50	25.87	**25.89**	25.88	26.50
EDGE (8PSK, 1 Tx slot) – MCS5	26.98	26.78	26.87	27.50	17.98	17.78	17.87	18.50
EDGE (8PSK, 2 Tx slots) – MCS5	25.66	25.58	25.76	26.50	19.66	19.58	19.76	20.50
EDGE (8PSK, 3 Tx slots) – MCS5	23.82	23.93	23.94	24.50	19.56	19.67	19.68	20.24
EDGE (8PSK, 4 Tx slots) – MCS5	22.62	22.68	22.72	23.50	19.62	19.68	19.72	20.50
Band GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GPRS (GMSK, 1 Tx slot) – CS1	**28.76**	28.75	28.72	29.00	19.76	19.75	19.72	20.00
GPRS (GMSK, 2 Tx slots) – CS1	28.16	28.11	28.15	28.50	22.16	22.11	22.15	22.50
GPRS (GMSK, 3 Tx slots) – CS1	26.43	26.41	26.36	27.00	22.17	22.15	22.10	22.74
GPRS (GMSK, 4 Tx slots) – CS1	25.39	25.38	25.34	26.00	**22.39**	22.38	22.34	23.00
EDGE (8PSK, 1 Tx slot) – MCS5	25.44	25.49	25.40	26.00	16.44	16.49	16.40	17.00
EDGE (8PSK, 2 Tx slots) – MCS5	24.45	24.43	24.39	25.00	18.45	18.43	18.39	19.00
EDGE (8PSK, 3 Tx slots) – MCS5	22.32	22.35	22.37	23.00	18.06	18.09	18.11	18.74
EDGE (8PSK, 4 Tx slots) – MCS5	21.23	21.25	21.36	22.00	18.23	18.25	18.36	19.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

Reduced Average RF Power (Proximity Sensor active)

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GPRS (GMSK, 1 Tx slot) – CS1	29.03	**29.06**	29.04	29.50	20.03	20.06	20.04	20.50
GPRS (GMSK, 2 Tx slots) – CS1	25.99	26.11	26.05	26.50	19.99	**20.11**	20.05	20.50
GPRS (GMSK, 3 Tx slots) – CS1	24.03	24.13	24.07	24.50	19.77	19.87	19.81	20.24
GPRS (GMSK, 4 Tx slots) – CS1	22.92	23.01	22.93	23.50	19.92	20.01	19.93	20.50
EDGE (8PSK, 1 Tx slot) – MCS5	23.09	23.26	23.47	24.00	14.09	14.26	14.47	15.00
EDGE (8PSK, 2 Tx slots) – MCS5	20.05	20.26	20.44	21.00	14.05	14.26	14.44	15.00
EDGE (8PSK, 3 Tx slots) – MCS5	18.37	18.36	18.62	19.50	14.11	14.10	14.36	15.24
EDGE (8PSK, 4 Tx slots) – MCS5	16.94	17.10	17.22	18.00	13.94	14.10	14.22	15.00
Band GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GPRS (GMSK, 1 Tx slot) – CS1	**17.58**	17.51	17.37	18.00	8.58	8.51	8.37	9.00
GPRS (GMSK, 2 Tx slots) – CS1	17.56	17.50	17.37	18.00	11.56	11.50	11.37	12.00
GPRS (GMSK, 3 Tx slots) – CS1	17.55	17.44	17.35	18.00	13.29	13.18	13.09	13.74
GPRS (GMSK, 4 Tx slots) – CS1	17.53	17.42	17.33	18.00	**14.53**	14.42	14.33	15.00
EDGE (8PSK, 1 Tx slot) – MCS5	13.67	13.78	13.83	14.50	4.67	4.78	4.83	5.50
EDGE (8PSK, 2 Tx slots) – MCS5	13.54	13.63	13.72	14.50	7.54	7.63	7.72	8.50
EDGE (8PSK, 3 Tx slots) – MCS5	13.35	13.48	13.57	14.50	9.09	9.22	9.31	10.24
EDGE (8PSK, 4 Tx slots) – MCS5	13.27	13.30	13.34	14.00	10.27	10.30	10.34	11.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, 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 for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, 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 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.
6. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

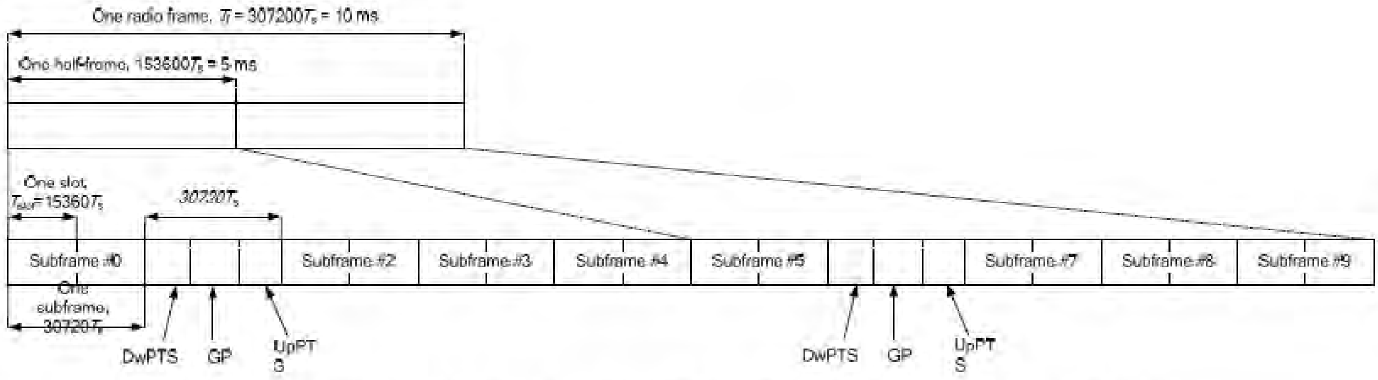


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: 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

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Special subframe ($30720 \cdot T_s$): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~4**	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe($30720 \cdot T_s$): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~3**	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.

ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink

iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.167)/5 = 63.3%

iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.143)/5 = 62.9%

v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

Maximum Average RF Power (Proximity Sensor Inactive)

<LTE Band 41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				40240	40690	41140		
Frequency (MHz)				2555	2600	2645		
20	QPSK	1	0	21.54	21.67	21.27	22.5	0
20	QPSK	1	49	21.62	21.72	21.35		
20	QPSK	1	99	21.71	**21.85**	21.40		
20	QPSK	50	0	20.46	20.81	20.46	21.5	0-1
20	QPSK	50	24	20.50	20.85	20.48		
20	QPSK	50	49	20.52	20.87	20.54		
20	QPSK	100	0	20.60	20.78	20.50		
20	16QAM	1	0	20.76	20.69	20.46	21.5	0-1
20	16QAM	1	49	20.60	20.54	20.54		
20	16QAM	1	99	20.45	20.68	20.62		
20	16QAM	50	0	19.81	19.87	19.55	20.5	0-2
20	16QAM	50	24	19.71	19.88	19.59		
20	16QAM	50	49	19.65	19.90	19.65		
20	16QAM	100	0	19.65	19.87	19.57		
Channel				40215	40690	41165	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2552.5	2600	2647.5		
15	QPSK	1	0	21.58	21.26	21.40	22.5	0
15	QPSK	1	37	21.74	21.25	21.52		
15	QPSK	1	74	21.72	21.20	21.46		
15	QPSK	36	0	20.74	20.32	20.53	21.5	0-1
15	QPSK	36	18	20.79	20.33	20.57		
15	QPSK	36	37	20.82	20.31	20.58		
15	QPSK	75	0	20.77	20.35	20.54		
15	16QAM	1	0	20.73	20.43	20.49	21.5	0-1
15	16QAM	1	37	20.89	20.42	20.63		
15	16QAM	1	74	20.88	20.40	20.63		
15	16QAM	36	0	19.71	19.34	19.55	20.5	0-2
15	16QAM	36	18	19.79	19.32	19.57		
15	16QAM	36	37	19.79	19.30	19.63		
15	16QAM	75	0	19.86	19.40	19.64		

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				40190	40690	41190		
Frequency (MHz)				2550	2600	2650		
10	QPSK	1	0	21.47	21.36	21.37	22.5	0
10	QPSK	1	24	21.58	21.33	21.49		
10	QPSK	1	49	21.59	21.10	21.40		
10	QPSK	25	0	20.69	20.28	20.53	21.5	0-1
10	QPSK	25	12	20.70	20.31	20.55		
10	QPSK	25	24	20.70	20.30	20.58		
10	QPSK	50	0	20.71	20.29	20.56		
10	16QAM	1	0	20.72	20.45	20.59	21.5	0-1
10	16QAM	1	24	20.84	20.43	20.59		
10	16QAM	1	49	20.86	20.40	20.63		
10	16QAM	25	0	19.74	19.36	19.61	20.5	0-2
10	16QAM	25	12	19.79	19.37	19.67		
10	16QAM	25	24	19.81	19.37	19.68		
10	16QAM	50	0	19.73	19.38	19.66		
Channel				40165	40690	41215	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2547.5	2600	2652.5		
5	QPSK	1	0	21.50	21.35	21.44	22.5	0
5	QPSK	1	12	21.54	21.34	21.52		
5	QPSK	1	24	21.52	21.37	21.39		
5	QPSK	12	0	20.70	20.35	20.62	21.5	0-1
5	QPSK	12	6	20.70	20.32	20.63		
5	QPSK	12	11	20.72	20.29	20.62		
5	QPSK	25	0	20.68	20.27	20.57		
5	16QAM	1	0	20.73	20.42	20.64	21.5	0-1
5	16QAM	1	12	20.77	20.40	20.70		
5	16QAM	1	24	20.77	20.36	20.60		
5	16QAM	12	0	19.74	19.41	19.71	20.5	0-2
5	16QAM	12	6	19.75	19.41	19.71		
5	16QAM	12	11	19.78	19.47	19.70		
5	16QAM	25	0	19.73	19.56	19.68		

Reduced Average RF Power (Proximity Sensor active)

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				40240	40690	41140		
Frequency (MHz)				2555	2600	2645		
20	QPSK	1	0	13.63	13.54	13.43	14.5	0
20	QPSK	1	49	13.66	13.49	13.47		
20	QPSK	1	99	13.90	**13.95**	13.68		
20	QPSK	50	0	13.55	13.57	13.56	14.5	0
20	QPSK	50	24	13.66	13.57	13.54		
20	QPSK	50	49	13.70	13.78	13.57		
20	QPSK	100	0	13.69	13.54	13.51		
20	16QAM	1	0	13.84	13.65	13.72	14.5	0
20	16QAM	1	49	13.76	13.62	13.72		
20	16QAM	1	99	13.65	13.59	13.75		
20	16QAM	50	0	13.80	13.62	13.63	14.5	0
20	16QAM	50	24	13.71	13.55	13.60		
20	16QAM	50	49	13.71	13.54	13.63		
20	16QAM	100	0	13.69	13.60	13.55		
Channel				40215	40690	41165	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2552.5	2600	2647.5		
15	QPSK	1	0	13.70	13.36	13.52	14.5	0
15	QPSK	1	37	13.78	13.39	13.53		
15	QPSK	1	74	13.76	13.38	13.54		
15	QPSK	36	0	13.72	13.37	13.52	14.5	0
15	QPSK	36	18	13.75	13.37	13.54		
15	QPSK	36	37	13.76	13.38	13.54		
15	QPSK	75	0	13.76	13.40	13.57		
15	16QAM	1	0	13.82	13.59	13.72	14.5	0
15	16QAM	1	37	13.89	13.61	13.76		
15	16QAM	1	74	13.83	13.59	13.75		
15	16QAM	36	0	13.73	13.38	13.50	14.5	0
15	16QAM	36	18	13.76	13.39	13.53		
15	16QAM	36	37	13.78	13.39	13.53		
15	16QAM	75	0	13.81	13.44	13.58		

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				40190	40690	41190		
Frequency (MHz)				2550	2600	2650		
10	QPSK	1	0	13.58	13.30	13.45	14.5	0
10	QPSK	1	24	13.62	13.31	13.41		
10	QPSK	1	49	13.65	13.25	13.44		
10	QPSK	25	0	13.68	13.39	13.48	14.5	0
10	QPSK	25	12	13.71	13.37	13.52		
10	QPSK	25	24	13.73	13.38	13.54		
10	QPSK	50	0	13.69	13.35	13.53		
10	16QAM	1	0	13.90	13.63	13.76	14.5	0
10	16QAM	1	24	13.94	13.61	13.75		
10	16QAM	1	49	13.88	13.59	13.73		
10	16QAM	25	0	13.76	13.42	13.53	14.5	0
10	16QAM	25	12	13.78	13.44	13.56		
10	16QAM	25	24	13.81	13.45	13.59		
10	16QAM	50	0	13.77	13.41	13.59		
Channel				40165	40690	41215	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2547.5	2600	2652.5		
5	QPSK	1	0	13.59	13.29	13.48	14.5	0
5	QPSK	1	12	13.65	13.29	13.49		
5	QPSK	1	24	13.58	13.22	13.41		
5	QPSK	12	0	13.73	13.40	13.58	14.5	0
5	QPSK	12	6	13.74	13.39	13.56		
5	QPSK	12	11	13.73	13.38	13.60		
5	QPSK	25	0	13.68	13.38	13.56		
5	16QAM	1	0	13.84	13.57	13.77	14.5	0
5	16QAM	1	12	13.85	13.59	13.73		
5	16QAM	1	24	13.86	13.54	13.71		
5	16QAM	12	0	13.88	13.46	13.64	14.5	0
5	16QAM	12	6	13.78	13.45	13.66		
5	16QAM	12	11	13.81	13.49	13.67		
5	16QAM	25	0	13.76	13.43	13.61		

<WLAN Conducted Power>

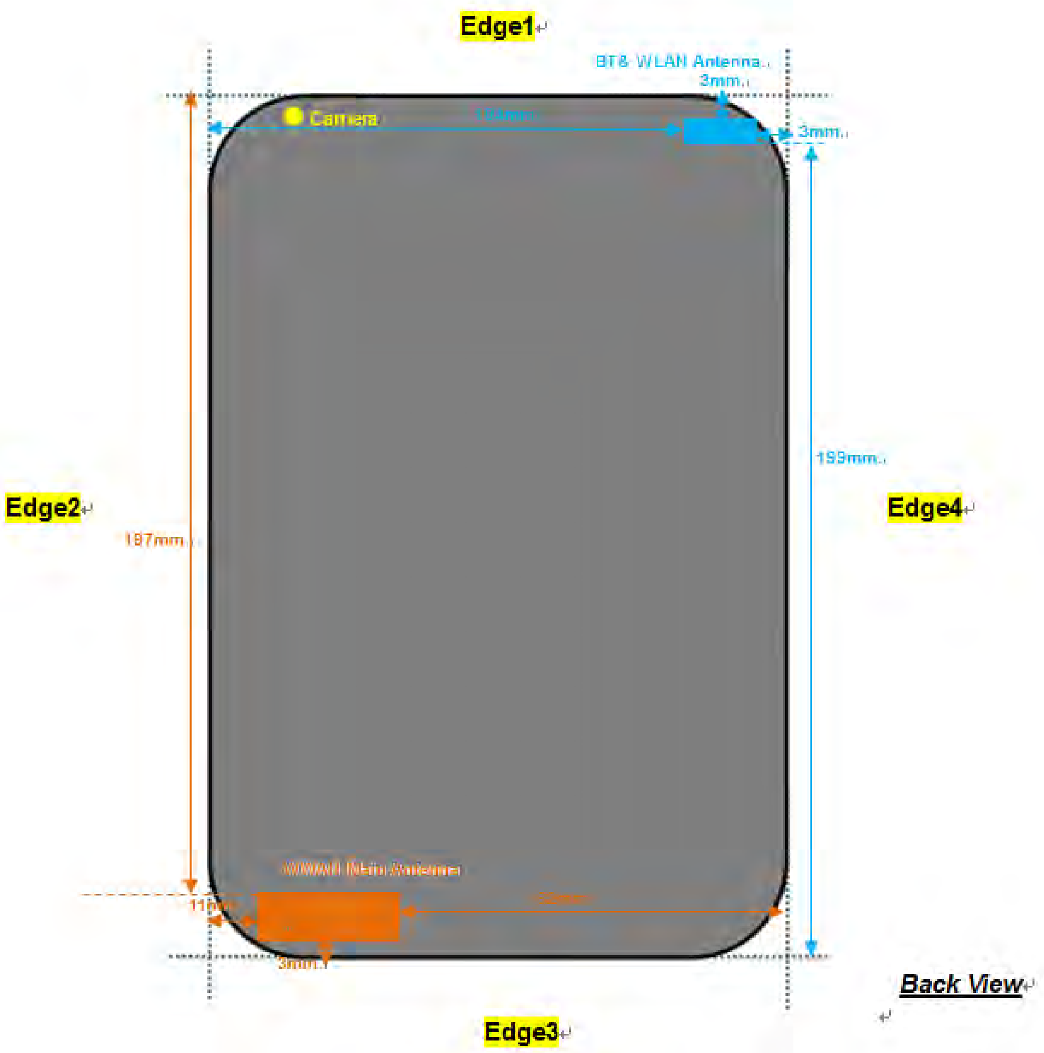
General Note:

1. Per KDB 248227 D01v02r01, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, 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(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<u><2.4GHz WLAN ></u>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Duty Cycle %
2.4GHz WLAN	802.11b	CH 1	2412	1Mbps	13.34	98.13
		CH 6	2437		**13.85**	
		CH 11	2462		13.47	
	802.11g	CH 1	2412	6Mbps	12.47	89.17
		CH 6	2437		**12.83**	
		CH 11	2462		12.56	
	802.11n-HT20	CH 1	2412	MCS0	10.45	87.77
		CH 6	2437		**10.80**	
		CH 11	2462		10.54	

14. Antenna Location



Diagonal Dimension: 241mm

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v05r02, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v05r02, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds 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 and ≤ 7.5 for 10-g extremity SAR
   - 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
6. Per KDB 447498 D01v05r02, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

SAR test exclusion table distance is ≤ 50mm

Exposure Position	Wireless Interface	GPRS 850 4 Tx slots	GPRS 1900 4 Tx slots	TDD LTE Band 41	BT 2.4GHz	WLAN 2.4GHz 802.11b
	Calculated Frequency (MHz)	848.8	1909.8	2652.5	2480	2462
	Tune-up Maximum power (dBm)	26.5	23.0	22.5	5.0	14.0
Bottom Face	Antenna to user (mm)	5			5	
	SAR exclusion threshold	82.3	55.3	58.4	0.9	7.9
	SAR testing required?	**Yes**	**Yes**	**Yes**	**No**	**Yes**
Edge 1	Antenna to user (mm)				3	
	SAR exclusion threshold				0.9	7.9
	SAR testing required?				**No**	**Yes**
Edge 2	Antenna to user (mm)	11				
	SAR exclusion threshold	37.4	25.1	26.5		
	SAR testing required?	**Yes**	**Yes**	**Yes**		
Edge 3	Antenna to user (mm)	3				
	SAR exclusion threshold	82.3	55.3	58.4		
	SAR testing required?	**Yes**	**Yes**	**Yes**		
Edge 4	Antenna to user (mm)				3	
	SAR exclusion threshold				0.9	7.9
	SAR testing required?				**No**	**Yes**

SAR test exclusion table distance is >50mm

Exposure Position	Wireless Interface	GPRS 850 4 Tx slots	GPRS 1900 4 Tx slots	TDD LTE Band 41	BT 2.4GHz	WLAN 2.4GHz 802.11b
	Calculated Frequency (MHz)	848.8	1909.8	2652.5	2480	2462
	Tune-up Maximum power (dBm)	26.5	23.0	22.5	5.0	14.0
	Tune-up Maximum rated power (mW)	447.0	200.0	178.0	3.0	25.0
Edge 1	Antenna to user (mm)	197				
	SAR exclusion threshold	994.0	1579.0	1561.0		
	SAR testing required?	No	No	No		
Edge 2	Antenna to user (mm)				104	
	SAR exclusion threshold				635.0	636.0
	SAR testing required?				No	No
Edge 3	Antenna to user (mm)				199	
	SAR exclusion threshold				1585.0	1586.0
	SAR testing required?				No	No
Edge 4	Antenna to user (mm)	82				
	SAR exclusion threshold	344.0	429.0	411.0		
	SAR testing required?	**Yes**	No	No		

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. Duty cycle of TDD was fixed, therefore not require scaled to 100% of duty cycle. For SAR system, the crest factor 1:1.59 (62.9%) was used perform testing. Considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result.
   c. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   e. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   f. For TDD LTE Band: Reported SAR(W/kg)= Measured SAR(W/kg)* scaling factor for extended cyclic prefix * Tune-up scaling factor
2. Per KDB 447498 D01v05r02, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 1.0cm for bottom face and 0.8cm for edge 3.
4. Considering the curvature transition from bottom face to the edge, SAR testing at the curvature was performed. The SAR test setup is included in test setup photo exhibit, and the details of the curvature are included in operation description exhibit.
5. For SAR testing of the curved region of the device, the device was placed directly against the phantom at the point where the distance between the antenna and device exterior is a minimum.
6. Curved region diagram of the device according to the test setup photo (exterior radius dimension), for WWAN, X=1.40mm, Y=3.07mm, Z=1.37mm, X>Z, Y>Z, Per KDB 616217 D04v01r01, curved SAR evaluation is required. More detail information please refer to the setup photo.
7. For SAR testing of the curved region of the device, the device was placed directly against the phantom at the point where the distance between the antenna and device exterior is a minimum.
8. Per KDB 941225 D01v03, considering the possibility of e.g. 3rd party VoIP operation for Head and body-worn SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900.
9. Per KDB 941225 D05v02r03, 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 for RB offsets at the upper edge, middle and lower edge of each required test channel.
10. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
11. Per KDB 941225 D05v02r03, 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 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.
12. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
13. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.
14. Per KDB 248227 D01v02r01, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

15. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
16. For all positions / configurations, 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(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
17. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
18. Additional WLAN SAR Test Position of bottom Face 10mm testing was performed for simultaneous transmission analysis.

15.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS(4 Tx slots)	Right Cheek	Off	189	836.4	28.89	29.50	1.151	-0.01	0.047	0.054
#01	**GSM850**	**GPRS(4 Tx slots)**	**Right Tilted**	**Off**	**189**	**836.4**	**28.89**	**29.50**	**1.151**	**-0.06**	**0.063**	**0.073**
	GSM850	GPRS(4 Tx slots)	Left Cheek	Off	189	836.4	28.89	29.50	1.151	0.15	0.045	0.052
	GSM850	GPRS(4 Tx slots)	Left Tilted	Off	189	836.4	28.89	29.50	1.151	-0.07	0.049	0.056
#02	**GSM1900**	**GPRS(4 Tx slots)**	**Right Cheek**	**Off**	**512**	**1850.2**	**25.39**	**26.00**	**1.151**	**0.04**	**0.099**	**0.114**
	GSM1900	GPRS(4 Tx slots)	Right Tilted	Off	512	1850.2	25.39	26.00	1.151	-0.04	0.052	0.060
	GSM1900	GPRS(4 Tx slots)	Left Cheek	Off	512	1850.2	25.39	26.00	1.151	0.07	0.079	0.091
	GSM1900	GPRS(4 Tx slots)	Left Tilted	Off	512	1850.2	25.39	26.00	1.151	0.09	0.069	0.079

<LTE SAR>

Plot No.	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#03	**TDD LTE Band 41**	**20M**	**1**	**99**	**QPSK**	**Right Cheek**	**Off**	**40690**	**2600**	**21.85**	**22.50**	**1.161**	**62.9**	**1.006**	**0.03**	**0.047**	**0.055**
	TDD LTE Band 41	20M	1	99	QPSK	Right Tilted	Off	40690	2600	21.85	22.50	1.161	62.9	1.006	0.04	0.041	0.048
	TDD LTE Band 41	20M	1	99	QPSK	Left Cheek	Off	40690	2600	21.85	22.50	1.161	62.9	1.006	0.11	0.034	0.040
	TDD LTE Band 41	20M	1	99	QPSK	Left Tilted	Off	40690	2600	21.85	22.50	1.161	62.9	1.006	0.01	0.03	0.035
	TDD LTE Band 41	20M	50	49	QPSK	Right Cheek	Off	40690	2600	20.87	21.50	1.161	62.9	1.006	0.18	0.034	0.040
	TDD LTE Band 41	20M	50	49	QPSK	Right Tilted	Off	40690	2600	20.87	21.50	1.161	62.9	1.006	0.03	0.044	0.051
	TDD LTE Band 41	20M	50	49	QPSK	Left Cheek	Off	40690	2600	20.87	21.50	1.161	62.9	1.006	0.1	0.029	0.034
	TDD LTE Band 41	20M	50	49	QPSK	Left Tilted	Off	40690	2600	20.87	21.50	1.161	62.9	1.006	0.05	0.021	0.025

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#04	**WLAN 2.4GHz**	**802.11b 1Mbps**	**Right Cheek**	**6**	**2437**	**13.85**	**14.00**	**1.035**	**98.13**	**1.019**	**0.03**	**0.378**	**0.399**
	WLAN 2.4GHz	802.11b 1Mbps	Right Tilted	6	2437	13.85	14.00	1.035	98.13	1.019	0.12	0.213	0.225
	WLAN 2.4GHz	802.11b 1Mbps	Left Cheek	6	2437	13.85	14.00	1.035	98.13	1.019	0.14	0.148	0.156
	WLAN 2.4GHz	802.11b 1Mbps	Left Tilted	6	2437	13.85	14.00	1.035	98.13	1.019	0.02	0.090	0.095

15.2 Body SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS(4 Tx slots)	Bottom Face	0	On	189	836.4	23.01	23.50	1.119	-0.05	0.993	1.112
	GSM850	GPRS(4 Tx slots)	Edge 3	0	On	189	836.4	23.01	23.50	1.119	0.09	0.617	0.691
	GSM850	GPRS(4 Tx slots)	Curved surface of Edge 3	0	On	189	836.4	23.01	23.50	1.119	-0.06	0.807	0.903
	GSM850	GPRS(4 Tx slots)	Bottom Face	0	On	128	824.2	22.92	23.50	1.143	0.15	0.956	1.093
#05	**GSM850**	**GPRS(4 Tx slots)**	**Bottom Face**	**0**	**On**	**251**	**848.8**	**22.93**	**23.50**	**1.140**	**-0.04**	**1.010**	**1.152**
	GSM850	GPRS(4 Tx slots)	Curved surface of Edge 3	0	On	128	824.2	22.92	23.50	1.143	-0.06	0.815	0.931
	GSM850	GPRS(4 Tx slots)	Curved surface of Edge 3	0	On	251	848.8	22.93	23.50	1.140	0.08	0.761	0.868
	GSM850	GPRS(4 Tx slots)	Bottom Face	10	Off	189	836.4	28.89	29.50	1.151	-0.14	0.645	0.742
	GSM850	GPRS(4 Tx slots)	Edge 2	0	Off	189	836.4	28.89	29.50	1.151	-0.08	0.241	0.277
	GSM850	GPRS(4 Tx slots)	Edge 3	8	Off	189	836.4	28.89	29.50	1.151	-0.07	0.469	0.540
	GSM850	GPRS(4 Tx slots)	Edge 4	0	Off	189	836.4	28.89	29.50	1.151	-0.08	0.033	0.038
	GSM1900	GPRS(4 Tx slots)	Bottom Face	0	On	512	1850.2	17.53	18.00	1.114	0.05	0.729	0.812
	GSM1900	GPRS(4 Tx slots)	Edge 3	0	On	512	1850.2	17.53	18.00	1.114	0.05	0.355	0.396
	GSM1900	GPRS(4 Tx slots)	Curved surface of Edge 3	0	On	512	1850.2	17.53	18.00	1.114	0.16	0.729	0.812
	GSM1900	GPRS(4 Tx slots)	Bottom Face	0	On	661	1880	17.42	18.00	1.143	-0.01	0.734	0.839
	GSM1900	GPRS(4 Tx slots)	Bottom Face	0	On	810	1909.8	17.33	18.00	1.167	0.04	0.739	0.862
	GSM1900	GPRS(4 Tx slots)	Curved surface of Edge 3	0	On	661	1880	17.42	18.00	1.143	-0.01	0.738	0.843
	GSM1900	GPRS(4 Tx slots)	Curved surface of Edge 3	0	On	810	1909.8	17.33	18.00	1.167	0.06	0.709	0.827
	GSM1900	GPRS(4 Tx slots)	Bottom Face	10	Off	512	1850.2	25.39	26.00	1.151	0.06	0.858	0.987
	GSM1900	GPRS(4 Tx slots)	Edge 2	0	Off	512	1850.2	25.39	26.00	1.151	-0.03	0.590	0.679
	GSM1900	GPRS(4 Tx slots)	Edge 3	8	Off	512	1850.2	25.39	26.00	1.151	-0.03	0.462	0.532
	GSM1900	GPRS(4 Tx slots)	Bottom Face	10	Off	661	1880	25.38	26.00	1.153	-0.16	0.907	1.046
#06	**GSM1900**	**GPRS(4 Tx slots)**	**Bottom Face**	**10**	**Off**	**810**	**1909.8**	**25.34**	**26.00**	**1.164**	**0.15**	**0.905**	**1.054**

<LTE SAR>

Plot No.	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (mm)	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	TDD LTE Band 41	20M	1	99	QPSK	Bottom Face	0	On	40690	2600	13.95	14.50	1.135	62.9	1.006	0.07	0.754	0.861
	TDD LTE Band 41	20M	1	99	QPSK	Edge 3	0	On	40690	2600	13.95	14.50	1.135	62.9	1.006	-0.01	0.616	0.703
	TDD LTE Band 41	20M	1	99	QPSK	Curved surface of Edge 3	0	On	40690	2600	13.95	14.50	1.135	62.9	1.006	0.07	0.896	1.023
	TDD LTE Band 41	20M	1	99	QPSK	Bottom Face	0	On	40240	2555	13.90	14.50	1.148	62.9	1.006	-0.09	0.763	0.881
	TDD LTE Band 41	20M	1	99	QPSK	Bottom Face	0	On	41140	2645	13.68	14.50	1.208	62.9	1.006	0.06	0.657	0.798
	TDD LTE Band 41	20M	1	99	QPSK	Edge 3	0	On	40240	2555	13.90	14.50	1.148	62.9	1.006	-0.08	0.523	0.604
	TDD LTE Band 41	20M	1	99	QPSK	Edge 3	0	On	41140	2645	13.68	14.50	1.208	62.9	1.006	-0.13	0.557	0.677
	TDD LTE Band 41	20M	1	99	QPSK	Curved surface of Edge 3	0	On	40240	2555	13.90	14.50	1.148	62.9	1.006	0.14	0.923	1.066
	TDD LTE Band 41	20M	1	99	QPSK	Curved surface of Edge 3	0	On	41140	2645	13.68	14.50	1.208	62.9	1.006	0.08	0.951	1.156
	TDD LTE Band 41	20M	1	99	QPSK	Bottom Face	10	Off	40690	2600	21.85	22.50	1.161	62.9	1.006	0.12	0.601	0.702
	TDD LTE Band 41	20M	1	99	QPSK	Edge 2	0	Off	40690	2600	21.85	22.50	1.161	62.9	1.006	-0.04	0.441	0.515
	TDD LTE Band 41	20M	1	99	QPSK	Edge 3	8	Off	40690	2600	21.85	22.50	1.161	62.9	1.006	0.03	0.938	1.096
	TDD LTE Band 41	20M	1	99	QPSK	Bottom Face	10	Off	40240	2555	21.71	22.50	1.199	62.9	1.006	-0.01	0.499	0.602
	TDD LTE Band 41	20M	1	99	QPSK	Bottom Face	10	Off	41140	2645	21.40	22.50	1.288	62.9	1.006	0.02	0.485	0.629
	TDD LTE Band 41	20M	1	99	QPSK	Edge 3	8	Off	40240	2555	21.71	22.50	1.199	62.9	1.006	0.09	0.649	0.783
	TDD LTE Band 41	20M	1	99	QPSK	Edge 3	8	Off	41140	2645	21.40	22.50	1.288	62.9	1.006	-0.08	0.813	1.054
	TDD LTE Band 41	20M	50	49	QPSK	Bottom Face	0	On	40690	2600	13.78	14.50	1.180	62.9	1.006	0.06	0.694	0.824
	TDD LTE Band 41	20M	50	49	QPSK	Edge 3	0	On	40690	2600	13.78	14.50	1.180	62.9	1.006	-0.03	0.591	0.702
	TDD LTE Band 41	20M	50	49	QPSK	Curved surface of Edge 3	0	On	40690	2600	13.78	14.50	1.180	62.9	1.006	0.08	0.929	1.103
	TDD LTE Band 41	20M	50	49	QPSK	Bottom Face	0	On	40240	2555	13.70	14.50	1.202	62.9	1.006	-0.13	0.787	0.952
	TDD LTE Band 41	20M	50	49	QPSK	Bottom Face	0	On	41140	2645	13.57	14.50	1.239	62.9	1.006	-0.03	0.693	0.864
	TDD LTE Band 41	20M	50	49	QPSK	Edge 3	0	On	40240	2555	13.70	14.50	1.202	62.9	1.006	-0.04	0.516	0.624
	TDD LTE Band 41	20M	50	49	QPSK	Edge 3	0	On	41140	2645	13.57	14.50	1.239	62.9	1.006	-0.01	0.56	0.698
	TDD LTE Band 41	20M	50	49	QPSK	Curved surface of Edge 3	0	On	40240	2555	13.70	14.50	1.202	62.9	1.006	0.04	0.941	1.138
#07	**TDD LTE Band 41**	**20M**	**50**	**49**	**QPSK**	**Curved surface of Edge 3**	**0**	**On**	**41140**	**2645**	**13.57**	**14.50**	**1.239**	**62.9**	**1.006**	**0.08**	**0.963**	**1.200**
	TDD LTE Band 41	20M	50	49	QPSK	Bottom Face	10	Off	40690	2600	20.87	21.50	1.156	62.9	1.006	0.04	0.492	0.572
	TDD LTE Band 41	20M	50	49	QPSK	Edge 2	0	Off	40690	2600	20.87	21.50	1.156	62.9	1.006	-0.11	0.354	0.412
	TDD LTE Band 41	20M	50	49	QPSK	Edge 3	8	Off	40690	2600	20.87	21.50	1.156	62.9	1.006	-0.07	0.647	0.752
	TDD LTE Band 41	20M	50	49	QPSK	Edge 3	8	Off	40240	2555	20.52	21.50	1.156	62.9	1.006	-0.08	0.767	0.892
	TDD LTE Band 41	20M	50	49	QPSK	Edge 3	8	Off	41140	2645	20.54	21.50	1.156	62.9	1.006	0.12	0.703	0.818
	TDD LTE Band 41	20M	100	0	QPSK	Bottom Face	0	On	40690	2600	13.54	14.50	1.247	62.9	1.006	0.05	0.592	0.743
	TDD LTE Band 41	20M	100	0	QPSK	Edge 3	0	On	40690	2600	13.54	14.50	1.247	62.9	1.006	-0.04	0.492	0.617
	TDD LTE Band 41	20M	100	0	QPSK	Curved surface of Edge 3	0	On	40690	2600	13.54	14.50	1.247	62.9	1.006	0.18	0.871	1.093
	TDD LTE Band 41	20M	100	0	QPSK	Bottom Face	10	Off	40690	2600	20.78	21.50	1.180	62.9	1.006	-0.03	0.465	0.552
	TDD LTE Band 41	20M	100	0	QPSK	Edge 3	8	Off	40690	2600	20.78	21.50	1.180	62.9	1.006	0.03	0.593	0.704

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	0	6	2437	13.85	14.00	1.035	98.13	1.019	-0.08	1.040	1.097
	WLAN 2.4GHz	802.11b 1Mbps	Edge 1	0	6	2437	13.85	14.00	1.035	98.13	1.019	-0.08	0.541	0.571
	WLAN 2.4GHz	802.11b 1Mbps	Edge 4	0	6	2437	13.85	14.00	1.035	98.13	1.019	-0.02	0.273	0.288
	WLAN 2.4GHz	802.11b 1Mbps	Bottom Face	10	6	2437	13.85	14.00	1.035	98.13	1.019	0.11	0.121	0.128
#08	**WLAN 2.4GHz**	**802.11b 1Mbps**	**Bottom Face**	**0**	**11**	**2462**	**13.47**	**14.00**	**1.129**	**98.13**	**1.019**	**-0.04**	**1.000**	**1.151**

15.3 Repeated SAR Measurement

Plot No.	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (mm)	Power Back-off	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	GSM850	GPRS (4 Tx slots)	-	-	-	Bottom Face	0	On	251	848.8	22.93	23.50	1.140	100	1.000	-0.04	1.010	1	1.152
2nd	GSM850	GPRS (4 Tx slots)	-	-	-	Bottom Face	0	On	251	848.8	22.93	23.50	1.140	100	1.000	-0.09	0.969	1.043	1.105
1st	GSM1900	GPRS (4 Tx slots)	-	-	-	Bottom Face	10	Off	661	1880	25.38	26.00	1.153	100	1.000	-0.16	0.907	1	1.046
2nd	GSM1900	GPRS (4 Tx slots)	-	-	-	Bottom Face	10	Off	661	1880	25.38	26.00	1.153	100	1.000	0.05	0.895	1.014	1.032
1st	TDD LTE Band 41	QPSK	20M	50	49	Bottom Face Curved surface of Edge3	0	On	41140	2645	13.57	14.50	1.239	62.9	1.006	0.08	0.963	1	1.200
2nd	TDD LTE Band 41	QPSK	20M	50	49	Bottom Face Curved surface of Edge3	0	On	41140	2645	13.57	14.50	1.239	62.9	1.006	-0.05	0.910	1.058	1.134
1st	WLAN 2.4GHz	802.11b 1Mbps	-	-	-	Bottom Face	0	-	6	2437	13.85	14.00	1.035	98.13	1.019	-0.08	1.040	1	1.097
2nd	WLAN 2.4GHz	802.11b 1Mbps	-	-	-	Bottom Face	0	-	6	2437	13.85	14.00	1.035	98.13	1.019	-0.09	1.020	1.020	1.076

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations			Note
		Head	Body	
1.	GPRS/EDGE(Data) + WLAN2.4GHz(data)	Yes	Yes	Hotspot
2.	LTE(Data) + WLAN2.4GHz(data)	Yes	Yes	Hotspot
3.	GPRS/EDGE(Data) + Bluetooth(data)		Yes	WWAN VoIP
4.	LTE(Data) + Bluetooth(data)		Yes	WWAN VoIP

General Note:

1. This device supported VoIP in GPRS, EGPRS, WCDMA, LTE (e.g. 3rd party VoIP).
2. EUT will choose each GSM and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 16.2.
6. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05r02 based on the formula below.
   i) (*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, and *x* = 18.75 for 10-g SAR.
   ii) When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
   iii) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.
   iv) Bluetooth estimated SAR is conservatively determined by 5mm separation, for all applicable exposure positions.

Bluetooth Max Power	Exposure Position	All Positions
5.0 dBm	Estimated SAR (W/kg)	0.126 W/kg

16.1 Head Exposure Conditions

<WWAN + WLAN >

WWAN Band		Exposure Position	WWAN Max. WWAN SAR (W/kg)	WLAN Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Right Cheek	0.054	0.399	0.45		
		Right Tilted	0.073	0.225	0.30		
		Left Cheek	0.052	0.156	0.21		
		Left Tilted	0.056	0.095	0.15		
	GSM1900	Right Cheek	0.114	0.399	**0.51**		
		Right Tilted	0.060	0.225	0.29		
		Left Cheek	0.091	0.156	0.25		
		Left Tilted	0.079	0.095	0.17		
LTE	Band 41	Right Cheek	0.055	0.399	0.45		
		Right Tilted	0.051	0.225	0.28		
		Left Cheek	0.040	0.156	0.20		
		Left Tilted	0.035	0.095	0.13		

16.2 Body Exposure Conditions

<WWAN + WLAN >

WWAN Band		Exposure Position	WWAN Max. WWAN SAR (W/kg)	WLAN Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Bottom Face at 0cm	1.152	1.151	**2.30**	**0.02**	**#01**
		Bottom Face at 1cm	0.742	0.128	0.87		
		Edge1 at 0cm		0.571	0.57		
		Edge2 at 0cm	0.277		0.28		
		Edge3 at 0cm	0.691		0.69		
		Edge3 at 0.8cm	0.540		0.54		
		Edge4 at 0cm	0.038	0.288	0.33		
		Bottom Face Curved surface of Edge3 at 0cm	0.931		0.93		
	GSM1900	Bottom Face at 0cm	0.862	1.151	**2.01**	**0.02**	**#02**
		Bottom Face at 1cm	1.054	0.128	1.18		
		Edge1 at 0cm		0.571	0.57		
		Edge2 at 0cm	0.679		0.68		
		Edge3 at 0cm	0.396		0.40		
		Edge3 at 0.8cm	0.532		0.53		
		Edge4 at 0cm		0.288	0.29		
		Bottom Face Curved surface of Edge3 at 0cm	0.843		0.84		
LTE	Band 41	Bottom Face at 0cm	0.952	1.151	**2.10**	**0.03**	**#03**
		Bottom Face at 1cm	0.702	0.128	0.83		
		Edge1 at 0cm		0.571	0.57		
		Edge2 at 0cm	0.515		0.52		
		Edge3 at 0cm	0.703		0.70		
		Edge3 at 0.8cm	1.096		1.10		
		Edge4 at 0cm		0.288	0.29		
		Bottom Face Curved surface of Edge3 at 0cm	1.200		**1.20**		

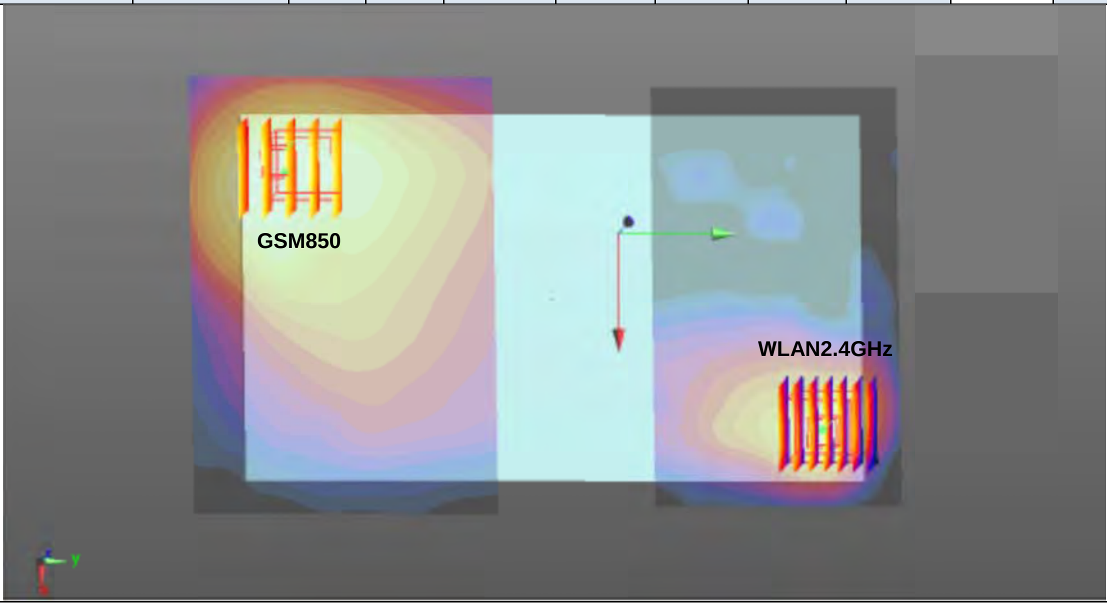
<WWAN + Bluetooth>

WWAN Band		Exposure Position	WWAN Max. WWAN SAR (W/kg)	Bluetooth Estimated Bluetooth SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Bottom Face at 0cm	1.152	0.126	1.28		
		Bottom Face at 1cm	0.742	0.126	0.87		
		Edge1 at 0cm		0.126	0.13		
		Edge2 at 0cm	0.277	0.126	0.40		
		Edge3 at 0cm	0.691	0.126	0.82		
		Edge3 at 0.8cm	0.540	0.126	0.67		
		Edge4 at 0cm	0.038	0.126	0.16		
		Bottom Face Curved surface of Edge3 at 0cm	0.931	0.126	1.06		
	GSM1900	Bottom Face at 0cm	0.862	0.126	0.99		
		Bottom Face at 1cm	1.054	0.126	1.18		
		Edge1 at 0cm		0.126	0.13		
		Edge2 at 0cm	0.679	0.126	0.81		
		Edge3 at 0cm	0.396	0.126	0.52		
		Edge3 at 0.8cm	0.532	0.126	0.66		
		Edge4 at 0cm		0.126	0.13		
		Bottom Face Curved surface of Edge3 at 0cm	0.843	0.126	0.97		
LTE	Band 41	Bottom Face at 0cm	0.952	0.126	1.08		
		Bottom Face at 1cm	0.702	0.126	0.83		
		Edge1 at 0cm		0.126	0.13		
		Edge2 at 0cm	0.515	0.126	0.64		
		Edge3 at 0cm	0.703	0.126	0.83		
		Edge3 at 0.8cm	1.096	0.126	1.22		
		Edge4 at 0cm		0.126	0.13		
		Bottom Face Curved surface of Edge3 at 0cm	1.200	0.126	1.33		

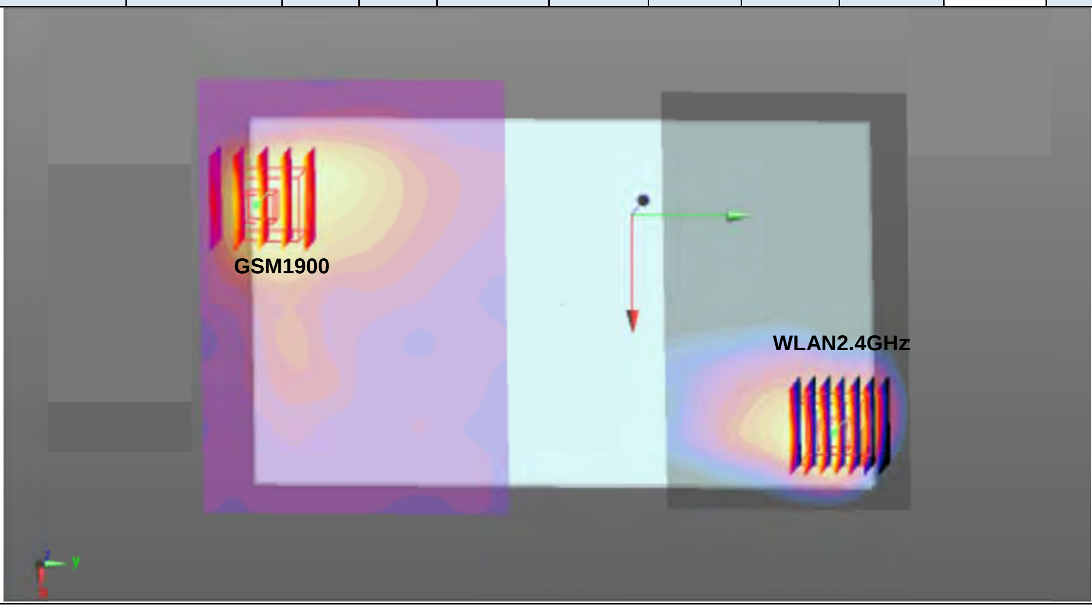
16.3 SPLSR Evaluation and Analysis

General Note:
SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary

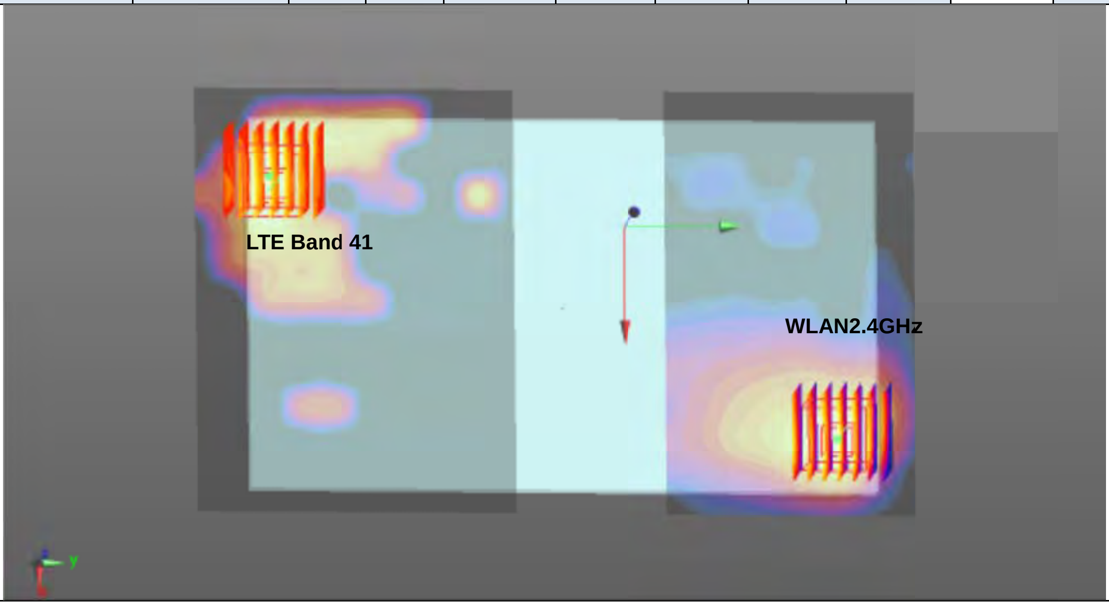
Case 1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	SAR peak location (m) Y	SAR peak location (m) Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850	Bottom Face	1.152	0	-0.05	-0.092	-0.181	167.6	2.30	0.02	Not required
	WLAN2.4GHz		1.151	0	0.0456	0.0456	-0.181				



Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	SAR peak location (m) Y	SAR peak location (m) Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM1900	Bottom Face	0.862	0	-0.0315	-0.106	-0.181	170.1	2.01	0.02	Not required
	WLAN2.4GHz		1.151	0	0.0456	0.0456	-0.181				



Case 3	Band	Position	SAR (W/kg)	Gap	SAR peak location (m)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
	LTE Band 41	Bottom Face	0.952	0	-0.037	-0.037	-0.181	116.8	2.10	0.03	Not required
	WLAN2.4GHz		1.151	0	0.0456	0.0456	-0.181				



Test Engineer： Luke Lu

17. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 17.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.0	N	1	1	1	6.0	6.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.0	R	1.732	1	1	0.6	0.6
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	2.9	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.1	R	1.732	1	1	3.5	3.5
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.4%	11.4%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						22.9%	22.7%

Table 17.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r01, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Jun 2015.

[6] FCC KDB 447498 D01 v05r02, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Feb 2014

[7] FCC KDB 648474 D04 v01r02, “SAR Evaluation Considerations for Wireless Handsets”, Dec 2013.

[8] FCC KDB 941225 D01 v03, “3G SAR MEAUREMENT PROCEDURES”, Oct 2014

[9] FCC KDB 941225 D05 v02r03, “SAR Evaluation Considerations for LTE Devices”, Dec 2013

[10] FCC KDB 616217 D04 v01r01, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, May 2013

[11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[12] FCC KDB 865664 D02 v01r01, “RF Exposure Compliance Reporting and Documentation Considerations” May 2013.

Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Head_835MHz_150903

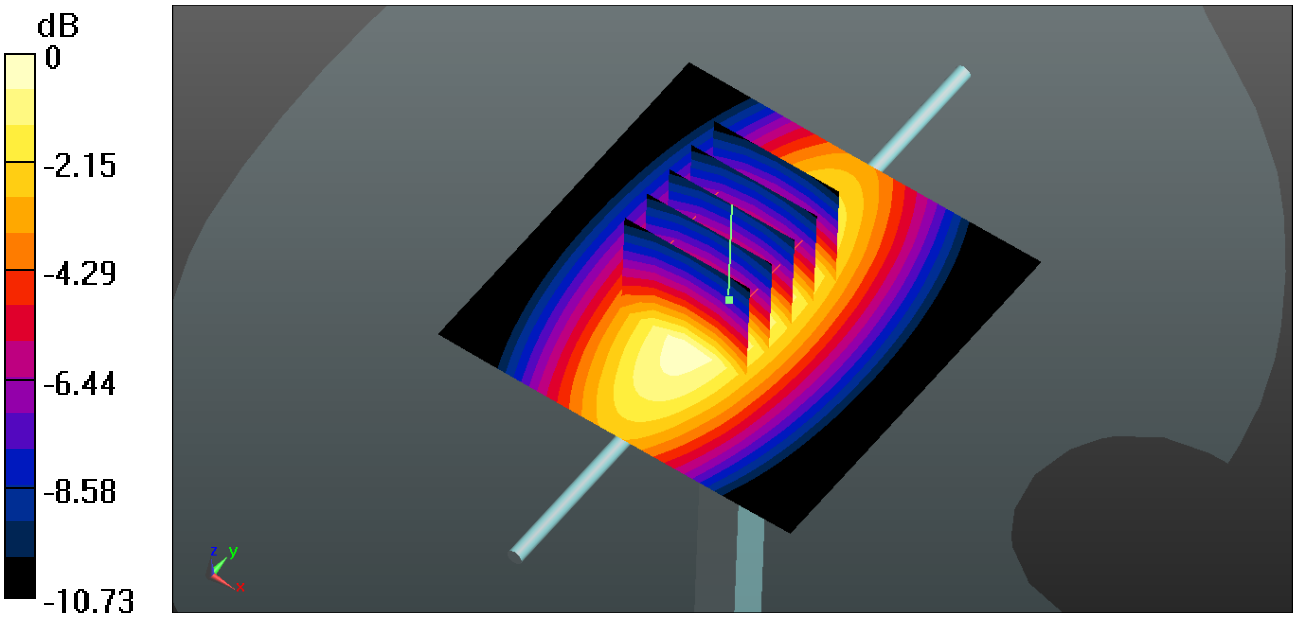
DUT: D835V2-SN:4d091

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835_150903 Medium parameters used: f = 835 MHz; σ = 0.927 S/m; ε_r = 42.674; ρ = 1000 kg/m^3
Ambient Temperature: 23.3 ℃ ; **Liquid Temperature**: 22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(9.48, 9.48, 9.48); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.35 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 61.36 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.91 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.63 W/kg
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.35 W/kg

System Check_Head_1900MHz_150901

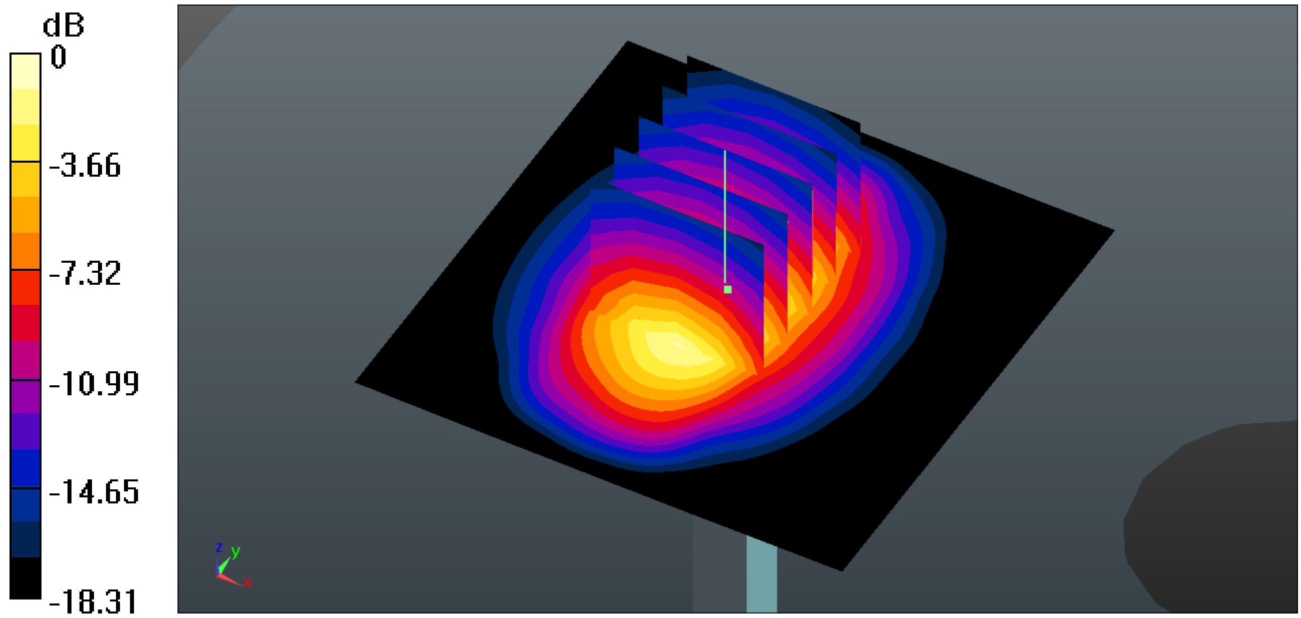
DUT: D1900V2-SN: 5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900_150901 Medium parameters used: f = 1900 MHz; σ = 1.417 S/m; ε_r = 40.994; ρ = 1000 kg/m^3
Ambient Temperature: 23.2 ℃ ; **Liquid Temperature**: 22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.66, 7.66, 7.66); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.4 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 95.62 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 17.0 W/kg
SAR(1 g) = 9.3 W/kg; SAR(10 g) = 4.84 W/kg
Maximum value of SAR (measured) = 13.2 W/kg



0 dB = 13.4 W/kg

Test Laboratory:Sporton International Inc SAR Testing Lab Date: 2015.09.04

System Check_Head_2450MHz_150904

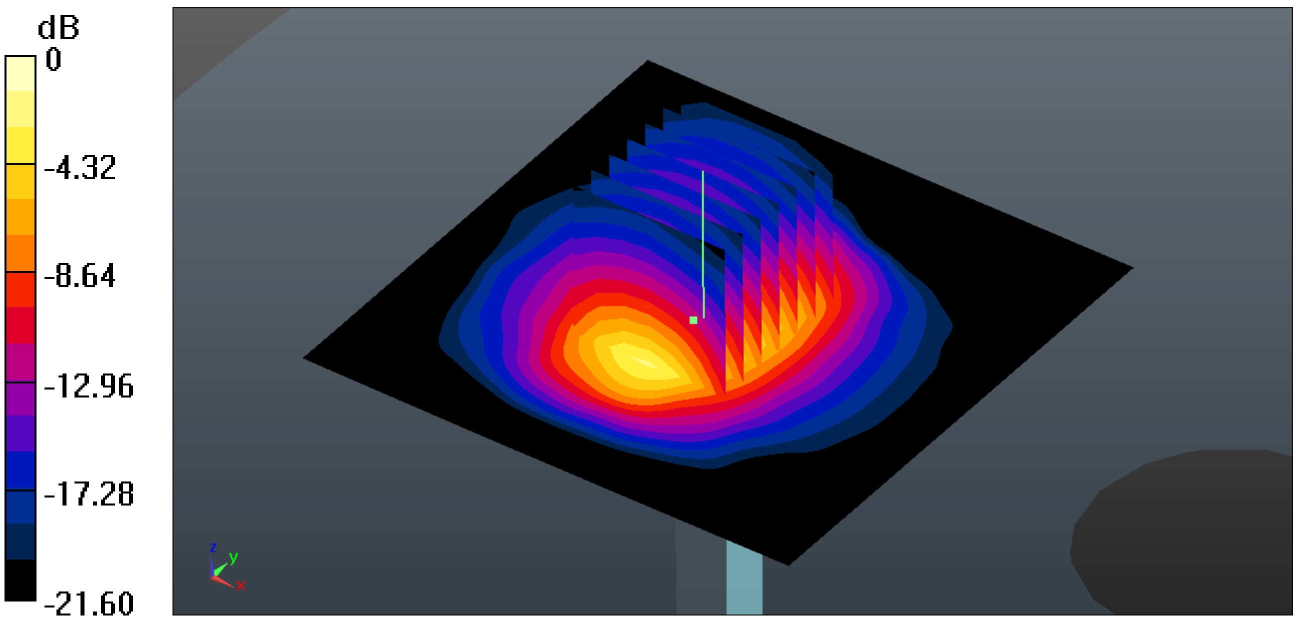
DUT: D2450V2-SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450_150904 Medium parameters used: f = 2450 MHz; σ = 1.861 S/m; ε_r = 39.575; ρ = 1000 kg/m^3
Ambient Temperature: 23.6 ℃ ; **Liquid Temperature**: 22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.01, 7.01, 7.01); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 20.6 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.52 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 28.1 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.22 W/kg
Maximum value of SAR (measured) = 20.6 W/kg



0 dB = 20.6 W/kg

System Check_Head_2600MHz_150903

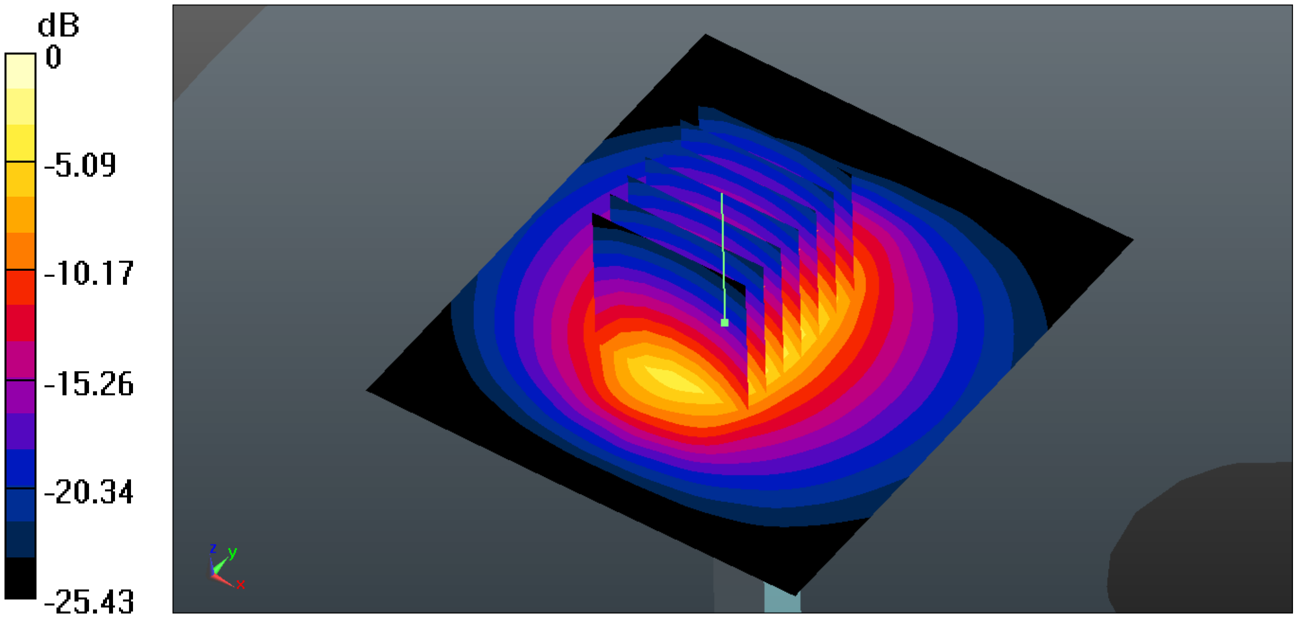
DUT: D2600V2-SN:1061

Communication System: UID 0, CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: HSL_2600_150903 Medium parameters used: f = 2600 MHz; σ = 2.053 S/m; ε_r = 37.984; ρ = 1000 kg/m^3
Ambient Temperature: 23.3 ℃ ; **Liquid Temperature**: 22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(6.92, 6.92, 6.92); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x81x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 26.2 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.2 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 36.4 W/kg
SAR(1 g) = 14.53 W/kg; SAR(10 g) = 6.68 W/kg
Maximum value of SAR (measured) = 25.6 W/kg



0 dB = 25.6 W/kg

Test Laboratory:Sporton International Inc SAR Testing Lab Date: 2015.09.03

System Check_Body_835MHz_150903

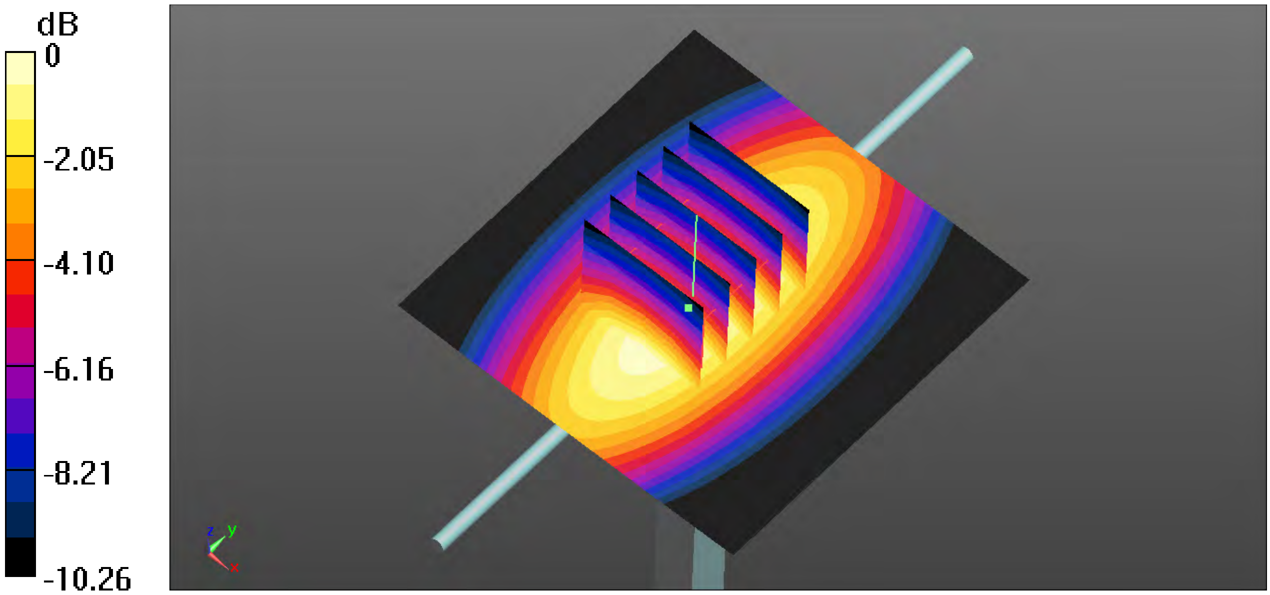
DUT: D835V2-SN:4d091

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_150903 Medium parameters used: f = 835 MHz; σ = 0.998 S/m; ε_r = 54.379; ρ = 1000 kg/m^3
Ambient Temperature: 23.5 ℃ ; **Liquid Temperature**: 22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3898; ConvF(9.97, 9.97, 9.97); Calibrated: 2015.08.06;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1386; Calibrated: 2015.02.19
- Phantom: SAM2; Type: QDOVA001BB; Serial: TP:1233
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.43 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.60 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 4.68 W/kg
SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.81 W/kg
Maximum value of SAR (measured) = 3.41 W/kg



0 dB = 3.43 W/kg

Test Laboratory:Sporton International Inc SAR Testing Lab Date: 2015.09.03

System Check_Body_1900MHz_150903

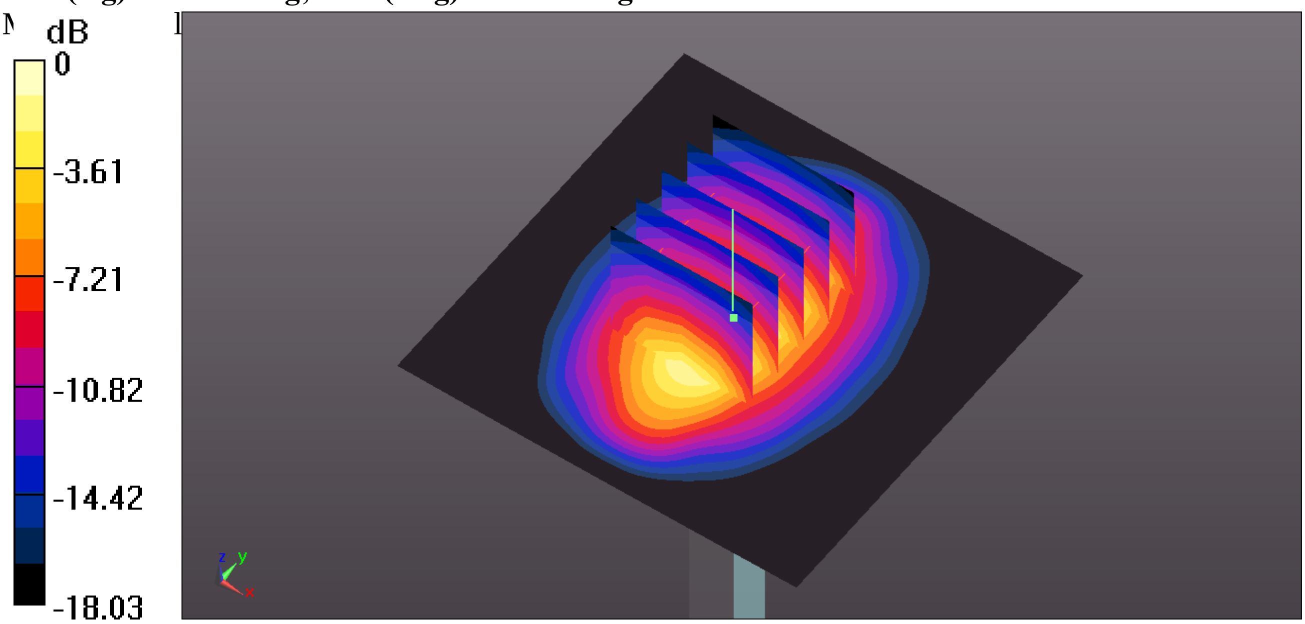
DUT: D1900V2-SN: 5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150903 Medium parameters used: f = 1900 MHz; σ = 1.542 S/m; ε_r = 53.532; ρ = 1000 kg/m^3
Ambient Temperature: 23.5 ℃ ; **Liquid Temperature**: 22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.39, 7.39, 7.39); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.9 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 90.00 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 19.8 W/kg
SAR(1 g) = 10.8 W/kg; SAR(10 g) = 5.58 W/kg



0 dB = 15.9 W/kg

System Check_Body_2450MHz_150901

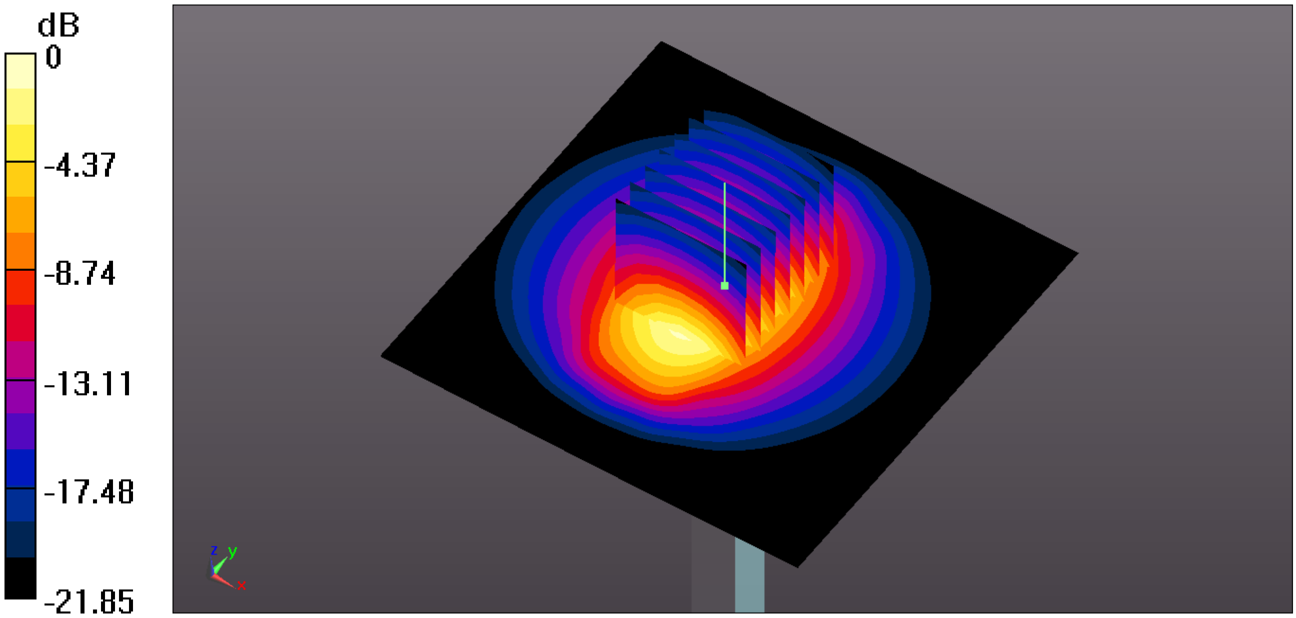
DUT: D2450V2-SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_150901 Medium parameters used: f = 2450 MHz; σ = 1.909 S/m; ε_r = 50.971; ρ = 1000 kg/m^3
Ambient Temperature: 23.2 ℃ ; **Liquid Temperature**: 22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3898; ConvF(7.35, 7.35, 7.35); Calibrated: 2015.08.06;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1386; Calibrated: 2015.02.19
- Phantom: SAM3; Type: QDOVA001BB; Serial: TP:1232
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 17.7 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.88 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 24.6 W/kg
SAR(1 g) = 11.8 W/kg; SAR(10 g) = 5.64 W/kg
Maximum value of SAR (measured) = 18.0 W/kg



0 dB = 17.7 W/kg

System Check_Body_2600MHz_150902

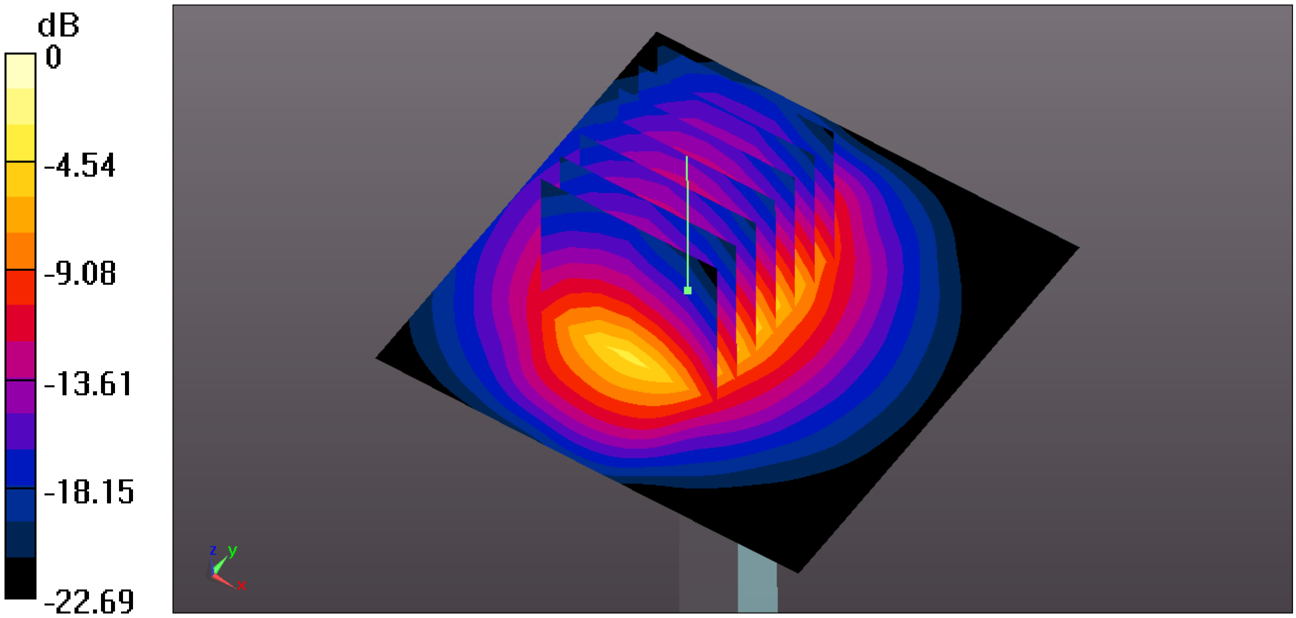
DUT: D2600V2-SN:1061

Communication System: UID 0, CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: MSL_2600_150902 Medium parameters used: f = 2600 MHz; σ = 2.209 S/m; ε_r = 51.123; ρ = 1000 kg/m^3
Ambient Temperature: 23.4 ℃ ; **Liquid Temperature**: 22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(6.8, 6.8, 6.8); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 22.3 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.79 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 29.3 W/kg
SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.22 W/kg
Maximum value of SAR (measured) = 21.5 W/kg



0 dB = 22.3 W/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

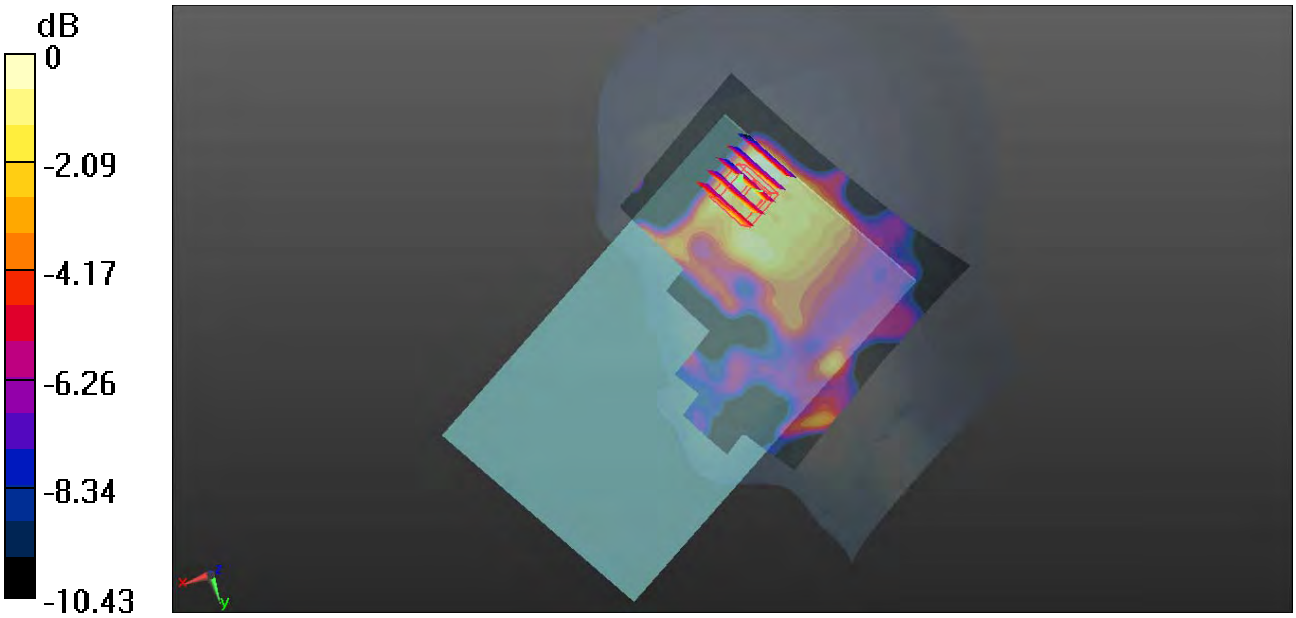
#01_GSM850_GPRS(4 Tx slots)_Right Tilted_Ch189_Sensor Off

Communication System: UID 0, GPRS/EDGE12 (0); Frequency: 836.4 MHz;Duty Cycle: 1:2.08
Medium: HSL_835_150903 Medium parameters used: f = 836.4 MHz; σ = 0.928 S/m; ε_r = 42.659; ρ = 1000 kg/m^3
Ambient Temperature: 23.3 ℃ ; **Liquid Temperature**: 22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(9.48, 9.48, 9.48); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch189/Area Scan (101x161x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.105 W/kg

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.536 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.0820 W/kg
SAR(1 g) = 0.063 W/kg; SAR(10 g) = 0.045 W/kg
Maximum value of SAR (measured) = 0.0743 W/kg



0 dB = 0.105 W/kg

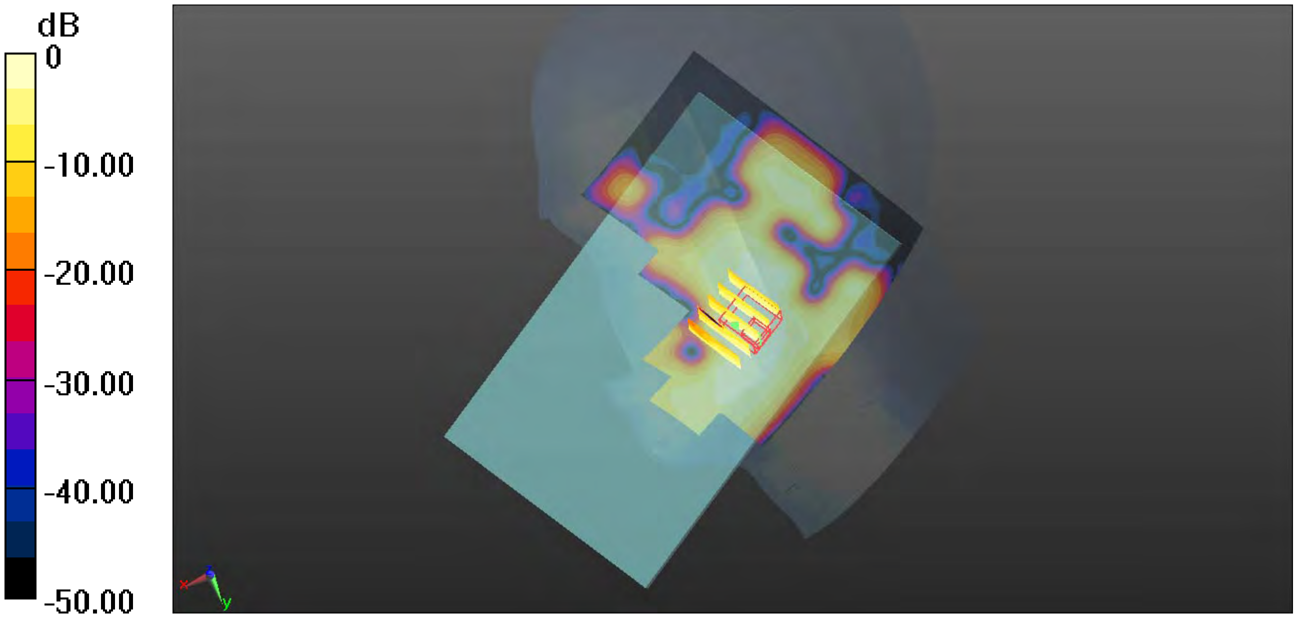
#02_GSM1900_GPRS(4 Tx slots)_Right Cheek_Ch512_Sensor Off

Communication System: UID 0, GPRS/EDGE12 (0); Frequency: 1850.2 MHz;Duty Cycle: 1:2.08
Medium: HSL_1900_150901 Medium parameters used: f = 1850.2 MHz; σ = 1.363 S/m; ε_r = 41.24; ρ = 1000 kg/m^3
Ambient Temperature: 23.2 ℃ ; **Liquid Temperature**: 22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.66, 7.66, 7.66); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch512/Area Scan (101x161x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.159 W/kg

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.853 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.147 W/kg
SAR(1 g) = 0.099 W/kg; SAR(10 g) = 0.061 W/kg
Maximum value of SAR (measured) = 0.117 W/kg



0 dB = 0.159 W/kg

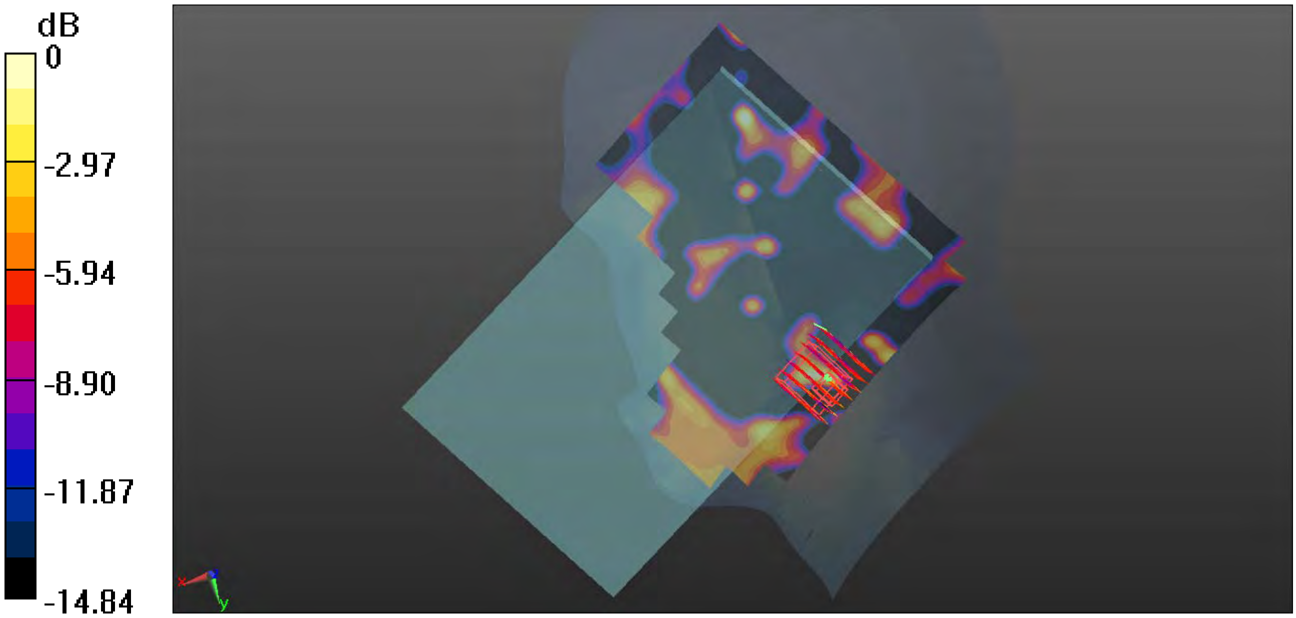
#03_LTE Band 41_20M_QPSK_1RB_99Offset_Right Cheek_Ch40690_Sensor Off

Communication System: UID 0, LTE (0); Frequency: 2600 MHz;Duty Cycle: 1:1.59
Medium: HSL_2600_150903 Medium parameters used: f = 2600 MHz; σ = 1.993 S/m; ε_r = 37.984; ρ = 1000 kg/m^3
Ambient Temperature: 23.3 ℃ ; **Liquid Temperature**: 22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(6.92, 6.92, 6.92); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch40690/Area Scan (131x201x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.124 W/kg

Ch40690/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.861 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0820 W/kg
SAR(1 g) = 0.047 W/kg; SAR(10 g) = 0.022 W/kg
Maximum value of SAR (measured) = 0.0679 W/kg



0 dB = 0.124 W/kg

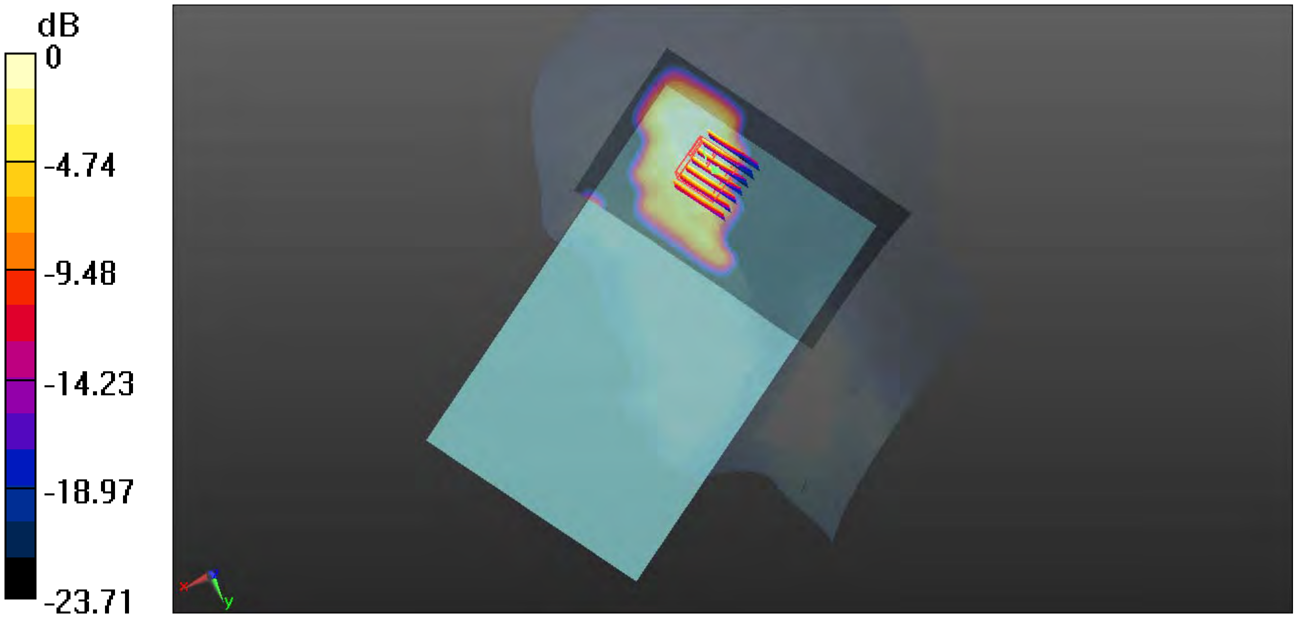
#04_WLAN2.4GHz_802.11b 1Mbps_Right Cheek_Ch6

Communication System: UID 0, WIFI (0); Frequency: 2437 MHz;Duty Cycle: 1:1.019
Medium: HSL_2450_150904 Medium parameters used: f = 2437 MHz; σ = 1.846 S/m; ε_r = 39.627; ρ = 1000 kg/m^3
Ambient Temperature: 23.6 ℃ ; **Liquid Temperature**: 22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.01, 7.01, 7.01); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (121x71x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.526 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.715 W/kg
SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.180 W/kg
Maximum value of SAR (measured) = 0.554 W/kg



0 dB = 0.526 W/kg

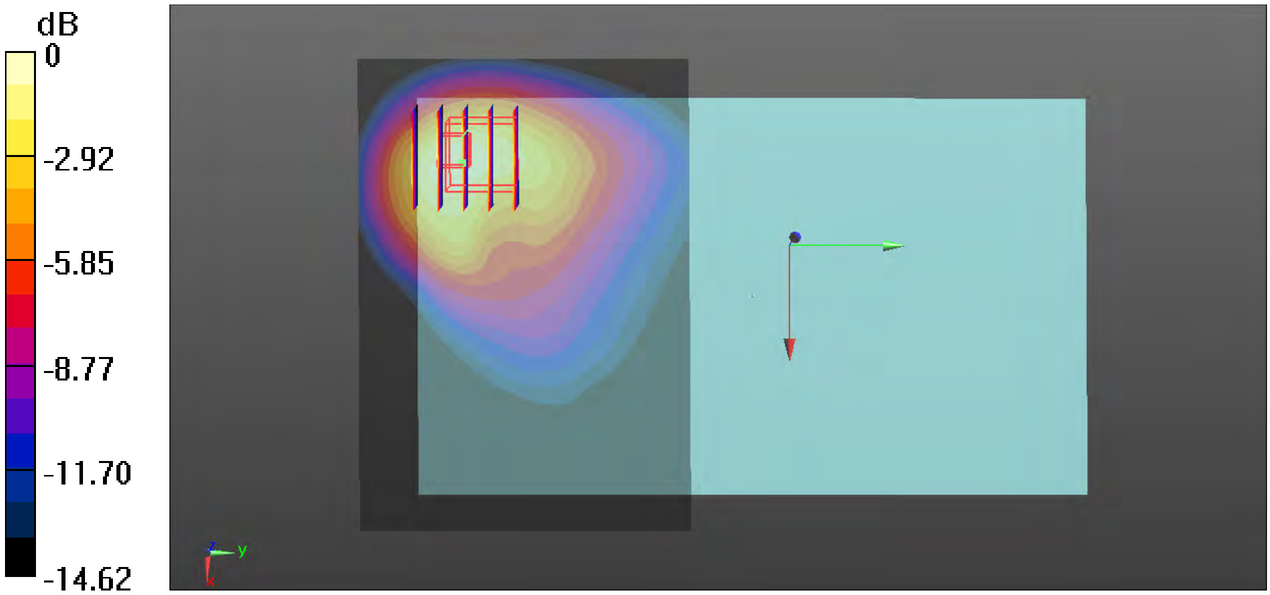
#05_GSM850_GPRS(4 Tx slots)_Bottom Face_0mm_Ch251_Sensor On

Communication System: UID 0, GPRS/EDGE12 (0); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_150903 Medium parameters used: f = 848.8 MHz; σ = 1.01 S/m; ε_r = 54.249; ρ = 1000 kg/m^3
Ambient Temperature: 23.5 ℃ ; **Liquid Temperature**: 22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3898; ConvF(9.97, 9.97, 9.97); Calibrated: 2015.08.06;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1386; Calibrated: 2015.02.19
- Phantom: SAM2; Type: QDOVA001BB; Serial: TP:1233
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch251/Area Scan (101x71x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.61 W/kg

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.412 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.01 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.593 W/kg
Maximum value of SAR (measured) = 1.36 W/kg



0 dB = 1.61 W/kg

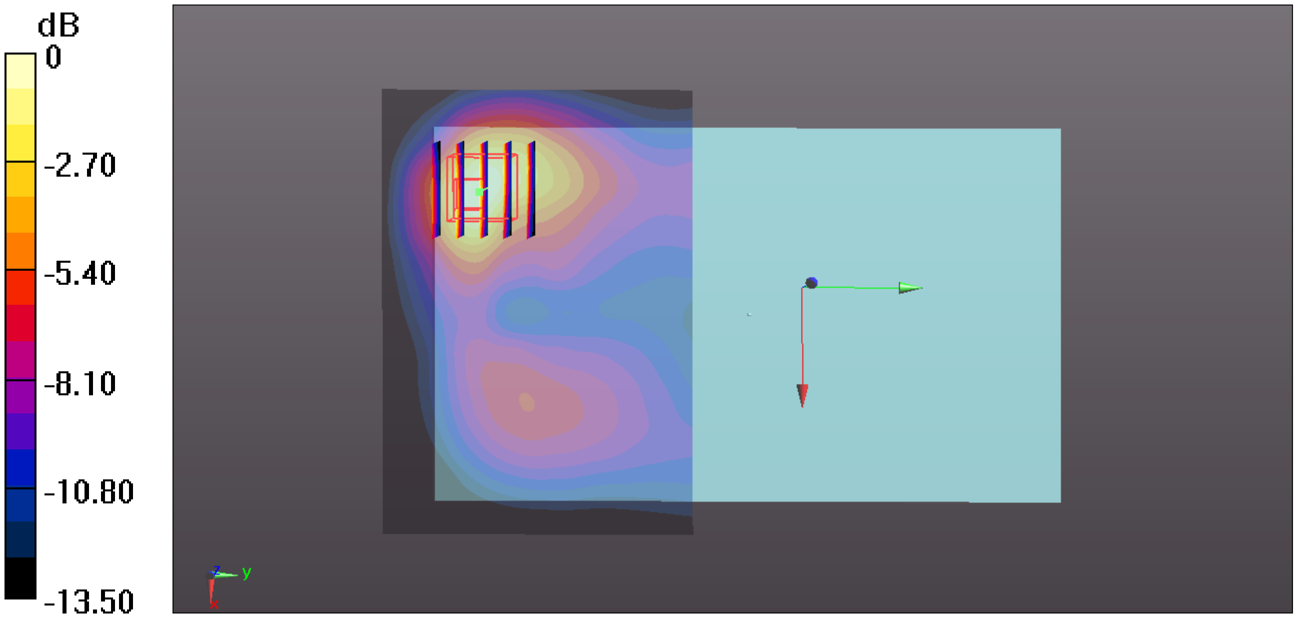
#06_GSM1900_GPRS(4 Tx slots)_Bottom Face_10mm_Ch810_Sensor Off

Communication System: UID 0, GPRS/EDGE12 (0); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_150903 Medium parameters used: f = 1909.8 MHz; σ = 1.553 S/m; ε_r = 53.507; ρ = 1000 kg/m^3
Ambient Temperature: 23.5 ℃ ; **Liquid Temperature**: 22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.39, 7.39, 7.39); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch810/Area Scan (101x71x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.38 W/kg

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.577 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 0.905 W/kg; SAR(10 g) = 0.513 W/kg
Maximum value of SAR (measured) = 1.14 W/kg



0 dB = 1.38 W/kg

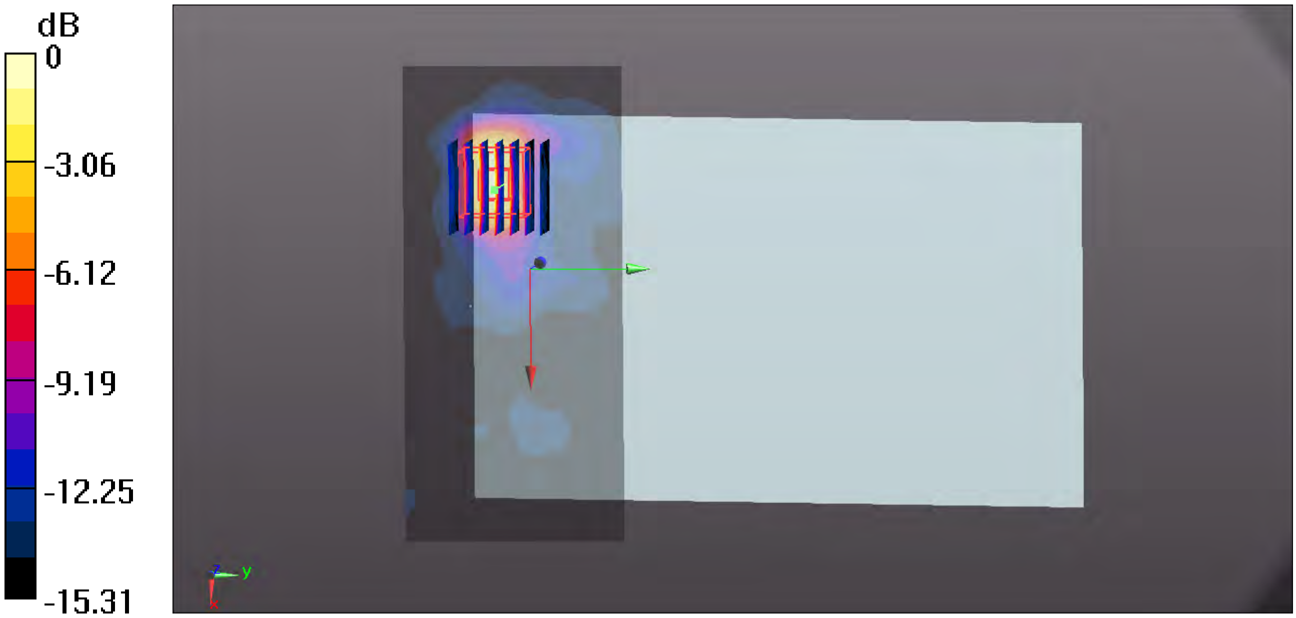
#07_LTE Band 41_20M_QPSK_50RB_49Offset_Curved surface of Edge 3_0mm_Ch41140_Sensor On

Communication System: UID 0, LTE (0); Frequency: 2645 MHz;Duty Cycle: 1:1.59
Medium: MSL_2600_150902 Medium parameters used: f = 2645 MHz; σ = 2.197 S/m; ε_r = 51.063; ρ = 1000 kg/m^3
Ambient Temperature: 23.4 ℃ ; **Liquid Temperature**: 22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(6.8, 6.8, 6.8); Calibrated: 2014.11.13;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2014.12.11
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch41140/Area Scan (131x61x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 1.54 W/kg

Ch41140/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.384 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 2.52 W/kg
SAR(1 g) = 0.963 W/kg; SAR(10 g) = 0.365 W/kg
Maximum value of SAR (measured) = 1.65 W/kg



0 dB = 1.65 W/kg

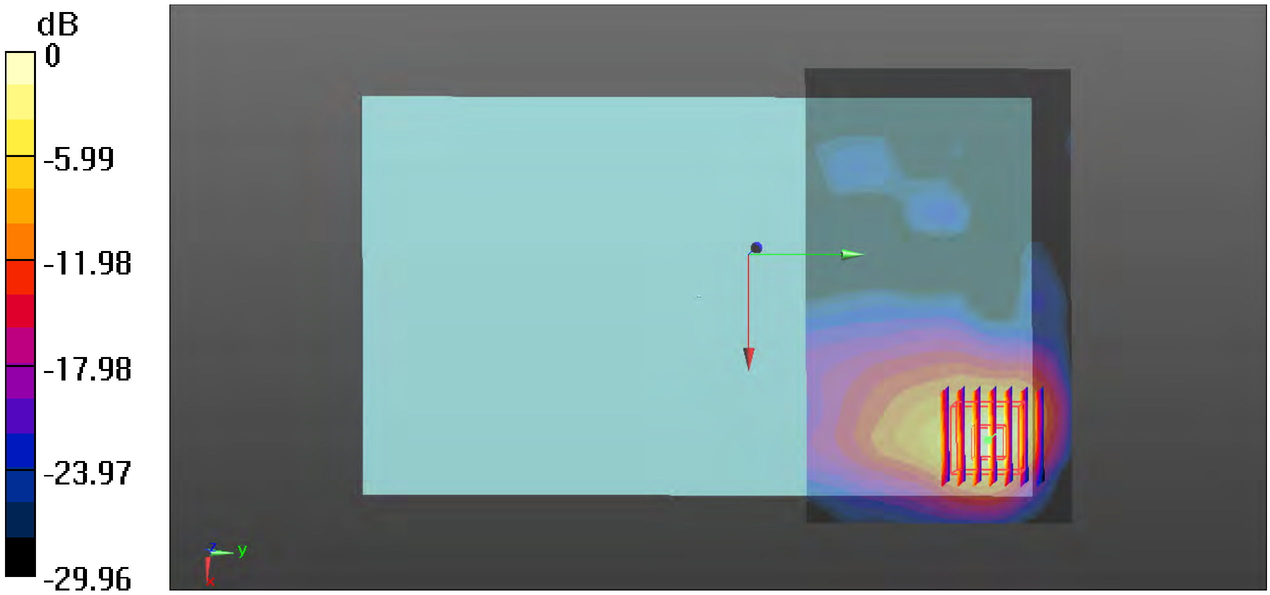
#08_WLAN2.4GHz_802.11b 1Mbps_Bottom Face_0mm_Ch11

Communication System: UID 0, WIFI (0); Frequency: 2462 MHz;Duty Cycle: 1:1.019
Medium: MSL_2450_150901 Medium parameters used: f = 2462 MHz; σ = 1.928 S/m; ε_r = 50.903; ρ = 1000 kg/m^3
Ambient Temperature: 23.2 ℃ ; **Liquid Temperature**: 22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3898; ConvF(7.35, 7.35, 7.35); Calibrated: 2015.08.06;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1386; Calibrated: 2015.02.19
- Phantom: SAM3; Type: QDOVA001BB; Serial: TP:1232
- Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Ch11/Area Scan (121x71x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 1.84 W/kg

Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.7650 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.54 W/kg
SAR(1 g) = 1 W/kg; SAR(10 g) = 0.362 W/kg
Maximum value of SAR (measured) = 1.71 W/kg



0 dB = 1.71 W/kg