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FCC SAR Test Report

Report No. : SA140219C09

Applicant : Motorola Solutions, Inc.

Address : One Motorola Plaza, Holtsville, NY 11742-1300 USA

Product : Touch Computer

FCC ID : UZ7TC700H

Brand : Motorola

Model No. : TC700H

Standards : FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1992 / IEEE 1528:2003
 IEEE 1528a-2005 / KDB 865664 D01 v01r03 / KDB 248227 D01 v01r02
 KDB 447498 D01 v05r02 / KDB 648474 D04 v01r02

Sample Received Date : Feb. 19, 2014

Date of Testing : Mar. 17, 2014 ~ Mar. 21, 2014

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample’s SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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Table of Contents

Release Control Record	3
1. Summary of Maximum SAR Value	4
2. Description of Equipment Under Test	5
3. SAR Measurement System	6
3.1 Definition of Specific Absorption Rate (SAR)	6
3.2 SPEAG DASY System	6
3.2.1 Robot.....	7
3.2.2 Probes.....	8
3.2.3 Data Acquisition Electronics (DAE)	8
3.2.4 Phantoms	9
3.2.5 Device Holder.....	10
3.2.6 System Validation Dipoles	10
3.2.7 Tissue Simulating Liquids.....	11
3.3 SAR System Verification	14
3.4 SAR Measurement Procedure	15
3.4.1 Area & Zoom Scan Procedure	15
3.4.2 Volume Scan Procedure.....	15
3.4.3 Power Drift Monitoring.....	16
3.4.4 Spatial Peak SAR Evaluation	16
3.4.5 SAR Averaged Methods	16
4. SAR Measurement Evaluation	17
4.1 EUT Configuration and Setting.....	17
4.2 EUT Testing Position	18
4.2.1 Head Exposure Conditions.....	18
4.2.2 Body-Worn Accessory Exposure Conditions	20
4.2.3 SAR Test Exclusions	21
4.3 Tissue Verification	21
4.4 System Validation.....	22
4.5 System Verification.....	22
4.6 Maximum Output Power.....	23
4.6.1 Maximum Conducted Power	23
4.6.2 Measured Conducted Power Result.....	23
4.7 SAR Testing Results	25
4.7.1 SAR Results for Head	25
4.7.2 SAR Results for Body-Worn (EUT Standalone, Separation Distance is 1.5 cm Gap)	25
4.7.3 SAR Results for Body-Worn (EUT with Holster, Separation Distance is 0 cm Gap).....	26
4.7.4 SAR Measurement Variability.....	26
5. Calibration of Test Equipment.....	27
6. Measurement Uncertainty	28
7. Information on the Testing Laboratories	30
Appendix A. SAR Plots of System Verification	
Appendix B. SAR Plots of SAR Measurement	
Appendix C. Calibration Certificate for Probe and Dipole	
Appendix D. Photographs of EUT and Setup	



Release Control Record

Report No.	Reason for Change	Date Issued
SA140219C09	Initial release	Apr. 15, 2014

**FCC SAR Test Report****1. Summary of Maximum SAR Value**

Equipment Class	Mode	Highest Reported Head SAR _{1q} (W/kg)	Highest Reported Body-Worn SAR _{1q} (W/kg)
DTS	2.4G WLAN	0.38	0.21
	5.8G WLAN	0.09	0.25
NII	5.2G WLAN	0.06	0.23
	5.3G WLAN	0.12	0.27
	5.6G WLAN	0.09	0.25
DSS	Bluetooth	N/A	N/A
DXX	NFC	N/A	N/A

Note:

1. The SAR limit (**Head & Body: SAR_{1q} 1.6 W/kg**) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.



FCC SAR Test Report

2. Description of Equipment Under Test

EUT Type	Touch Computer
FCC ID	UZ7TC700H
Brand Name	Motorola
Model Name	TC700H
HW Version	EV1b
SW Version	Android Version: 4.4.2 Build Number: 99-23245-K-03-05-01-E1-030114
Tx Frequency Bands (Unit: MHz)	WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480 NFC : 13.56
Uplink Modulations	802.11b : DSSS 802.11a/g/n : OFDM Bluetooth : GFSK NFC : ASK
Maximum Tune-up Conducted Power (Unit: dBm)	WLAN 2.4G : 20.5 WLAN 5.2G : 16.9 WLAN 5.3G : 17.0 WLAN 5.6G : 16.5 WLAN 5.8G : 17.0 Bluetooth : 4.5
Antenna Type	PIFA Antenna
EUT Stage	Identical Prototype

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory:

Battery	Brand Name	Motorola
	Model Name	82-171249-01
	Power Rating	3.7Vdc, 4500mAh
	Type	Li-ion
Holster	Brand Name	Motorola
	Model Name	SG-TC7X-HLSTR1-01

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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.

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:

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

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

SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY4/5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC.

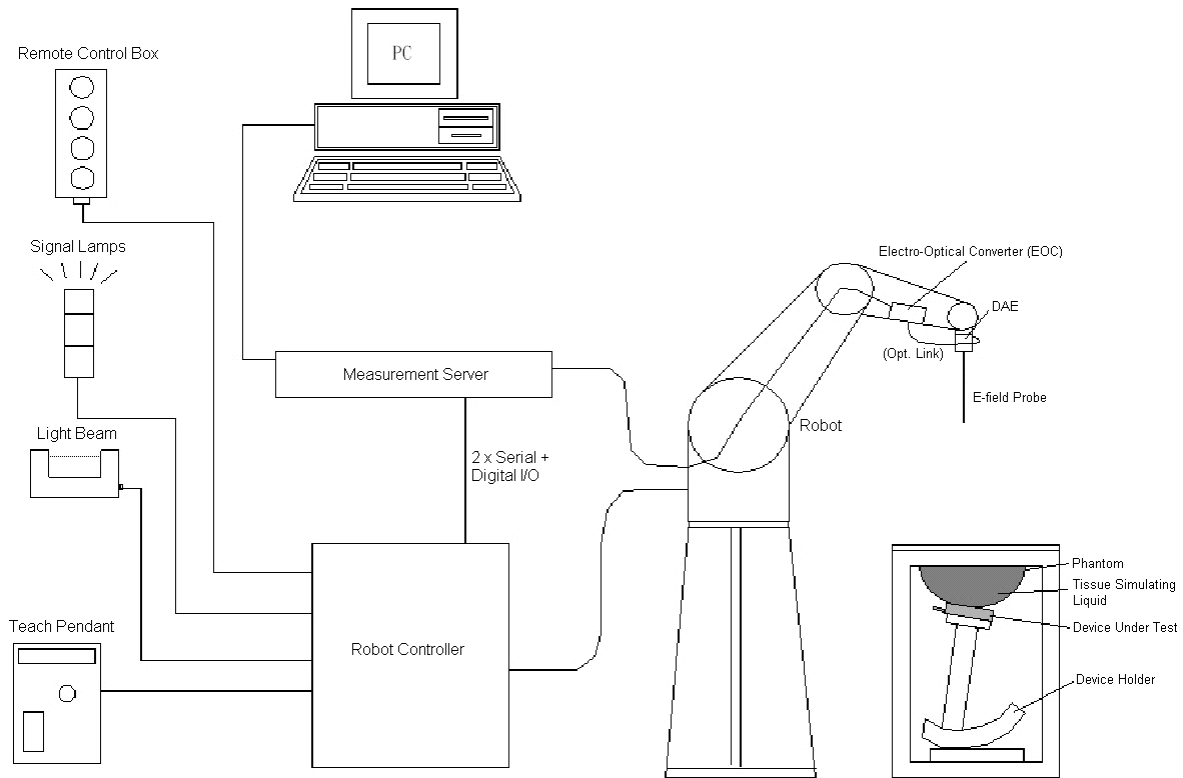


Fig-3.1 DASY System Setup

3.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ± 0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)



Fig-3.2 DASY4





Fig-3.3 DASY5

FCC SAR Test Report


3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	


Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	5 μ W/g to 100 mW/g Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

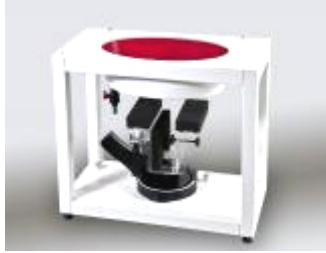
3.2.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)	
Input Offset Voltage	< 5 μ V (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

FCC SAR Test Report


3.2.4 Phantoms


Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	


FCC SAR Test Report

3.2.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

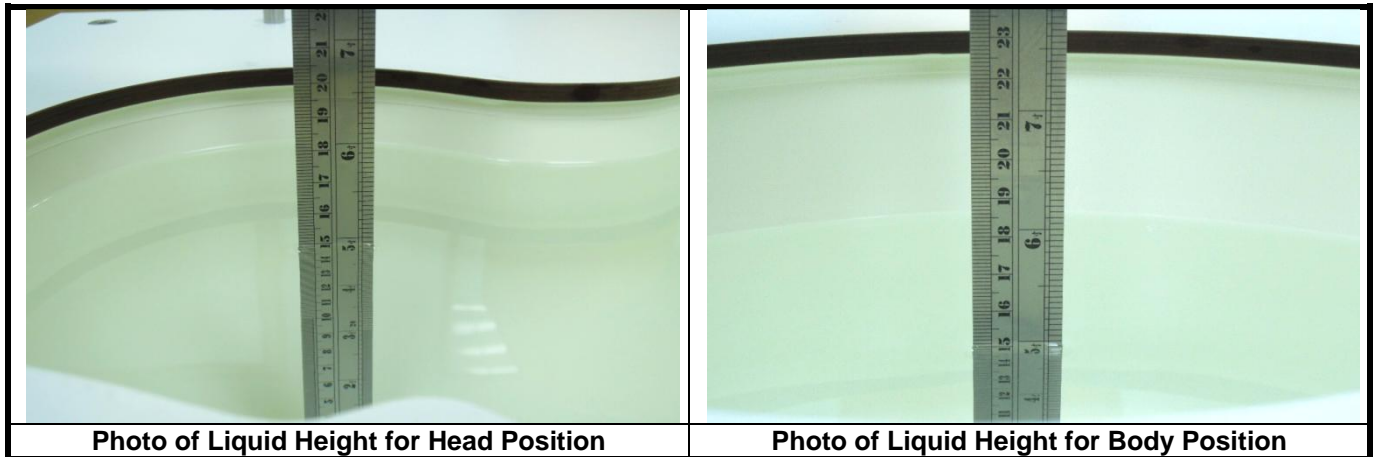
3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with 1/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

FCC SAR Test Report

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.



The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528, and KDB 865664 D01 Appendix A. For the body tissue simulating liquids, the dielectric properties are defined in KDB 865664 D01 Appendix A. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

FCC SAR Test Report
Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of $\pm 5\%$	Target Conductivity	Range of $\pm 5\%$
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
For Body				
750	55.5	52.7 ~ 58.3	0.96	0.91 ~ 1.01
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
900	55.0	52.3 ~ 57.8	1.05	1.00 ~ 1.10
1450	54.0	51.3 ~ 56.7	1.30	1.24 ~ 1.37
1640	53.8	51.1 ~ 56.5	1.40	1.33 ~ 1.47
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1800	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2000	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2300	52.9	50.3 ~ 55.5	1.81	1.72 ~ 1.90
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
2600	52.5	49.9 ~ 55.1	2.16	2.05 ~ 2.27
3500	51.3	48.7 ~ 53.9	3.31	3.14 ~ 3.48
5200	49.0	46.6 ~ 51.5	5.30	5.04 ~ 5.57
5300	48.9	46.5 ~ 51.3	5.42	5.15 ~ 5.69
5500	48.6	46.2 ~ 51.0	5.65	5.37 ~ 5.93
5600	48.5	46.1 ~ 50.9	5.77	5.48 ~ 6.06
5800	48.2	45.8 ~ 50.6	6.00	5.70 ~ 6.30

FCC SAR Test Report

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.5	56.0	-	42.1	-
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H900	0.2	-	0.2	1.4	58.0	-	40.2	-
H1450	-	43.3	-	0.6	-	-	56.1	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1800	-	44.5	-	0.3	-	-	55.2	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2000	-	44.5	-	0.1	-	-	55.4	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.5	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	31.0	-	0.2	-	-	68.8	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

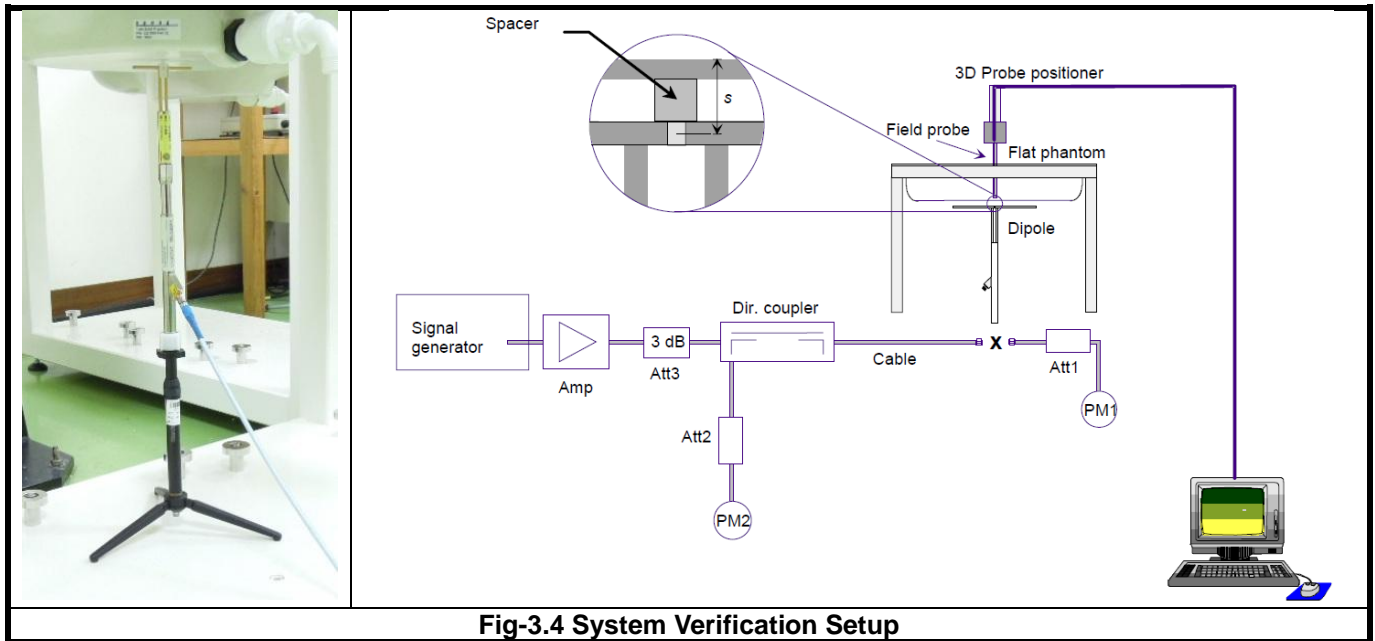


Fig-3.4 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touched to the phantom surface with a light pressure at the reference marking and is oriented parallel to the long side of the phantom. The power meter PM1 measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR 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

The SAR measurement procedures for each of test conditions are as follows:

- (a) Make EUT to transmit maximum output power
- (b) Measure conducted output power through RF cable
- (c) Place the EUT in the specific position of phantom
- (d) Perform SAR testing steps on the DASY system
- (e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	<= 2 GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan ($\Delta x, \Delta y$)	<= 15 mm	<= 12 mm	<= 12 mm	<= 10 mm	<= 10 mm
Zoom Scan ($\Delta x, \Delta y$)	<= 8 mm	<= 5 mm	<= 5 mm	<= 4 mm	<= 4 mm
Zoom Scan (Δz)	<= 5 mm	<= 5 mm	<= 4 mm	<= 3 mm	<= 2 mm
Zoom Scan Volume	>= 30 mm	>= 30 mm	>= 28 mm	>= 25 mm	>= 22 mm

Note:

When zoom scan is required and report SAR is <= 1.4 W/kg, the zoom scan resolution of $\Delta x / \Delta y$ (2-3GHz: <= 8 mm, 3-4GHz: <= 7 mm, 4-6GHz: <= 5 mm) may be applied.

3.4.2 Volume Scan Procedure

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.

FCC SAR Test Report

3.4.3 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 drift more than 5%, the SAR will be retested.

3.4.4 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 from 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

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

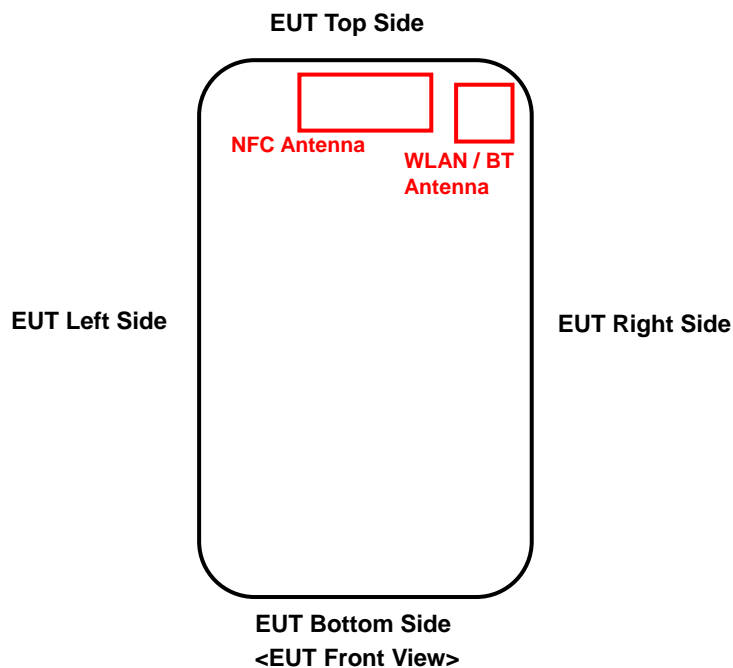
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

For WLAN SAR testing, the EUT has installed WLAN engineering testing software which can provide continuous transmitting RF signal. According to KDB 248227 D01, WLAN SAR should be tested at the lowest data rate, and testing at higher data rate is not required when the maximum average output power is less than 1/4 dB higher than those measured at the lowest data rate. Since the WLAN power at the lowest data rate has the highest output power, WLAN SAR for this device was performed at the lowest data rate.

<Antenna Location>



The separation distance for antenna to edge:

Antenna	To Top Side (mm)	To Bottom Side (mm)	To Left Side (mm)	To Right Side (mm)
WLAN / BT	13.91	140.12	64.13	16.57
NFC	6.75	144.52	23.3	27.03

4.2 EUT Testing Position

According to KDB 648474 D04, handsets are tested for SAR compliance in head, and body-worn accessory configurations described in the following subsections.

4.2.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2003 using the SAM phantom illustrated as below.

1. Define two imaginary lines on the handset
 - (a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
 - (b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
 - (c) 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, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

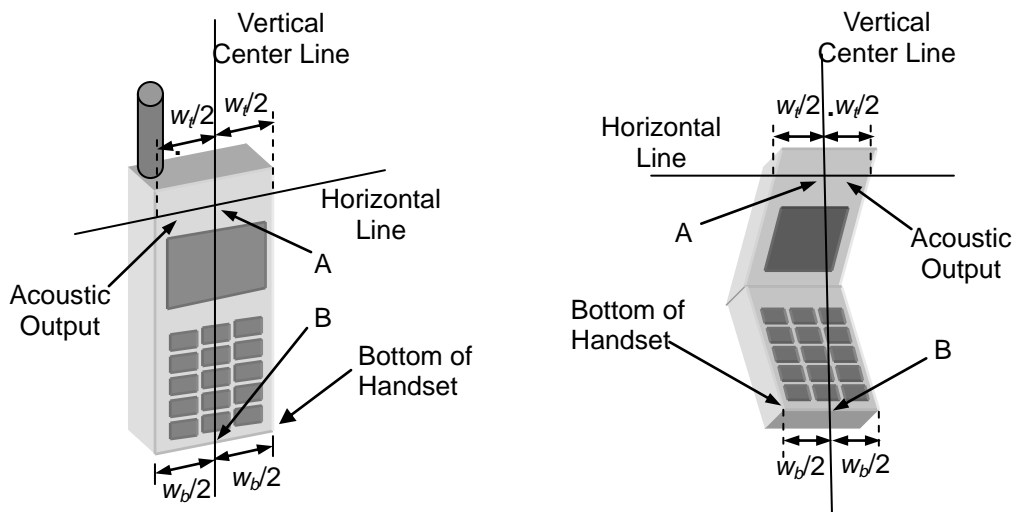


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

FCC SAR Test Report

2. Cheek Position

- (a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- (b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

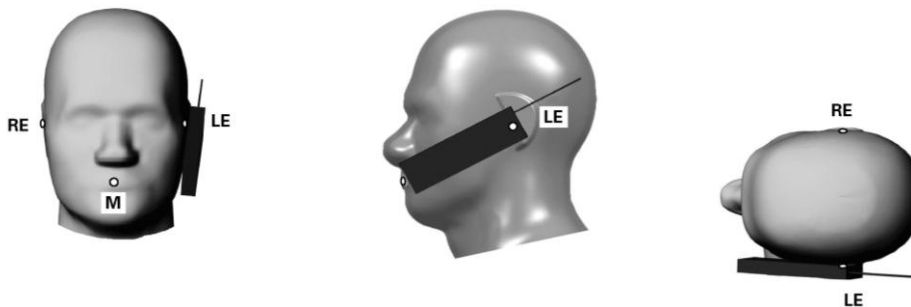


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

- (a) To position the device in the “cheek” position described above.
- (b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig-4.3).

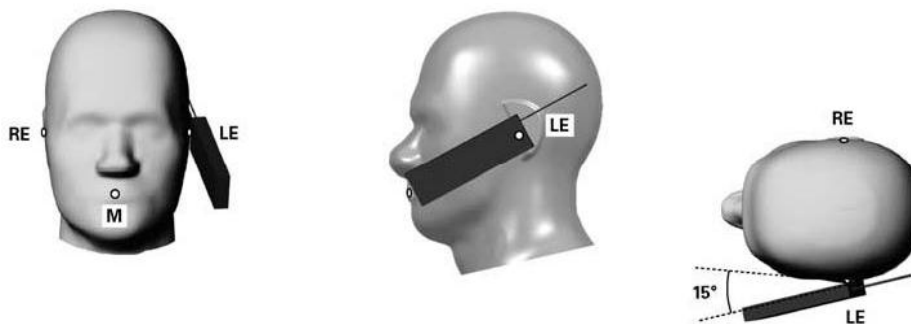


Fig-4.3 Illustration for Tilted Position

4.2.2 Body-Worn Accessory Exposure Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 D01 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.

A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance ≤ 5 mm to support compliance.

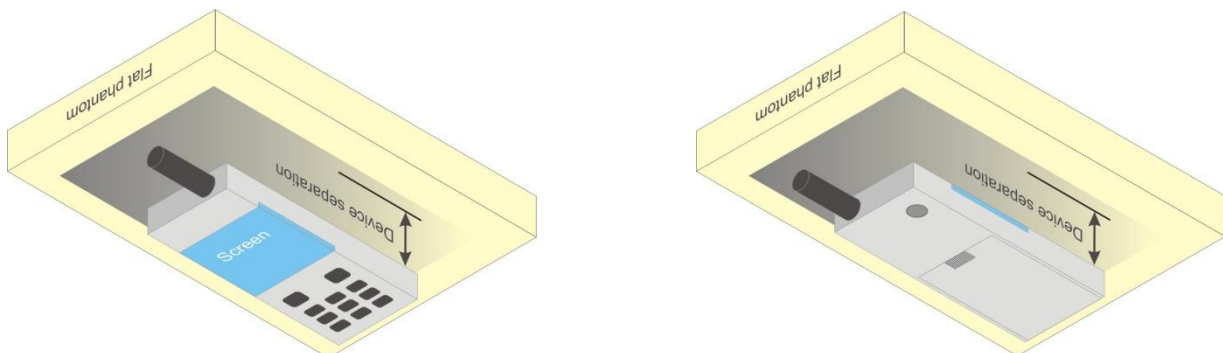


Fig-4.4 Illustration for Body Worn Position

FCC SAR Test Report

4.2.3 SAR Test Exclusions

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

$$\frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \sqrt{f_{(GHz)}} \leq 3.0 \text{ for SAR-1g, } \leq 7.5 \text{ for SAR-10g}$$

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

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Body-Worn		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
BT (2.48 GHz)	4.5	3	15	0.3	No

4.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (°C)	Measured Conductivity (σ)	Measured Permittivity (ε _r)	Target Conductivity (σ)	Target Permittivity (ε _r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Mar. 20, 2014	Head	2450	21.1	1.861	38.631	1.80	39.2	3.39	-1.45
Mar. 21, 2014	Head	5200	20.1	4.800	35.629	4.66	36.0	3.00	-1.03
Mar. 17, 2014	Head	5300	21.8	4.906	35.237	4.76	35.9	3.07	-1.85
Mar. 18, 2014	Head	5600	21.3	5.226	34.677	5.07	35.5	3.08	-2.32
Mar. 18, 2014	Head	5800	21.3	5.439	34.384	5.27	35.3	3.21	-2.59
Mar. 19, 2014	Body	2450	21.9	1.972	51.404	1.95	52.7	1.13	-2.46
Mar. 21, 2014	Body	5200	20.2	5.350	47.721	5.30	49.0	0.94	-2.61
Mar. 19, 2014	Body	5300	20.5	5.322	48.374	5.42	48.9	-1.81	-1.08
Mar. 19, 2014	Body	5600	20.5	5.753	47.615	5.77	48.5	-0.29	-1.82
Mar. 19, 2014	Body	5800	20.5	5.952	47.421	6.00	48.2	-0.80	-1.62

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 °C.

4.4 System Validation

The SAR measurement system was validated according to procedures in KDB 865664 D01 v01r01. The validation status in tabulated summary is as below.

Test Date	Probe S/N	Calibration Point		Measured Conductivity (σ)	Measured Permittivity (ϵ_r)	Validation for CW			Validation for Modulation		
						Sensitivity Range	Probe Linearity	Probe Isotropy	Modulation Type	Duty Factor	PAR
Mar. 20, 2014	3864	Head	2450	1.861	38.631	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 21, 2014	3864	Head	5200	4.800	35.629	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 17, 2014	3650	Head	5300	4.906	35.237	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 18, 2014	3650	Head	5600	5.226	34.677	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 18, 2014	3650	Head	5800	5.439	34.384	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 19, 2014	3864	Body	2450	1.972	51.404	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 21, 2014	3864	Body	5200	5.350	47.721	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 19, 2014	3650	Body	5300	5.322	48.374	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 19, 2014	3650	Body	5600	5.753	47.615	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 19, 2014	3650	Body	5800	5.952	47.421	Pass	Pass	Pass	OFDM	N/A	Pass

4.5 System Verification

The measuring result for system verification is tabulated as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Mar. 20, 2014	Head	2450	53.00	12.7	50.80	-4.15	716	3864	1277
Mar. 21, 2014	Head	5200	79.20	7.96	79.60	0.51	1018	3864	1277
Mar. 17, 2014	Head	5300	82.60	8.50	85.00	2.91	1018	3650	913
Mar. 18, 2014	Head	5600	82.80	8.26	82.60	-0.24	1018	3650	913
Mar. 18, 2014	Head	5800	79.50	7.61	76.10	-4.28	1018	3650	913
Mar. 19, 2014	Body	2450	50.00	13.0	52.00	4.00	716	3864	1277
Mar. 21, 2014	Body	5200	74.90	7.46	74.60	-0.40	1018	3864	1277
Mar. 19, 2014	Body	5300	75.70	6.98	69.80	-7.79	1018	3650	913
Mar. 19, 2014	Body	5600	80.40	7.55	75.50	-6.09	1018	3650	913
Mar. 19, 2014	Body	5800	74.90	7.07	70.70	-5.61	1018	3650	913

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.



FCC SAR Test Report

4.6 Maximum Output Power

4.6.1 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11b	20.5	N/A	N/A	N/A	N/A
802.11g	18.0	N/A	N/A	N/A	N/A
802.11a	N/A	16.2	17.0	16.5	17.0
802.11n HT20	17.0	16.2	16.7	16.2	16.5
802.11n HT40	N/A	16.9	16.5	16.0	16.5

Mode	Bluetooth
All	4.5

4.6.2 Measured Conducted Power Result

The measuring conducted average power (Unit: dBm) is shown as below.

<WLAN 2.4G>

Mode	802.11b		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	20.08	20.12	18.95
Mode	802.11g		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	13.64	17.94	12.79
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	13.81	16.61	13.03

<WLAN 5.2G>

Mode	802.11a			
Channel / Frequency (MHz)	36 (5180)	40 (5200)	44 (5220)	48 (5240)
Average Power	16.09	15.90	15.94	15.76
Mode	802.11n (HT20)			
Channel / Frequency (MHz)	36 (5180)	40 (5200)	44 (5220)	48 (5240)
Average Power	16.11	15.96	16.01	15.84
Mode	802.11n (HT40)			
Channel / Frequency (MHz)	38 (5190)		46 (5230)	
Average Power	12.43		16.83	



FCC SAR Test Report

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<WLAN 5.3G>

Mode	802.11a			
Channel / Frequency (MHz)	52 (5260)	56 (5280)	60 (5300)	64 (5320)
Average Power	16.96	16.95	16.99	16.44
Mode	802.11n (HT20)			
Channel / Frequency (MHz)	52 (5260)	56 (5280)	60 (5300)	64 (5320)
Average Power	16.62	16.61	16.64	16.05
Mode	802.11n (HT40)			
Channel / Frequency (MHz)	54 (5270)		62 (5310)	
Average Power	16.49		11.63	

<WLAN 5.6G>

Mode	802.11a							
Channel / Frequency (MHz)	100 (5500)	104 (5520)	108 (5540)	112 (5560)	116 (5580)	132 (5660)	136 (5680)	140 (5700)
Average Power	14.47	16.19	16.12	16.24	16.22	15.93	16.38	12.31
Mode	802.11n (HT20)							
Channel / Frequency (MHz)	100 (5500)	104 (5520)	108 (5540)	112 (5560)	116 (5580)	132 (5660)	136 (5680)	140 (5700)
Average Power	14.61	16.12	16.07	16.03	15.86	15.88	15.73	12.12
Mode	802.11n (HT40)							
Channel / Frequency (MHz)	102 (5510)				134 (5670)			
Average Power	11.15				15.33			

<WLAN 5.8G>

Mode	802.11a				
Channel / Frequency (MHz)	149 (5745)	153 (5765)	157 (5785)	161 (5805)	165 (5825)
Average Power	16.49	16.43	16.10	16.18	16.56
Mode	802.11n (HT20)				
Channel / Frequency (MHz)	149 (5745)	153 (5765)	157 (5785)	161 (5805)	165 (5825)
Average Power	16.06	16.15	16.12	15.89	15.89
Mode	802.11n (HT40)				
Channel / Frequency (MHz)	151 (5755)		159 (5795)		
Average Power	16.18		16.03		

4.7 SAR Testing Results

4.7.1 SAR Results for Head

Plot No.	Band	Mode	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	802.11b	-	Right Cheek	6	20.5	20.12	1.09	-0.01	0.101	0.11
	802.11b	-	Right Tilted	6	20.5	20.12	1.09	-0.08	0.094	0.10
01	802.11b	-	Left Cheek	6	20.5	20.12	1.09	-0.04	0.349	0.38
	802.11b	-	Left Tilted	6	20.5	20.12	1.09	0.01	0.167	0.18
	802.11a	-	Right Cheek	36	16.2	16.09	1.03	-0.05	0.036	0.04
	802.11a	-	Right Tilted	36	16.2	16.09	1.03	0.01	0.016	0.02
02	802.11a	-	Left Cheek	36	16.2	16.09	1.03	0.02	0.061	0.06
	802.11a	-	Left Tilted	36	16.2	16.09	1.03	0.01	0.025	0.03
	802.11n	HT40	Left Cheek	46	16.9	16.83	1.02	0.04	0.052	0.05
	802.11a	-	Right Cheek	60	17.0	16.99	1.00	0.02	0.059	0.06
	802.11a	-	Right Tilted	60	17.0	16.99	1.00	0.10	0.032	0.03
03	802.11a	-	Left Cheek	60	17.0	16.99	1.00	0.03	0.116	0.12
	802.11a	-	Left Tilted	60	17.0	16.99	1.00	0.07	0.068	0.07
	802.11a	-	Right Cheek	136	16.5	16.38	1.03	0.06	0.041	0.04
	802.11a	-	Right Tilted	136	16.5	16.38	1.03	0.03	0.045	0.05
04	802.11a	-	Left Cheek	136	16.5	16.38	1.03	0.07	0.087	0.09
	802.11a	-	Left Tilted	136	16.5	16.38	1.03	0.01	0.067	0.07
	802.11a	-	Right Cheek	165	17.0	16.56	1.11	0.06	0.055	0.06
	802.11a	-	Right Tilted	165	17.0	16.56	1.11	0.04	0.043	0.05
05	802.11a	-	Left Cheek	165	17.0	16.56	1.11	0.09	0.084	0.09
	802.11a	-	Left Tilted	165	17.0	16.56	1.11	-0.03	0.073	0.08

Note:

1. According to KDB 248227, when the extrapolated maximum peak SAR for the maximum output power channel is ≤ 1.6 W/kg and the 1g averaged SAR is ≤ 0.8 W/kg, WLAN SAR testing for other channels is not required.
2. SAR testing for 802.11g/n is not required when its maximum power is less than 1/4 dB higher than 802.11b.
3. SAR testing for 802.11n is not required when its maximum power is less than 1/4 dB higher than 802.11a.

4.7.2 SAR Results for Body-Worn (EUT Standalone, Separation Distance is 1.5 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	802.11b	-	Front Face	6	20.5	20.12	1.09	0.05	0.014	0.02
06	802.11b	-	Rear Face	6	20.5	20.12	1.09	-0.07	0.109	0.12
	802.11a	-	Front Face	36	16.2	16.09	1.03	0.00	0.025	0.03
07	802.11a	-	Rear Face	36	16.2	16.09	1.03	0.05	0.228	0.23
	802.11n	HT40	Rear Face	46	16.9	16.83	1.02	-0.01	0.213	0.22
	802.11a	-	Front Face	60	17.0	16.99	1.00	0.03	0.048	0.05
08	802.11a	-	Rear Face	60	17.0	16.99	1.00	0.07	0.268	0.27
	802.11a	-	Front Face	136	16.5	16.38	1.03	0.18	0.05	0.05
09	802.11a	-	Rear Face	136	16.5	16.38	1.03	0.09	0.24	0.25
	802.11a	-	Front Face	165	17.0	16.56	1.11	0.08	0.048	0.05
10	802.11a	-	Rear Face	165	17.0	16.56	1.11	0.15	0.223	0.25

Note:

1. According to KDB 248227, when the extrapolated maximum peak SAR for the maximum output power channel is ≤ 1.6 W/kg and the 1g averaged SAR is ≤ 0.8 W/kg, WLAN SAR testing for other channels is not required.
2. SAR testing for 802.11g/n is not required when its maximum power is less than 1/4 dB higher than 802.11b.
3. SAR testing for 802.11n is not required when its maximum power is less than 1/4 dB higher than 802.11a.



FCC SAR Test Report

4.7.3 SAR Results for Body-Worn (EUT with Holster, Separation Distance is 0 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
11	802.11b	-	Front Face	6	20.5	20.12	1.09	0.05	0.189	0.21
12	802.11a	-	Front Face	36	16.2	16.09	1.03	0.03	0.02	0.02
	802.11n	HT40	Front Face	46	16.9	16.83	1.02	-0.13	0.015	0.02
13	802.11a	-	Front Face	60	17.0	16.99	1.00	0.08	0.074	0.07
14	802.11a	-	Front Face	136	16.5	16.38	1.03	-0.16	0.051	0.05
15	802.11a	-	Front Face	165	17.0	16.56	1.11	0.06	0.063	0.07

Note:

1. This holster allows the EUT be installed for front face toward body only.
2. According to KDB 248227, when the extrapolated maximum peak SAR for the maximum output power channel is ≤ 1.6 W/kg and the 1g averaged SAR is ≤ 0.8 W/kg, WLAN SAR testing for other channels is not required.
3. SAR testing for 802.11g/n is not required when its maximum power is less than 1/4 dB higher than 802.11b.
4. SAR testing for 802.11n is not required when its maximum power is less than 1/4 dB higher than 802.11a.

4.7.4 SAR Measurement Variability

According to KDB 865664 D01 v01r01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10 , the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

Since all the measured SAR are less than 0.8 W/kg, the repeated measurement is not required.

Test Engineer : Ulysses Liu, and Allen Chen



5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Kit	SPEAG	D2450V2	716	Jul. 31, 2013	Annual
System Validation Kit	SPEAG	D5GHzV2	1018	Jul. 24, 2013	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3650	Apr. 30, 2013	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3801	Jun. 20, 2013	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3864	Jul. 31, 2013	Annual
Data Acquisition Electronics	SPEAG	DAE4	913	Dec. 17, 2013	Annual
Data Acquisition Electronics	SPEAG	DAE4	1277	Jul. 26, 2013	Annual
Data Acquisition Electronics	SPEAG	DAE4	1305	Jul. 08, 2013	Annual
ENA Series Network Analyzer	Agilent	E5071C	MY46214281	Jun. 10, 2013	Annual
MXG Analog Signal Generator	Agilent	N5181A	MY50143868	Jun. 06, 2013	Annual
Power Meter	Anritsu	ML2495A	1218009	Jun. 11, 2013	Annual
Power Sensor	Anritsu	MA2411B	1207252	Jun. 11, 2013	Annual
EXA Spectrum Analyzer	Agilent	N9010A	MY52100136	Jun. 26, 2013	Annual
Dielectric Probe Kit	Agilent	85070D	E2-020018	May 13, 2013	Annual
Thermometer	YFE	YF-160A	110600361	Feb. 19, 2014	Annual
Directional Coupler	Woken	0110A056020-10	11122702	Apr. 18, 2013	Annual
Power Amplifier	AR	5S1G4	0339656	Apr. 18, 2013	Annual
Power Amplifier	Mini-Circuit	ZVE-8G	001000422	Apr. 18, 2013	Annual
Attenuator	Woken	00800A1G01L-03	N/A	Apr. 18, 2013	Annual



6. Measurement Uncertainty

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.0	Normal	1	1	± 6.0 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	1.0	Rectangular	√3	1	± 0.6 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.6	Normal	1	1	± 0.6 %	∞
Response Time	0.0	Rectangular	√3	1	± 0.0 %	∞
Integration Time	1.7	Rectangular	√3	1	± 1.0 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.5	Rectangular	√3	1	± 0.3 %	∞
Probe Positioning	2.9	Rectangular	√3	1	± 1.7 %	∞
Max. SAR Eval.	2.3	Rectangular	√3	1	± 1.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	29
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	29
Combined Standard Uncertainty					± 11.7 %	
Expanded Uncertainty (K=2)					± 23.4 %	

Uncertainty budget for frequency range 300 MHz to 3 GHz



FCC SAR Test Report

A D T

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.55	Normal	1	1	± 6.55 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	2.0	Rectangular	√3	1	± 1.2 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.3	Normal	1	1	± 0.3 %	∞
Response Time	0.8	Rectangular	√3	1	± 0.5 %	∞
Integration Time	2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.8	Rectangular	√3	1	± 0.5 %	∞
Probe Positioning	9.9	Rectangular	√3	1	± 5.7 %	∞
Max. SAR Eval.	4.0	Rectangular	√3	1	± 2.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	30
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	30
Combined Standard Uncertainty					± 13.4 %	
Expanded Uncertainty (K=2)					± 26.8 %	

Uncertainty budget for frequency range 3 GHz to 6 GHz



FCC SAR Test Report

7. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Taiwan HwaYa EMC/RF/Safety/Telecom Lab:

Add: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil., Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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The road map of all our labs can be found in our web site also.

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Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

System Check_H2450_140320

DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: H2450_0320 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.861$ S/m; $\epsilon_r = 38.631$; $\rho = 1000$ kg/m³

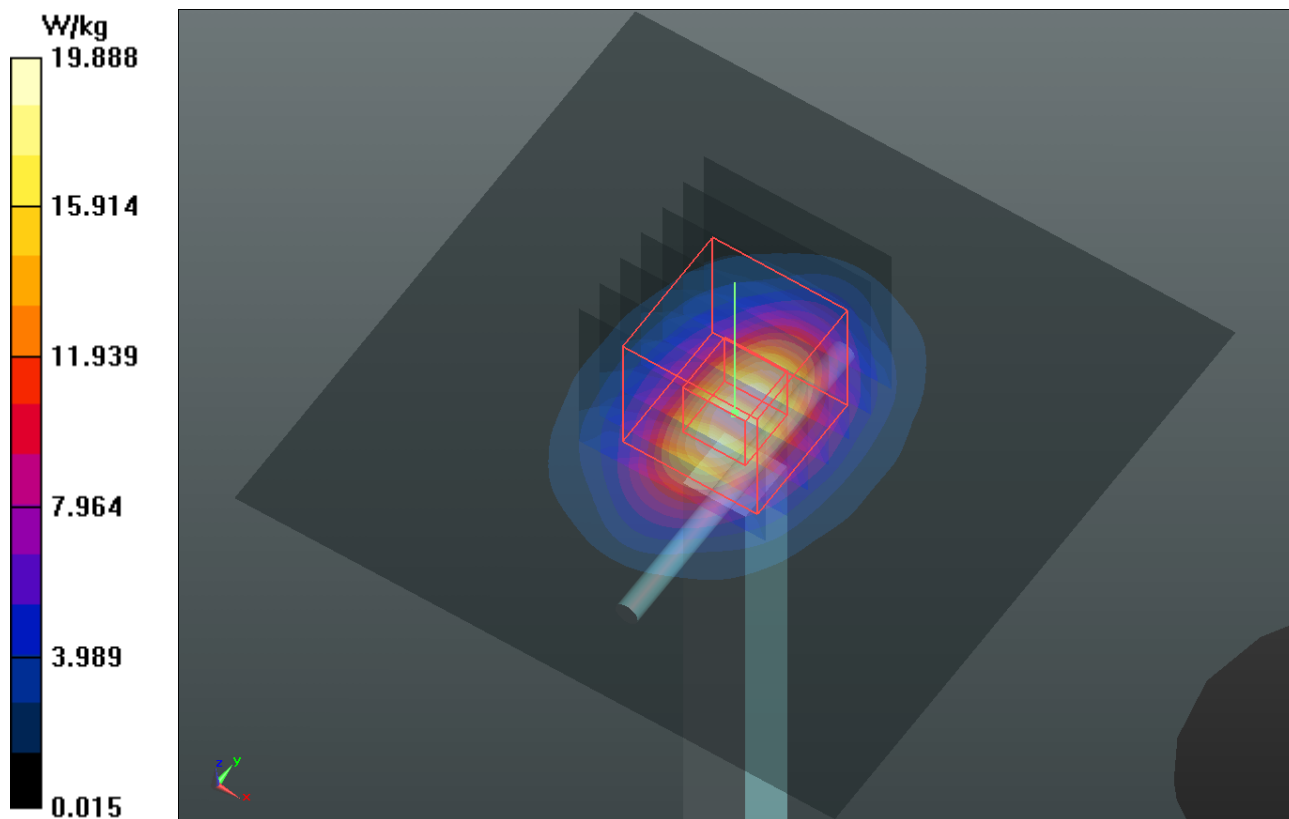
Ambient Temperature : 21.6°C; Liquid Temperature : 21.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(7.47, 7.47, 7.47); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.9 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.0 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.79 W/kg
Maximum value of SAR (measured) = 19.8 W/kg



System Check_H5200_140321

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: H5G_0321 Medium parameters used: $f = 5200$ MHz; $\sigma = 4.8$ S/m; $\epsilon_r = 35.629$; $\rho = 1000$ kg/m³

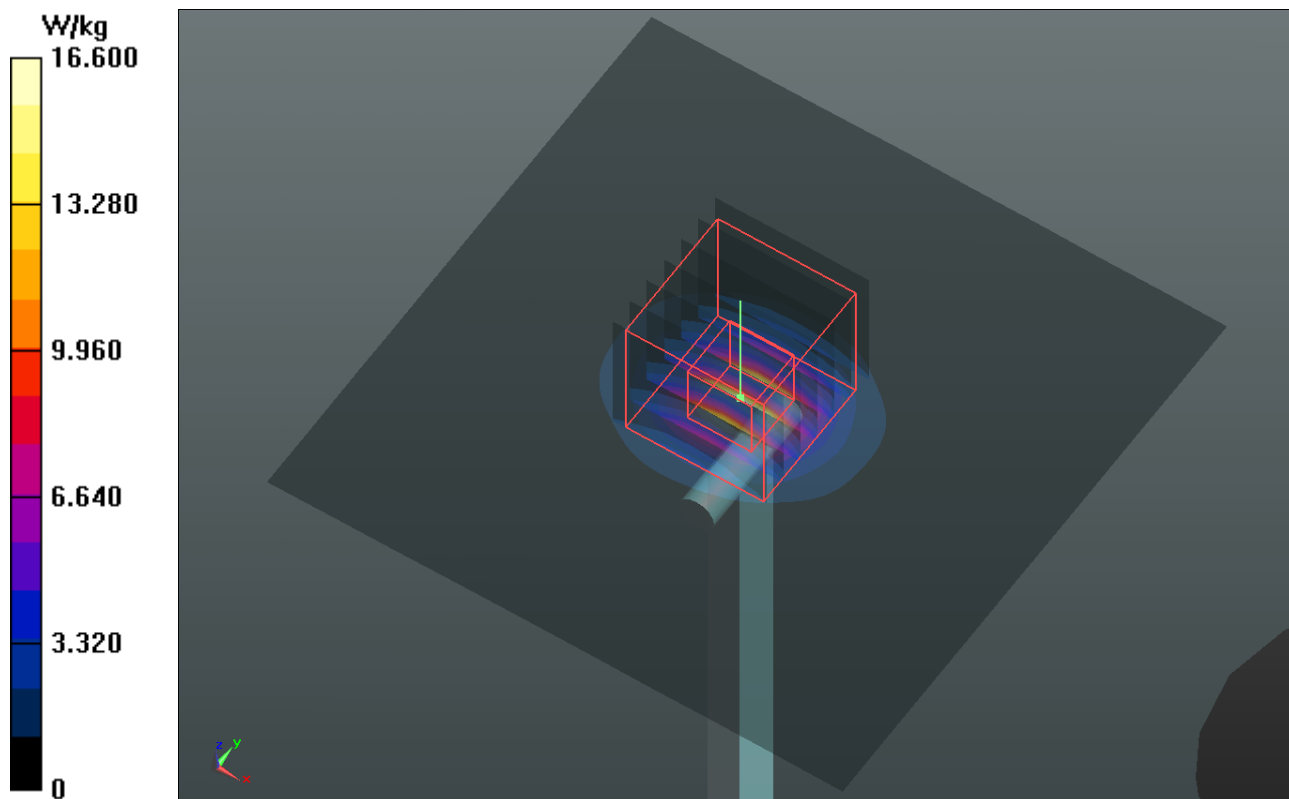
Ambient Temperature : 21.7°C; Liquid Temperature : 20.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(5.33, 5.33, 5.33); Calibrated: 2013/07/31
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 16.6 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 62.762 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 32.9 W/kg
SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 16.9 W/kg



System Check_H5300_140317

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: H5G_0317 Medium parameters used: $f = 5300$ MHz; $\sigma = 4.906$ S/m; $\epsilon_r = 35.237$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.2 °C; Liquid Temperature : 21.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(5.07, 5.07, 5.07); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1653
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 18.0 W/kg

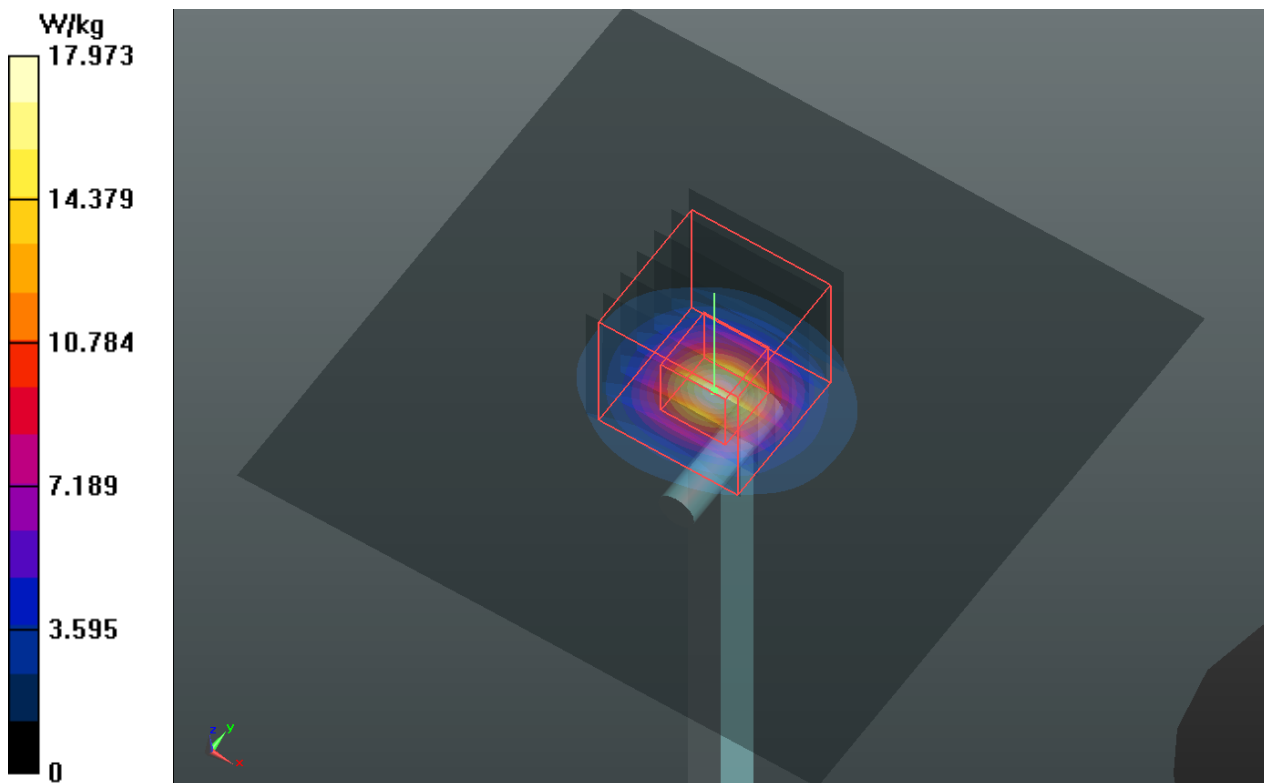
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 63.645 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 36.6 W/kg

SAR(1 g) = 8.5 W/kg; SAR(10 g) = 2.4 W/kg

Maximum value of SAR (measured) = 18.1 W/kg



System Check_H5600_140318

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: H5G_0318 Medium parameters used: $f = 5600$ MHz; $\sigma = 5.226$ S/m; $\epsilon_r = 34.677$; $\rho = 1000$ kg/m³

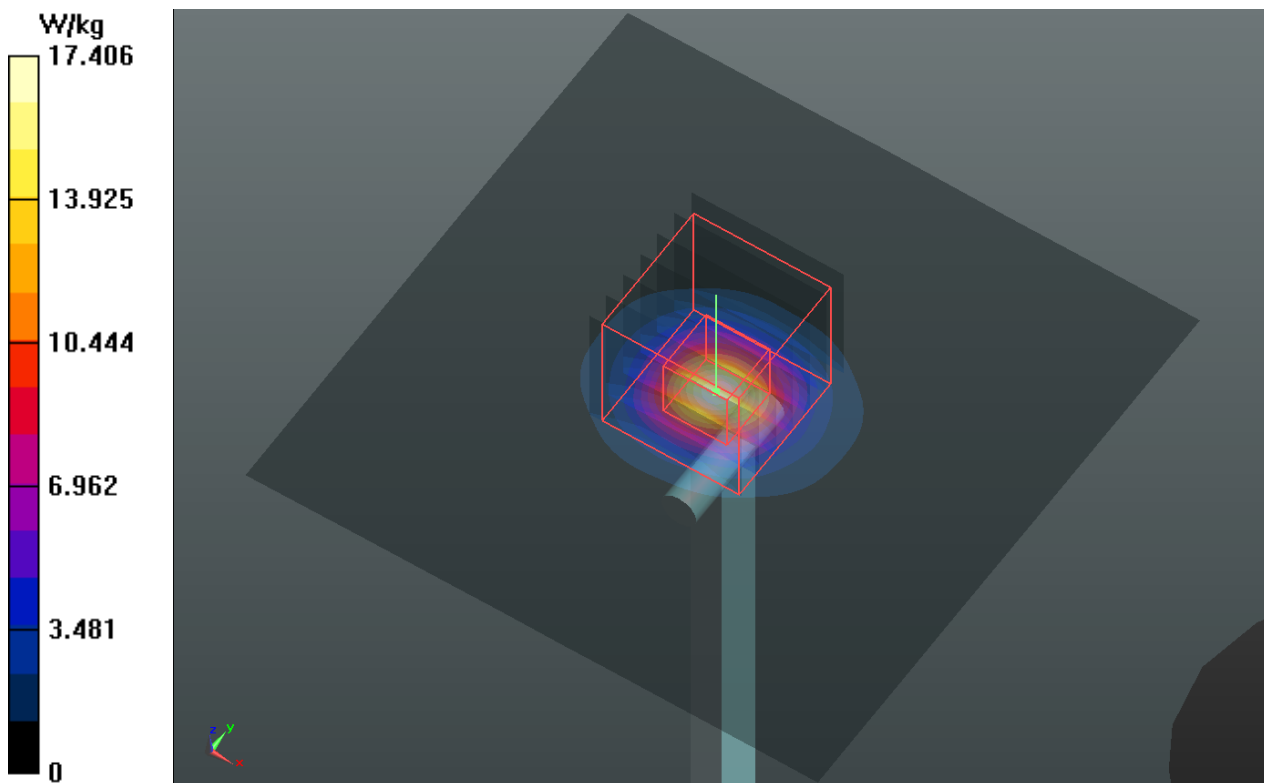
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.57, 4.57, 4.57); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1653
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.4 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 62.316 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 36.4 W/kg
SAR(1 g) = 8.26 W/kg; SAR(10 g) = 2.33 W/kg
Maximum value of SAR (measured) = 18.0 W/kg



System Check_H5800_140318

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: H5G_0318 Medium parameters used: $f = 5800$ MHz; $\sigma = 5.439$ S/m; $\epsilon_r = 34.384$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.56, 4.56, 4.56); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1653
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 16.0 W/kg

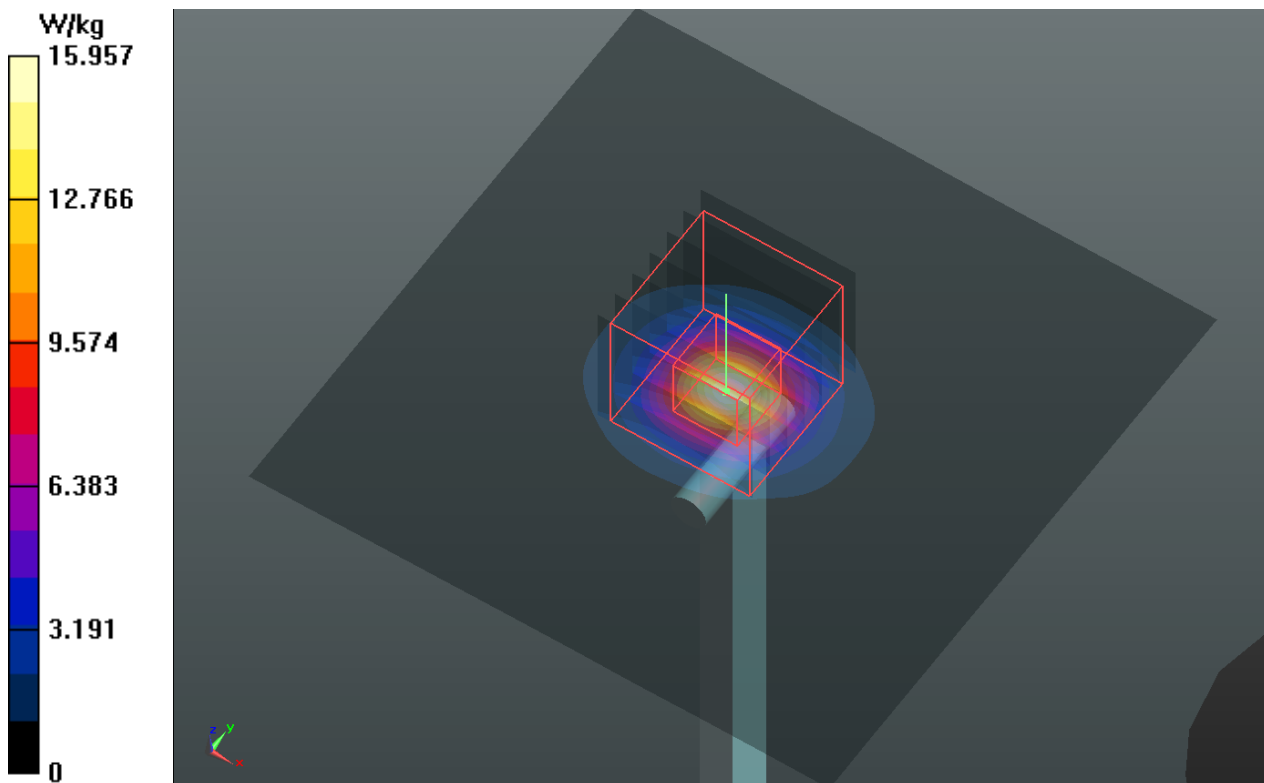
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 59.125 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 32.9 W/kg

SAR(1 g) = 7.61 W/kg; SAR(10 g) = 2.15 W/kg

Maximum value of SAR (measured) = 16.4 W/kg



System Check_B2450_140319

DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: B2450_0319 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.972$ S/m; $\epsilon_r = 51.404$; $\rho = 1000$ kg/m³

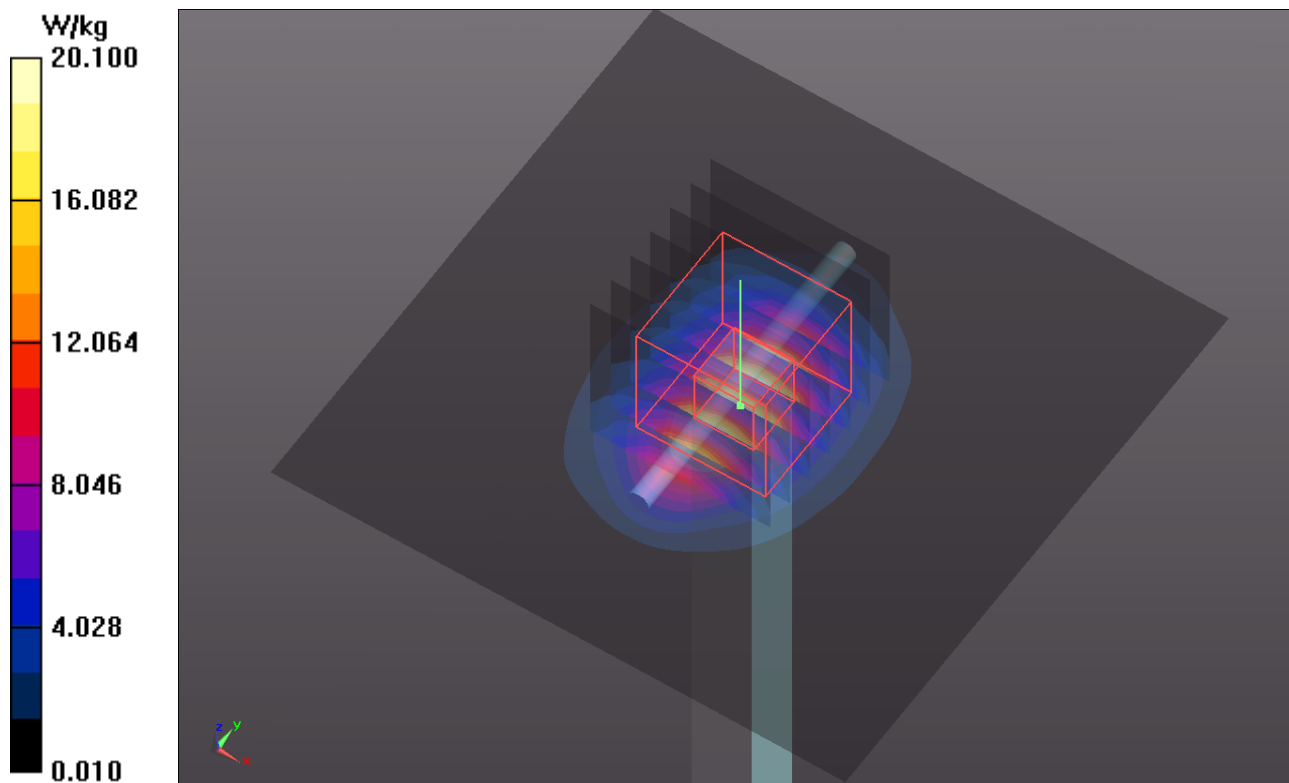
Ambient Temperature : 22.7°C; Liquid Temperature : 21.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(7.4, 7.4, 7.4); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: Flat Phantom ELI 5.0_Back; Type: QDOVA001BB; Serial: SN:1204
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.1 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.2 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 27.5 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 5.98 W/kg
Maximum value of SAR (measured) = 20.2 W/kg



System Check_B5200_140321

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: B5G_0321 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.35$ S/m; $\epsilon_r = 47.721$; $\rho = 1000$ kg/m³

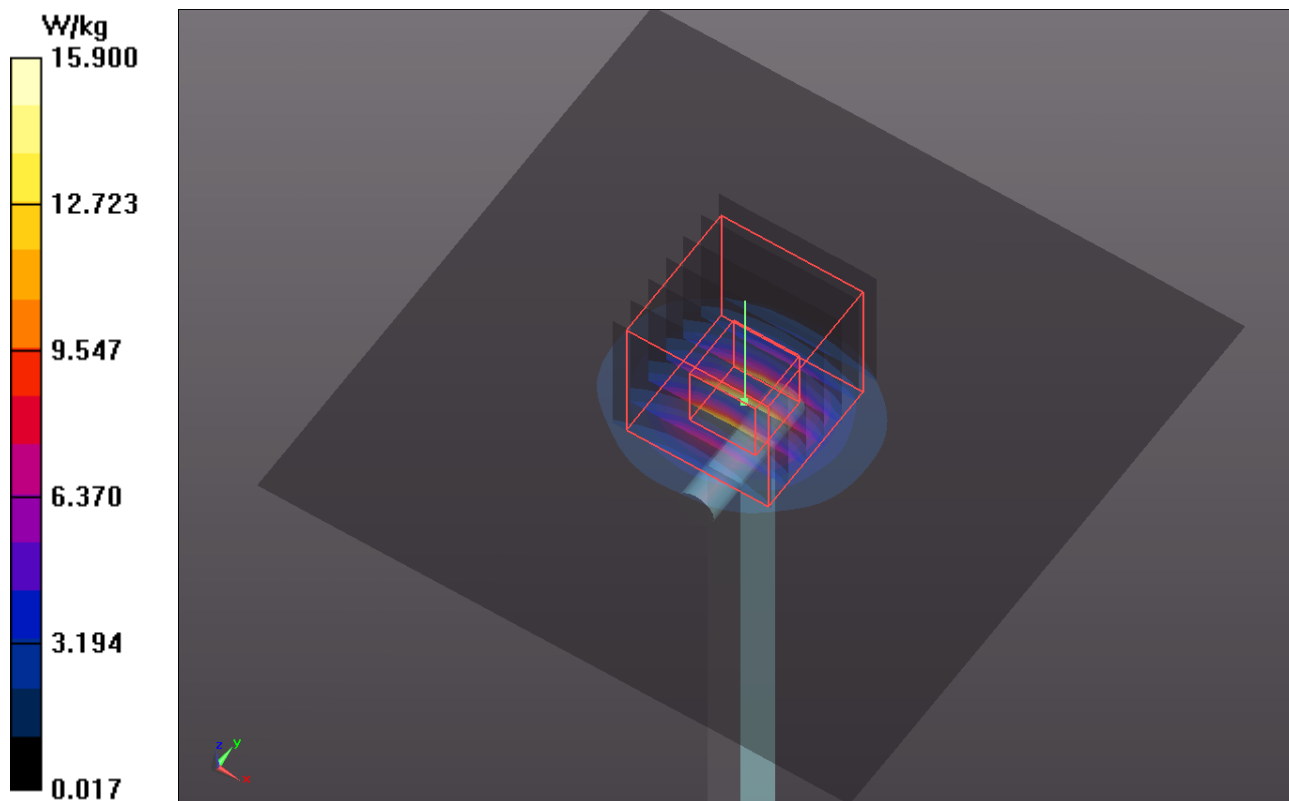
Ambient Temperature : 21.1°C; Liquid Temperature : 20.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(4.49, 4.49, 4.49); Calibrated: 2013/07/31
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: Flat Phantom ELI 5.0_Back; Type: QDOVA001BB; Serial: SN:1204
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.9 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 58.693 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 28.8 W/kg
SAR(1 g) = 7.46 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 15.3 W/kg



System Check_B5300_140319

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: B5G_0319 Medium parameters used: $f = 5300$ MHz; $\sigma = 5.322$ S/m; $\epsilon_r = 48.374$; $\rho = 1000$ kg/m³

Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.31, 4.31, 4.31); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 14.8 W/kg

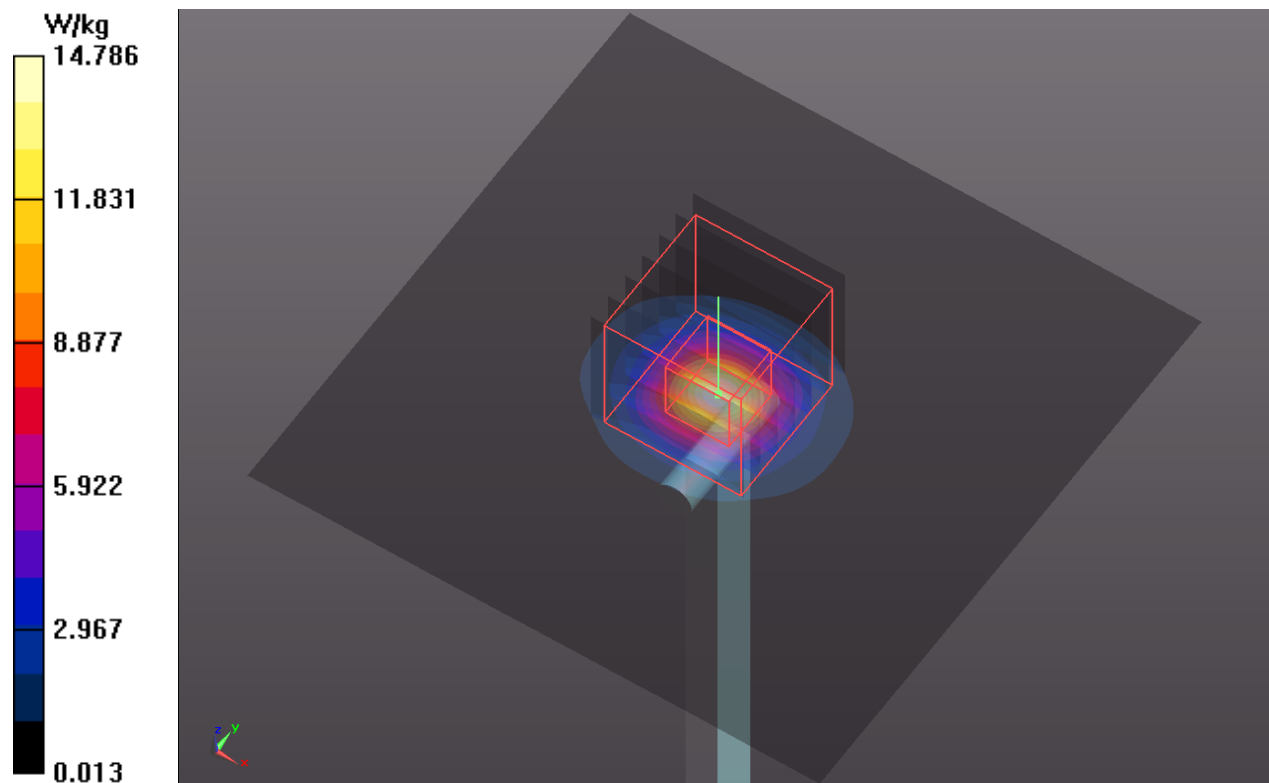
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 56.770 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 28.5 W/kg

SAR(1 g) = 6.98 W/kg; SAR(10 g) = 1.98 W/kg

Maximum value of SAR (measured) = 14.5 W/kg



System Check_B5600_140319

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: B5G_0319 Medium parameters used: $f = 5600$ MHz; $\sigma = 5.753$ S/m; $\epsilon_r = 47.615$; $\rho = 1000$ kg/m³

Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4, 4, 4); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 15.1 W/kg

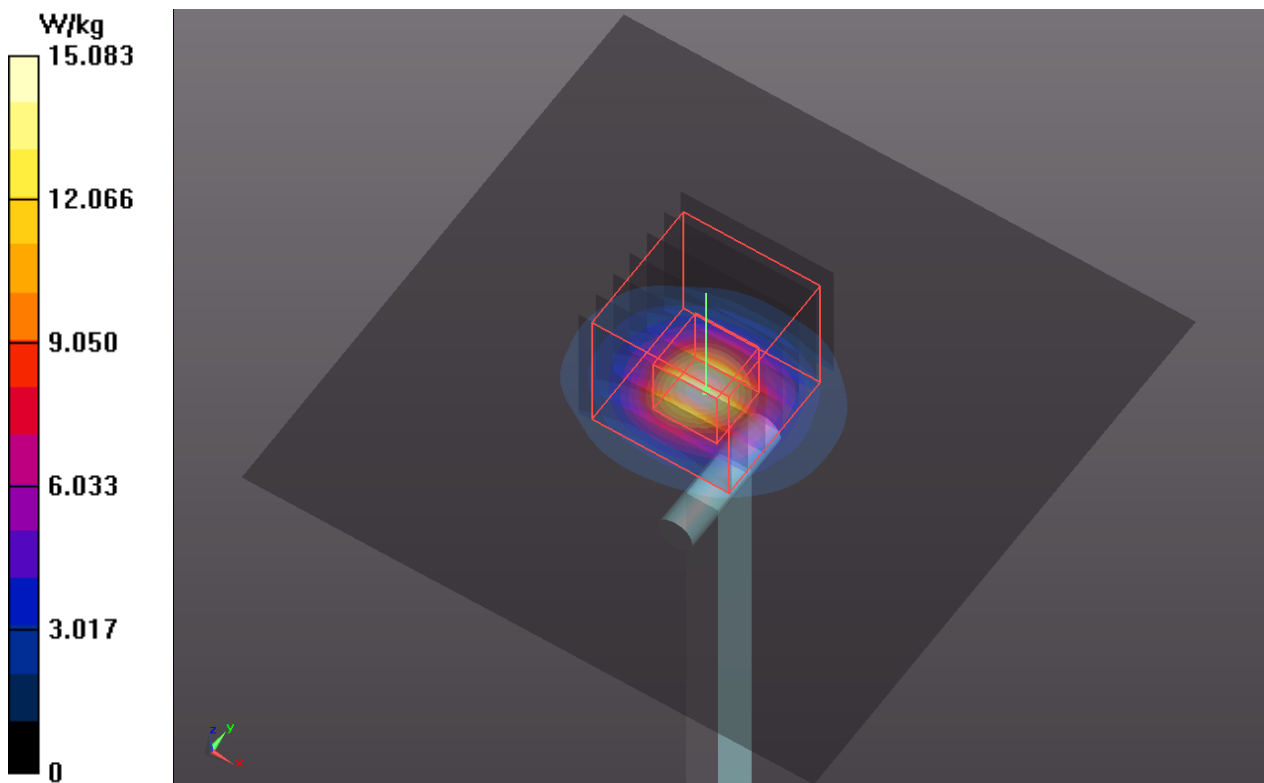
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 55.416 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.55 W/kg; SAR(10 g) = 2.14 W/kg

Maximum value of SAR (measured) = 16.0 W/kg



System Check_B5800_140319

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1018

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: B5G_0319 Medium parameters used: $f = 5800$ MHz; $\sigma = 5.952$ S/m; $\epsilon_r = 47.421$; $\rho = 1000$ kg/m³

Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.21, 4.21, 4.21); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 14.4 W/kg

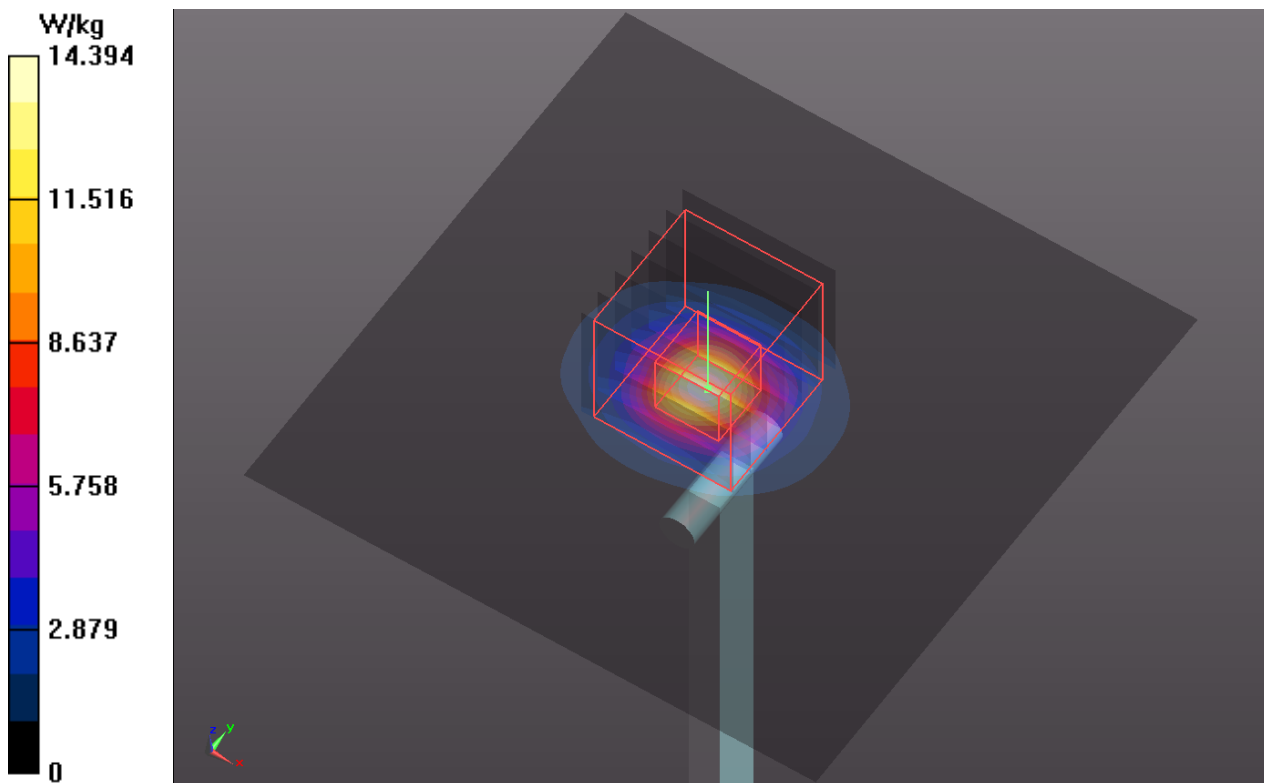
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 54.307 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 29.8 W/kg

SAR(1 g) = 7.07 W/kg; SAR(10 g) = 2 W/kg

Maximum value of SAR (measured) = 15.1 W/kg





Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

P01 802.11b_Left Cheek_Ch6

DUT: 140219C09

Communication System: WLAN_2.4G; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: H2450_0320 Medium parameters used: $f = 2437$ MHz; $\sigma = 1.847$ S/m; $\epsilon_r = 38.652$; $\rho =$

1000 kg/m³

Ambient Temperature : 21.6°C; Liquid Temperature : 21.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(7.47, 7.47, 7.47); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (101x161x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.484 W/kg

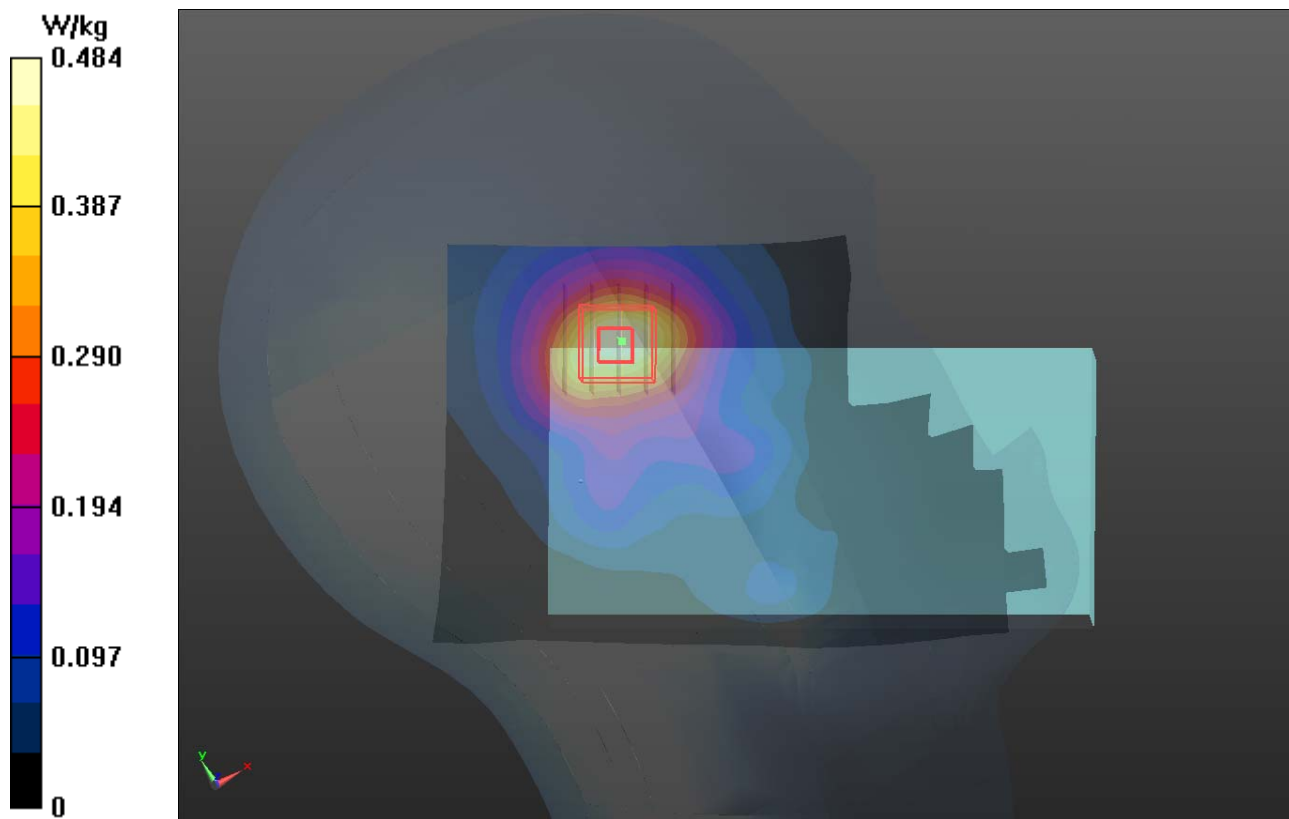
- **Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.910 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.622 W/kg

SAR(1 g) = 0.349 W/kg; SAR(10 g) = 0.195 W/kg

Maximum value of SAR (measured) = 0.486 W/kg



P02 802.11a_Left Cheek_Ch36

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5180 MHz; Duty Cycle: 1:1.13

Medium: H5G_0321 Medium parameters used: $f = 5180$ MHz; $\sigma = 4.786$ S/m; $\epsilon_r = 35.638$; $\rho = 1000$ kg/m³

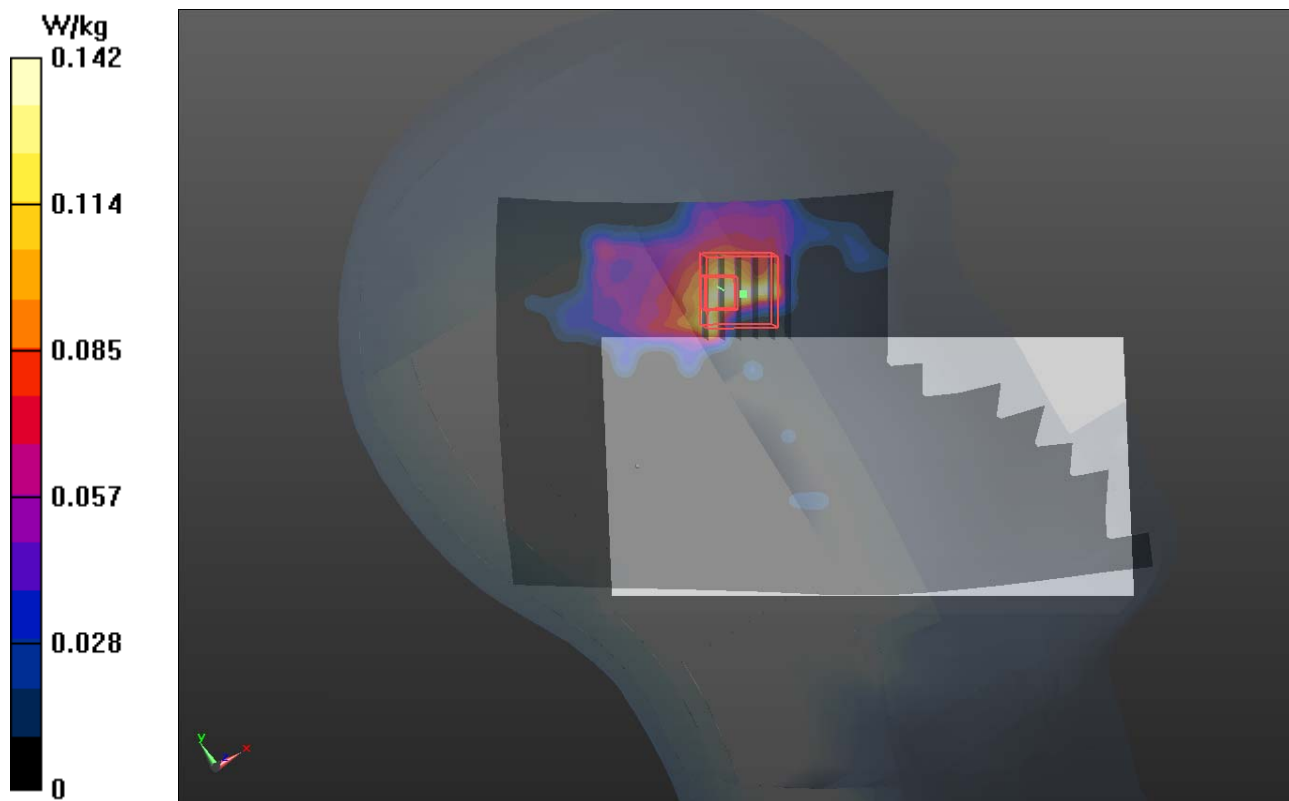
Ambient Temperature : 21.7°C; Liquid Temperature : 20.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(5.33, 5.33, 5.33); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (121x201x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.142 W/kg

- **Zoom Scan (6x6x12)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 0 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.177 W/kg
SAR(1 g) = 0.061 W/kg; SAR(10 g) = 0.020 W/kg
Maximum value of SAR (measured) = 0.118 W/kg



P03 802.11a_Left Cheek_Ch60

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5300 MHz; Duty Cycle: 1:1.13

Medium: H5G_0317 Medium parameters used: $f = 5300$ MHz; $\sigma = 4.906$ S/m; $\epsilon_r = 35.237$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.2 °C; Liquid Temperature : 21.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(5.07, 5.07, 5.07); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1653
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (111x171x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.206 W/kg

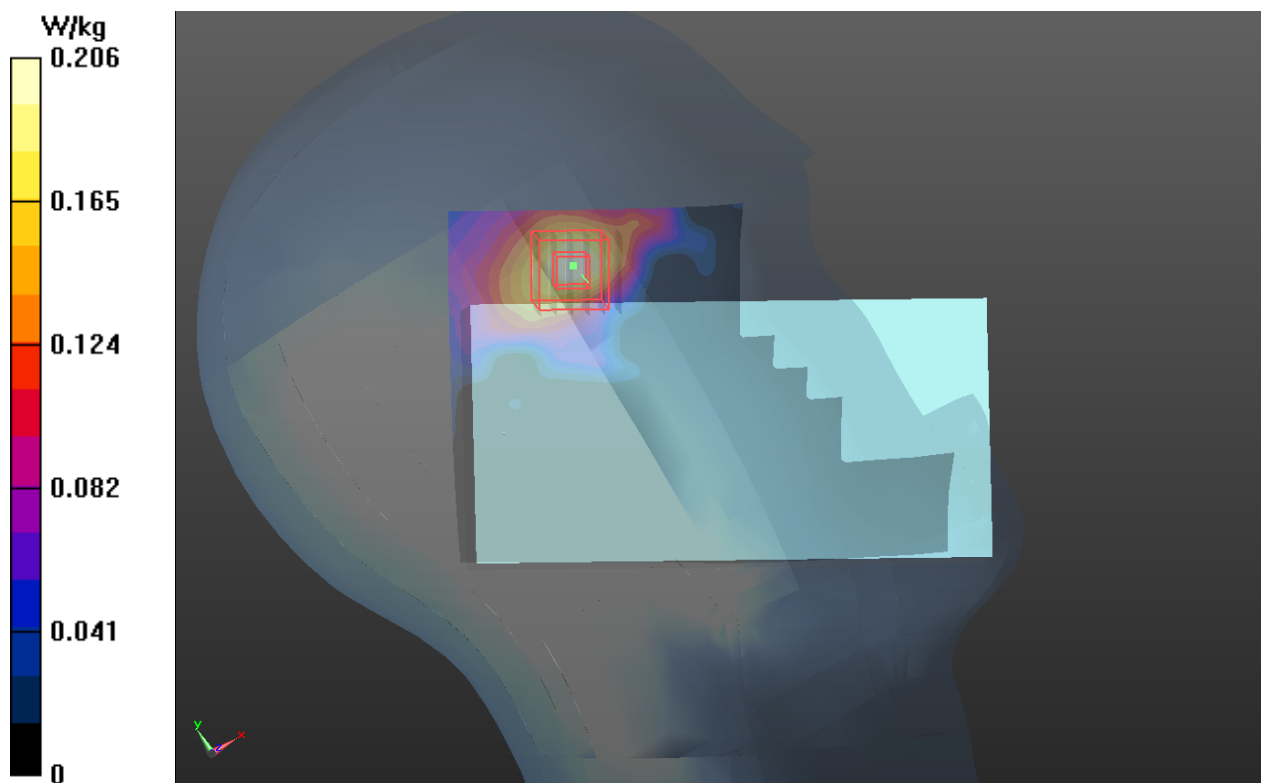
- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 1.471 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.430 W/kg

SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.052 W/kg

Maximum value of SAR (measured) = 0.201 W/kg



P04 802.11a_Left Cheek_Ch136

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5680 MHz; Duty Cycle: 1:1.13

Medium: H5G_0318 Medium parameters used: $f = 5680$ MHz; $\sigma = 5.305$ S/m; $\epsilon_r = 34.587$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.57, 4.57, 4.57); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1653
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (111x171x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

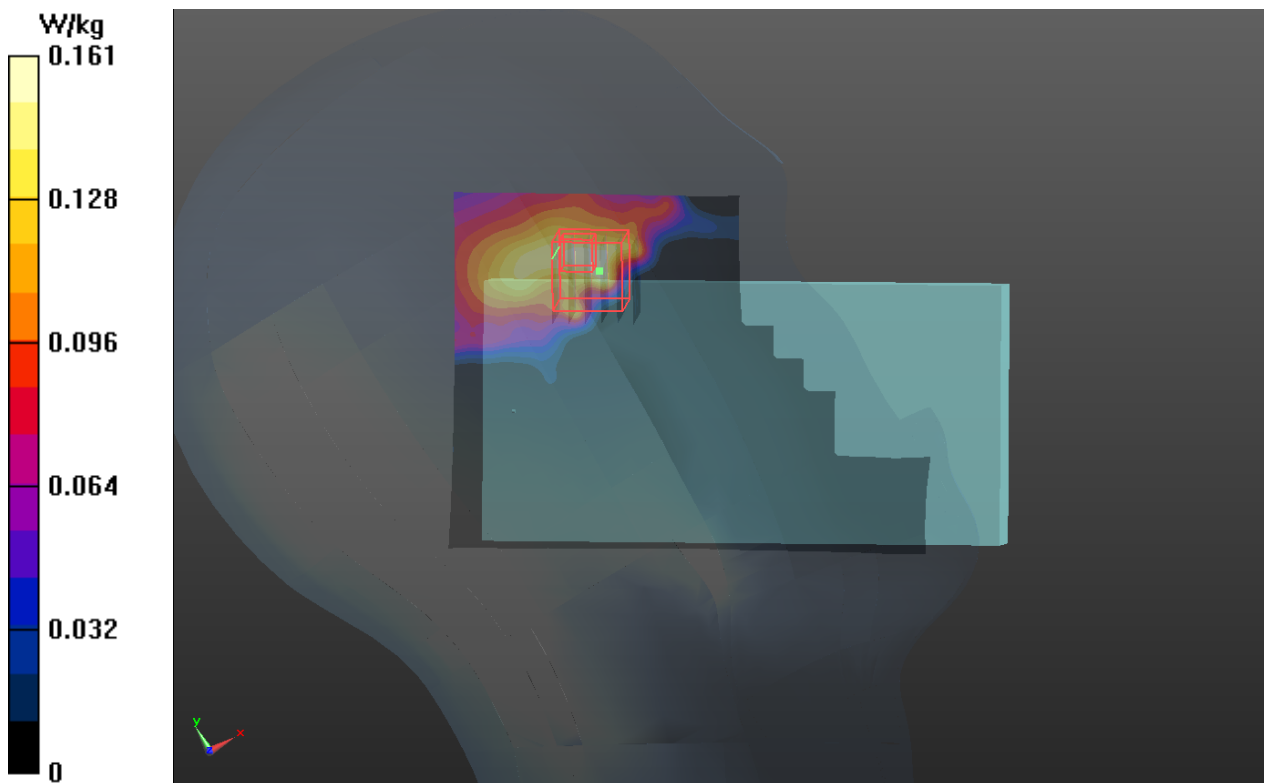
- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 1.138 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.511 W/kg

SAR(1 g) = 0.087 W/kg; SAR(10 g) = 0.035 W/kg

Maximum value of SAR (measured) = 0.153 W/kg



P05 802.11a_Left Cheek_Ch165

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5825 MHz; Duty Cycle: 1:1.13

Medium: H5G_0318 Medium parameters used: $f = 5825$ MHz; $\sigma = 5.477$ S/m; $\epsilon_r = 34.278$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.56, 4.56, 4.56); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1653
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (111x171x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.172 W/kg

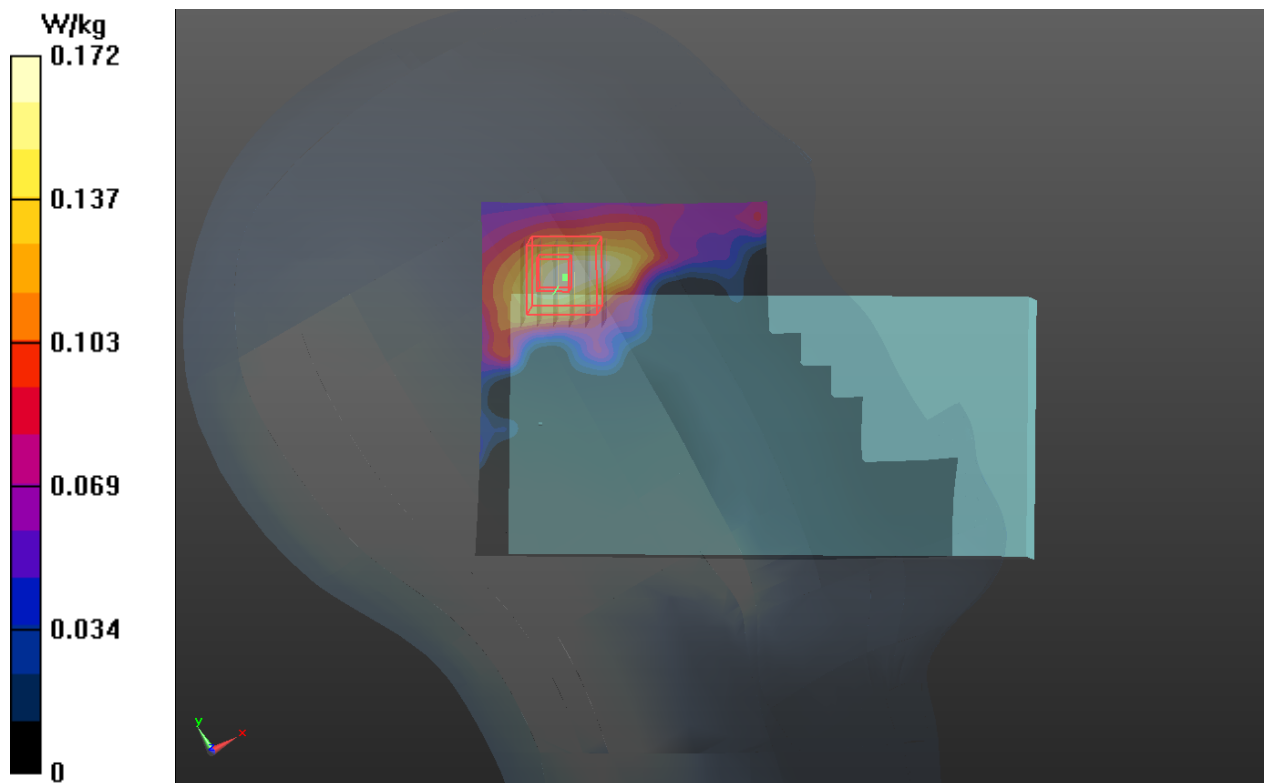
- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 0.857 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.309 W/kg

SAR(1 g) = 0.084 W/kg; SAR(10 g) = 0.038 W/kg

Maximum value of SAR (measured) = 0.152 W/kg



P06 802.11b_Rear Face_1.5cm_Ch6

DUT: 140219C09

Communication System: WLAN_2.4G; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: B2450_0319 Medium parameters used: $f = 2437$ MHz; $\sigma = 1.951$ S/m; $\epsilon_r = 51.41$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.7°C; Liquid Temperature : 21.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(7.4, 7.4, 7.4); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: Flat Phantom ELI 5.0_Back; Type: QDOVA001BB; Serial: SN:1204
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (101x161x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.146 W/kg

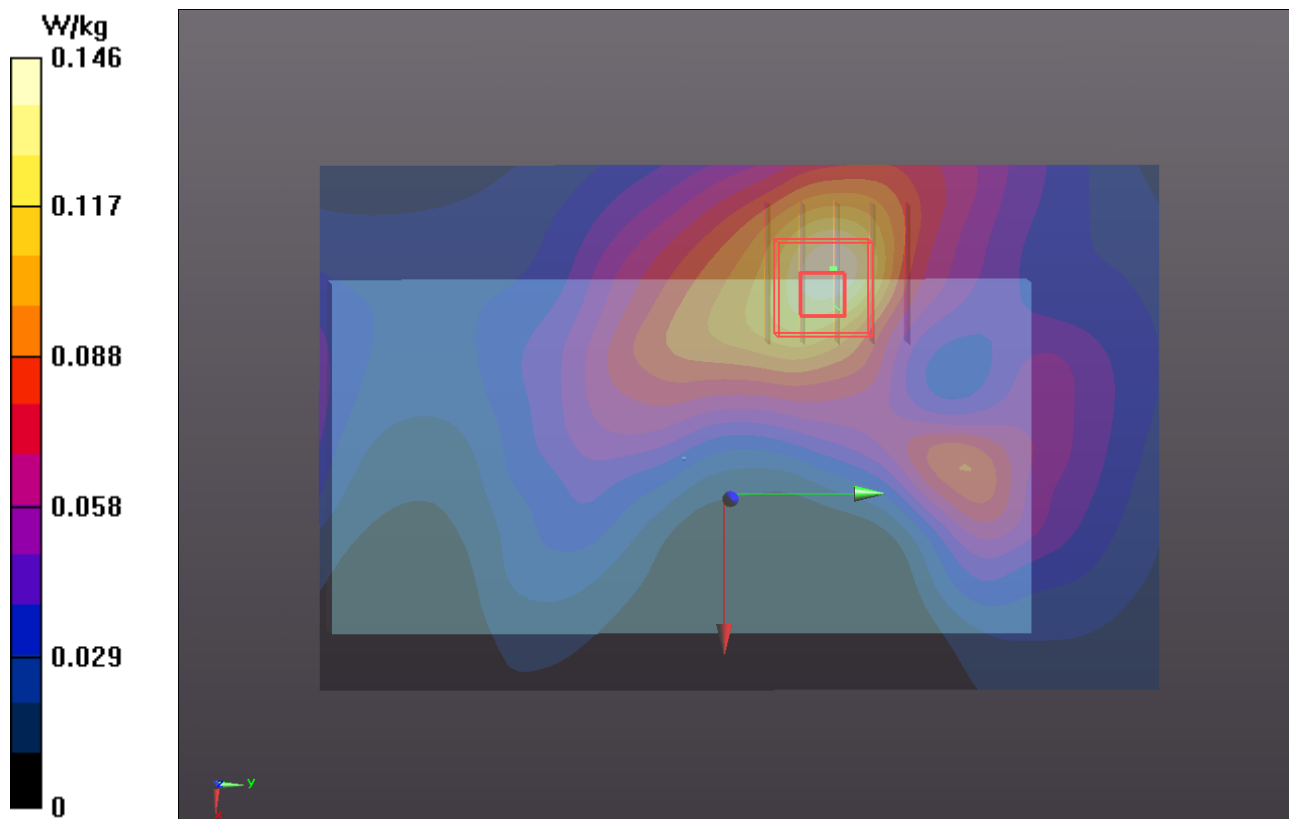
- **Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.702 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.188 W/kg

SAR(1 g) = 0.109 W/kg; SAR(10 g) = 0.064 W/kg

Maximum value of SAR (measured) = 0.145 W/kg



P07 802.11a_Rear Face_1.5cm_Ch36

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5180 MHz; Duty Cycle: 1:1.13

Medium: B5G_0321 Medium parameters used: $f = 5180$ MHz; $\sigma = 5.325$ S/m; $\epsilon_r = 47.829$; $\rho = 1000$ kg/m³

Ambient Temperature : 21.1°C; Liquid Temperature : 20.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(4.49, 4.49, 4.49); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: Flat Phantom ELI 5.0_Back; Type: QDOVA001BB; Serial: SN:1204
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- Area Scan (141x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.389 W/kg

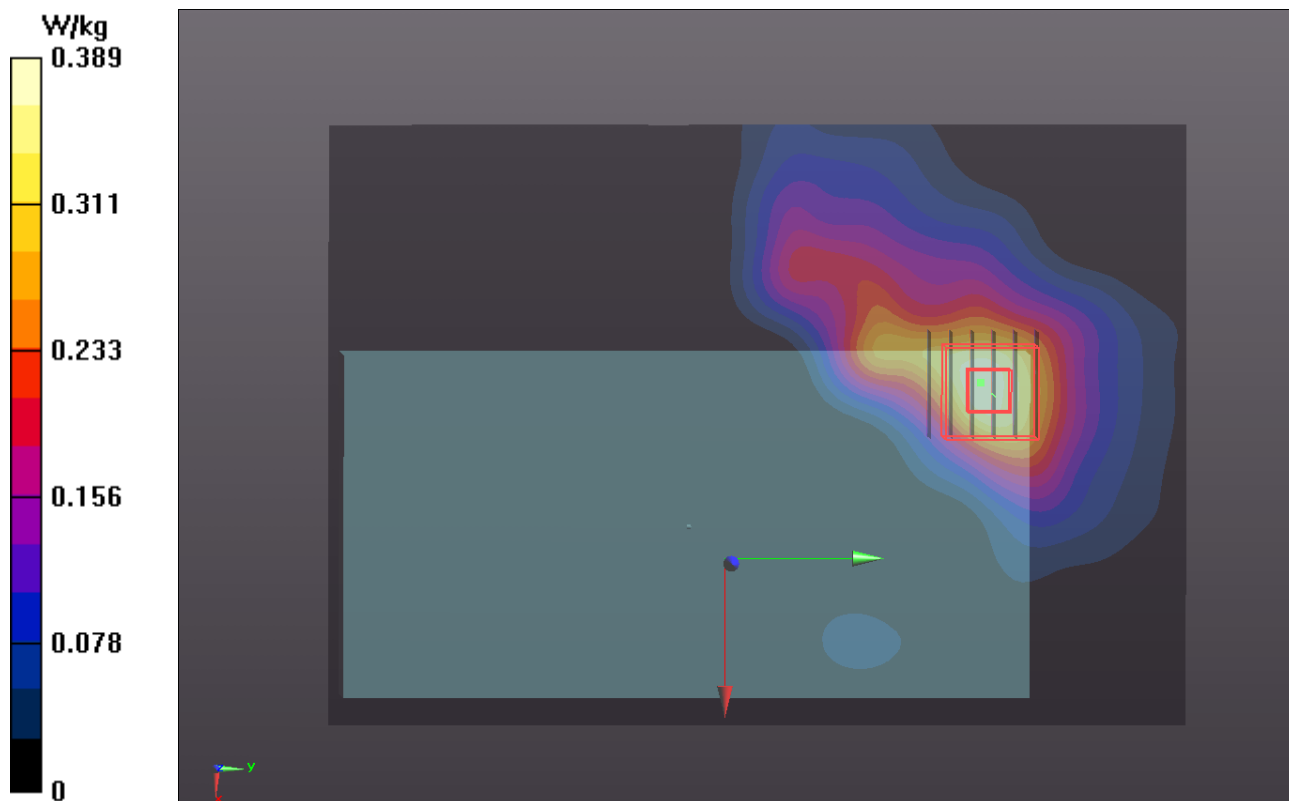
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 0.967 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.744 W/kg

SAR(1 g) = 0.228 W/kg; SAR(10 g) = 0.093 W/kg

Maximum value of SAR (measured) = 0.410 W/kg



P08 802.11a_Rear Face_1.5cm_Ch60

DUT: 140219C09

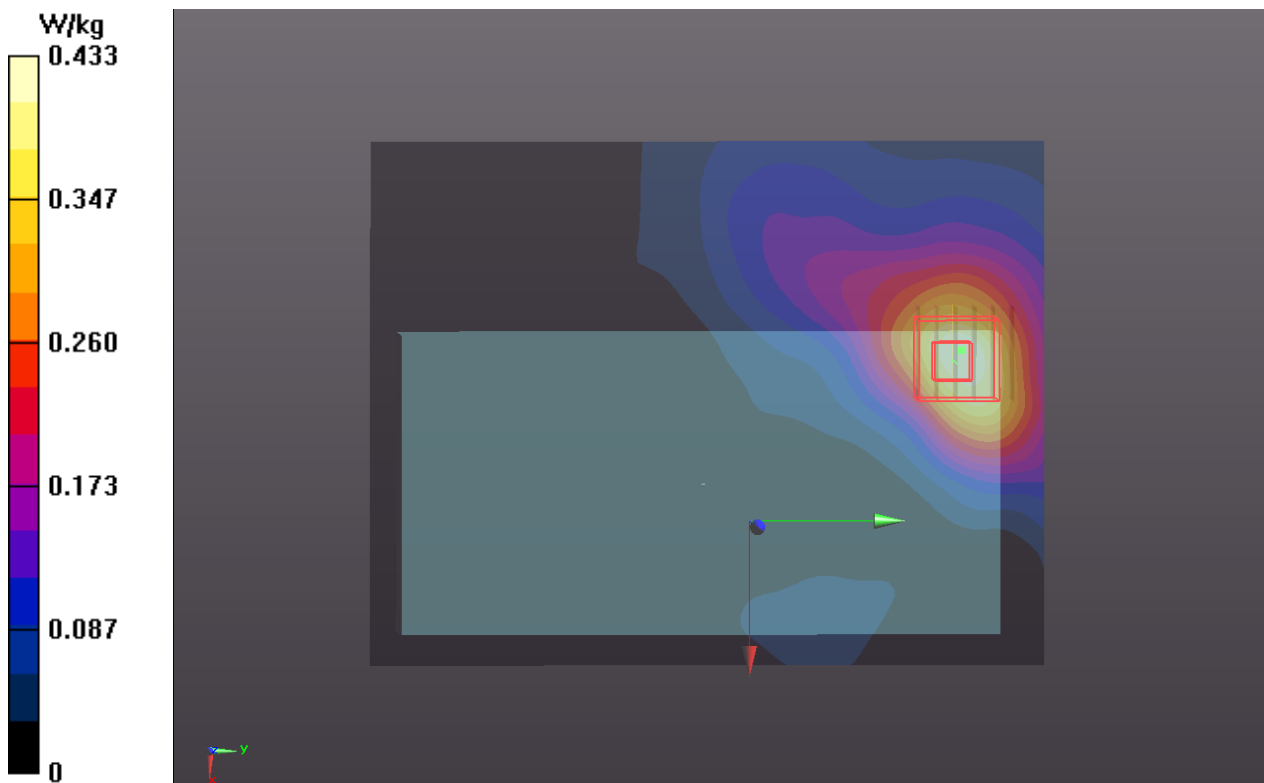
Communication System: WLAN_5G; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: B5G_0319 Medium parameters used: $f = 5300$ MHz; $\sigma = 5.322$ S/m; $\epsilon_r = 48.374$; $\rho = 1000$ kg/m³
Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.31, 4.31, 4.31); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (141x181x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.433 W/kg

- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 0.852 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.831 W/kg
SAR(1 g) = 0.268 W/kg; SAR(10 g) = 0.118 W/kg
Maximum value of SAR (measured) = 0.453 W/kg



P09 802.11a_Rear Face_1.5cm_Ch136

DUT: 140219C09

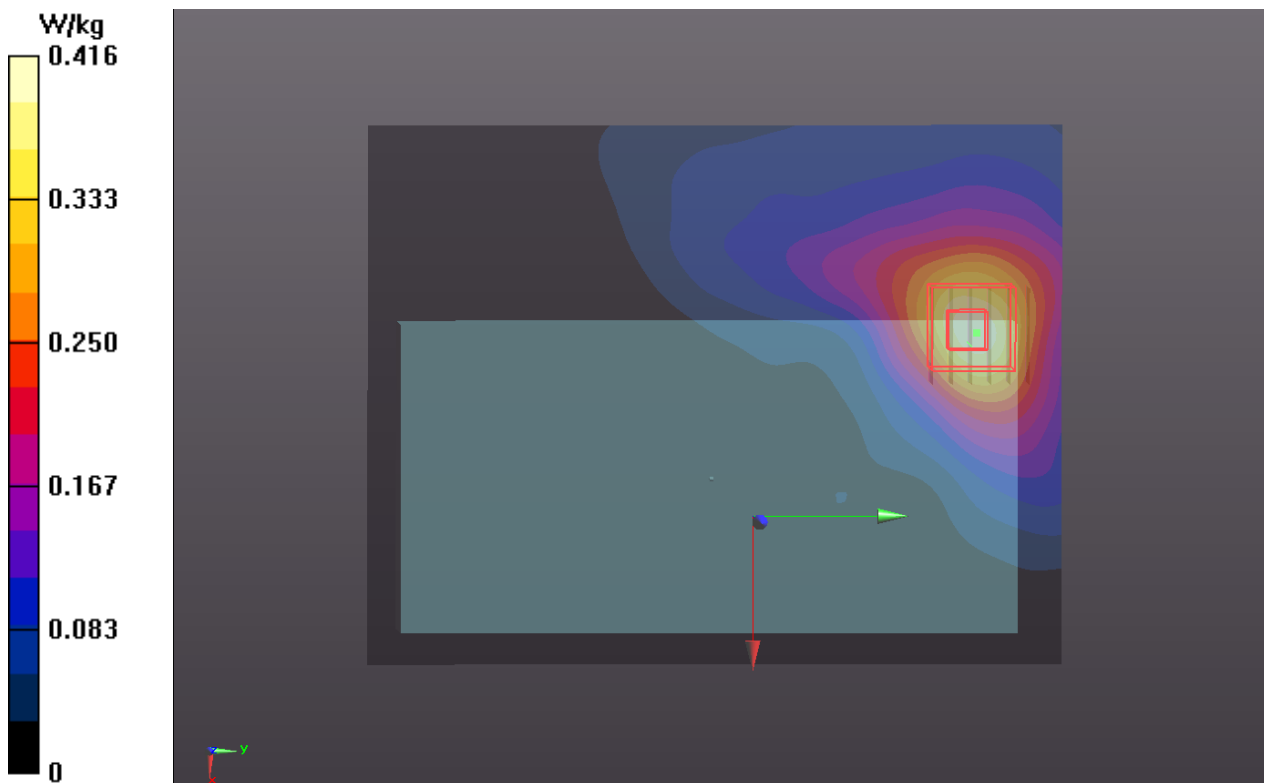
Communication System: WLAN_5G; Frequency: 5680 MHz; Duty Cycle: 1:1.13
Medium: B5G_0319 Medium parameters used: $f = 5680$ MHz; $\sigma = 5.765$ S/m; $\epsilon_r = 47.601$; $\rho = 1000$ kg/m³
Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4, 4, 4); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (141x181x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.416 W/kg

- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 1.141 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.240 W/kg; SAR(10 g) = 0.104 W/kg
Maximum value of SAR (measured) = 0.418 W/kg



P10 802.11a_Rear Face_1.5cm_Ch165

DUT: 140219C09

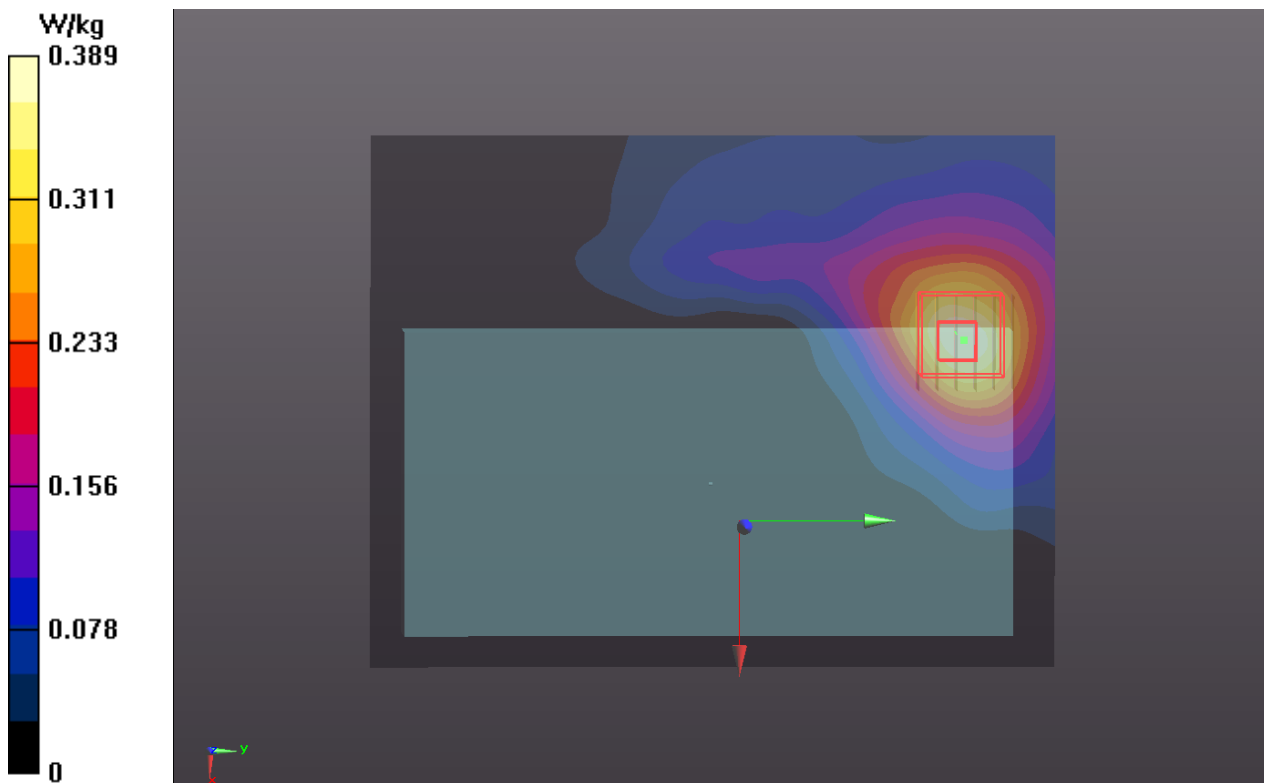
Communication System: WLAN_5G; Frequency: 5825 MHz; Duty Cycle: 1:1.13
Medium: B5G_0319 Medium parameters used: $f = 5825$ MHz; $\sigma = 6.059$ S/m; $\epsilon_r = 47.186$; $\rho = 1000$ kg/m³
Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.21, 4.21, 4.21); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (141x181x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.389 W/kg

- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 0.990 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.742 W/kg
SAR(1 g) = 0.223 W/kg; SAR(10 g) = 0.097 W/kg
Maximum value of SAR (measured) = 0.392 W/kg



P11 802.11b_Front Face_0cm_Ch6_EUT+Holster

DUT: 140219C09

Communication System: WLAN_2.4G; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: B2450_0319 Medium parameters used: $f = 2437$ MHz; $\sigma = 1.951$ S/m; $\epsilon_r = 51.41$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.7°C; Liquid Temperature : 21.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(7.4, 7.4, 7.4); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: Flat Phantom ELI 5.0_Back; Type: QDOVA001BB; Serial: SN:1204
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (91x161x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

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

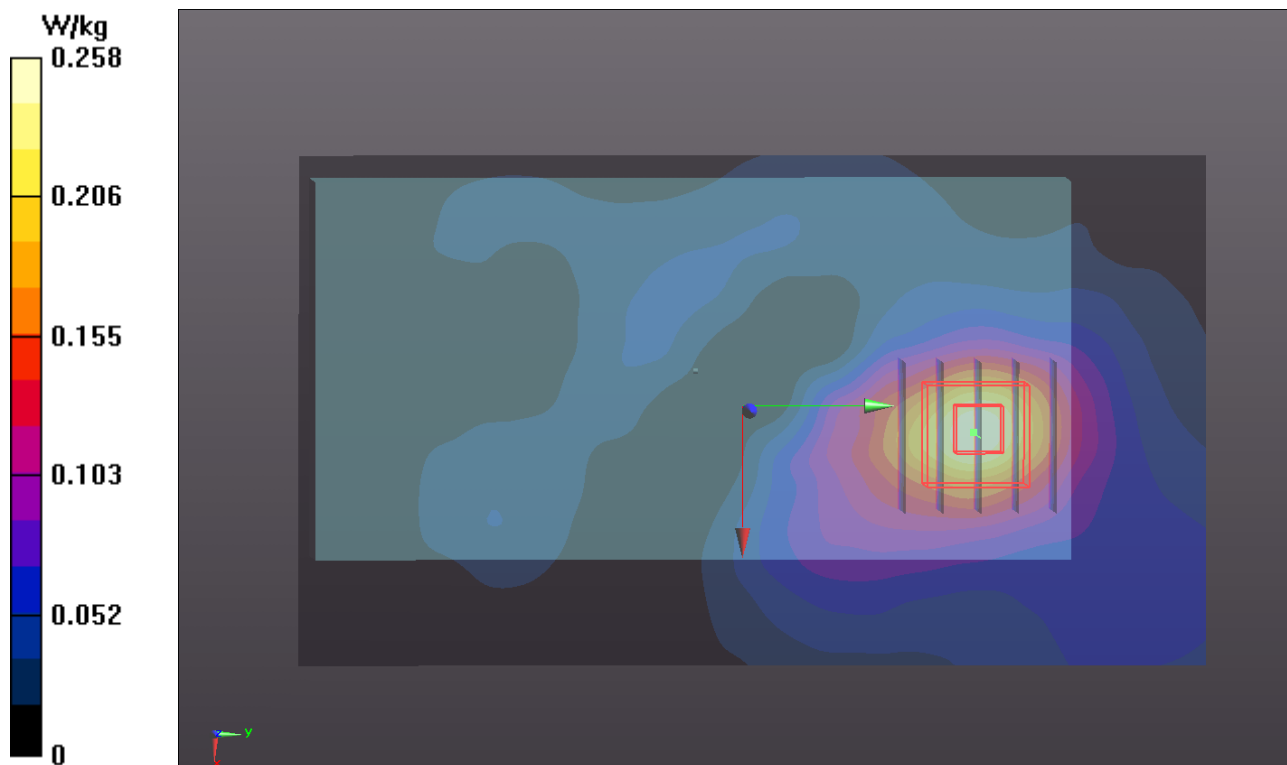
- **Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.691 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.334 W/kg

SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.106 W/kg

Maximum value of SAR (measured) = 0.262 W/kg



P12 802.11a_Front Face_0cm_Ch36_EUT+Holster

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5180 MHz; Duty Cycle: 1:1.13

Medium: B5G_0321 Medium parameters used: $f = 5180$ MHz; $\sigma = 5.325$ S/m; $\epsilon_r = 47.829$; $\rho = 1000$ kg/m³

Ambient Temperature : 21.1°C; Liquid Temperature : 20.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3864; ConvF(4.49, 4.49, 4.49); Calibrated: 2013/07/31;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2013/07/26
- Phantom: Flat Phantom ELI 5.0_Back; Type: QDOVA001BB; Serial: SN:1204
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- Area Scan (141x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0553 W/kg

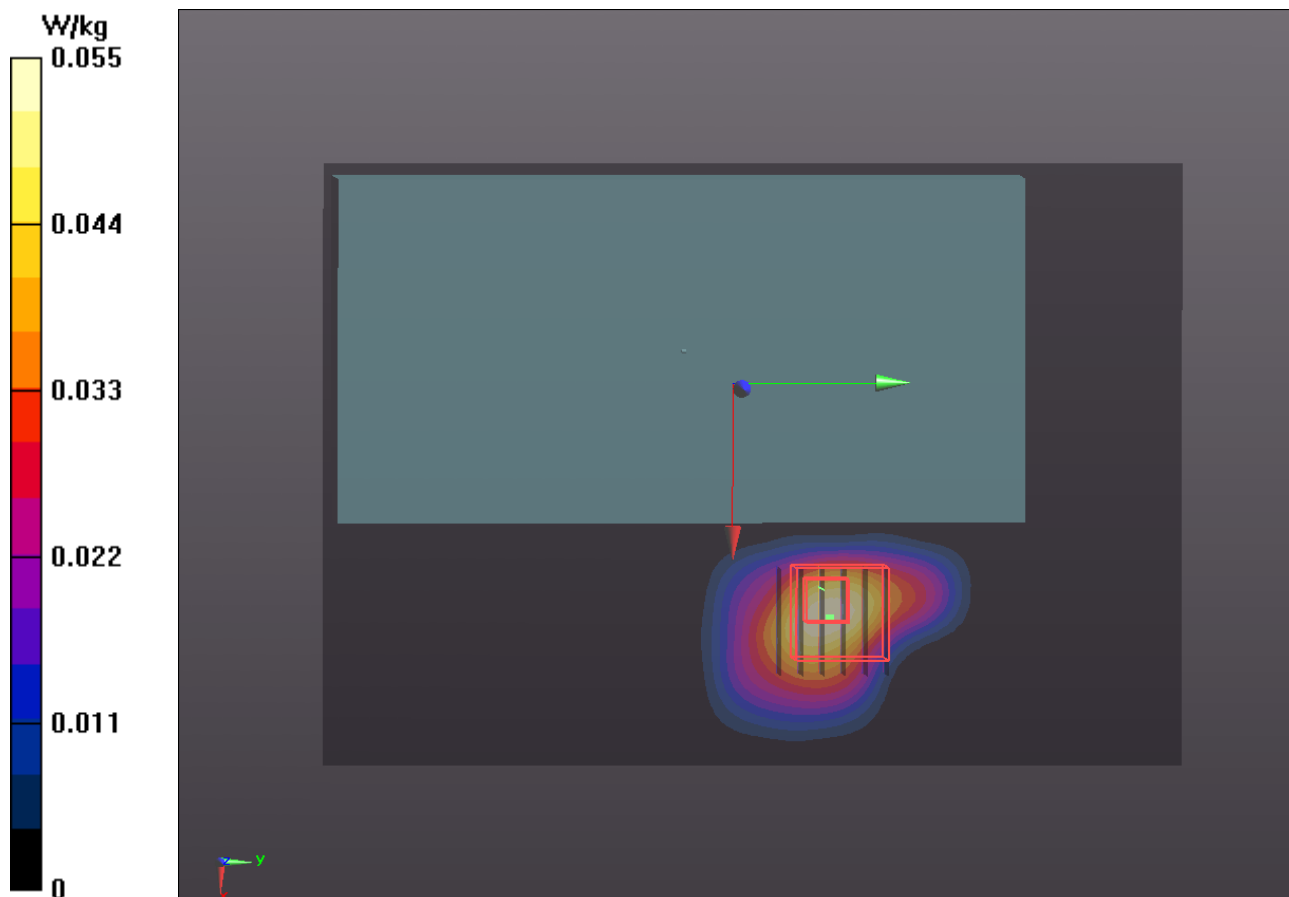
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 0 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.114 W/kg

SAR(1 g) = 0.020 W/kg; SAR(10 g) = 0.00843 W/kg

Maximum value of SAR (measured) = 0.0480 W/kg



P13 802.11a_Front Face_0cm_Ch60_EUT+Holster

DUT: 140219C09

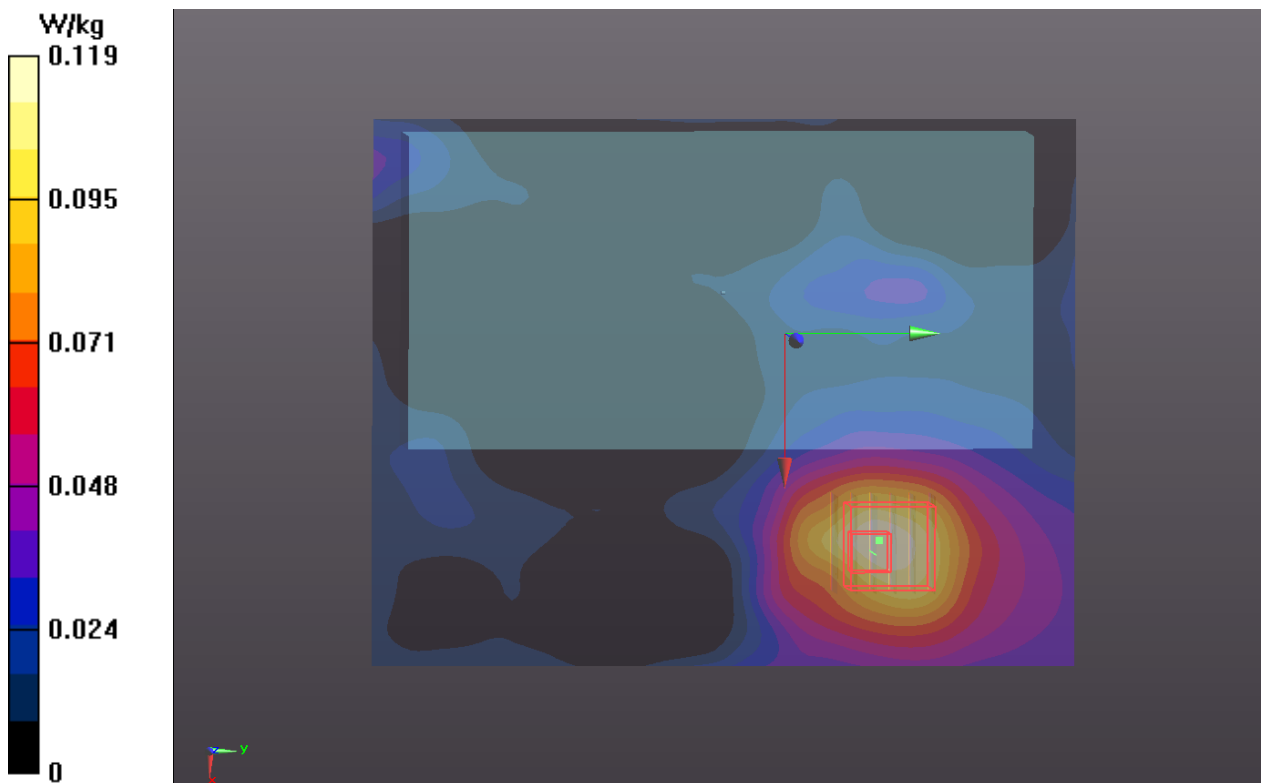
Communication System: WLAN_5G; Frequency: 5300 MHz; Duty Cycle: 1:1.13
Medium: B5G_0319 Medium parameters used: $f = 5300$ MHz; $\sigma = 5.322$ S/m; $\epsilon_r = 48.374$; $\rho = 1000$ kg/m³
Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.31, 4.31, 4.31); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (141x181x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.119 W/kg

- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 1.245 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.225 W/kg
SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.035 W/kg
Maximum value of SAR (measured) = 0.121 W/kg



P14 802.11a_Front Face_0cm_Ch136_EUT+Holster

DUT: 140219C09

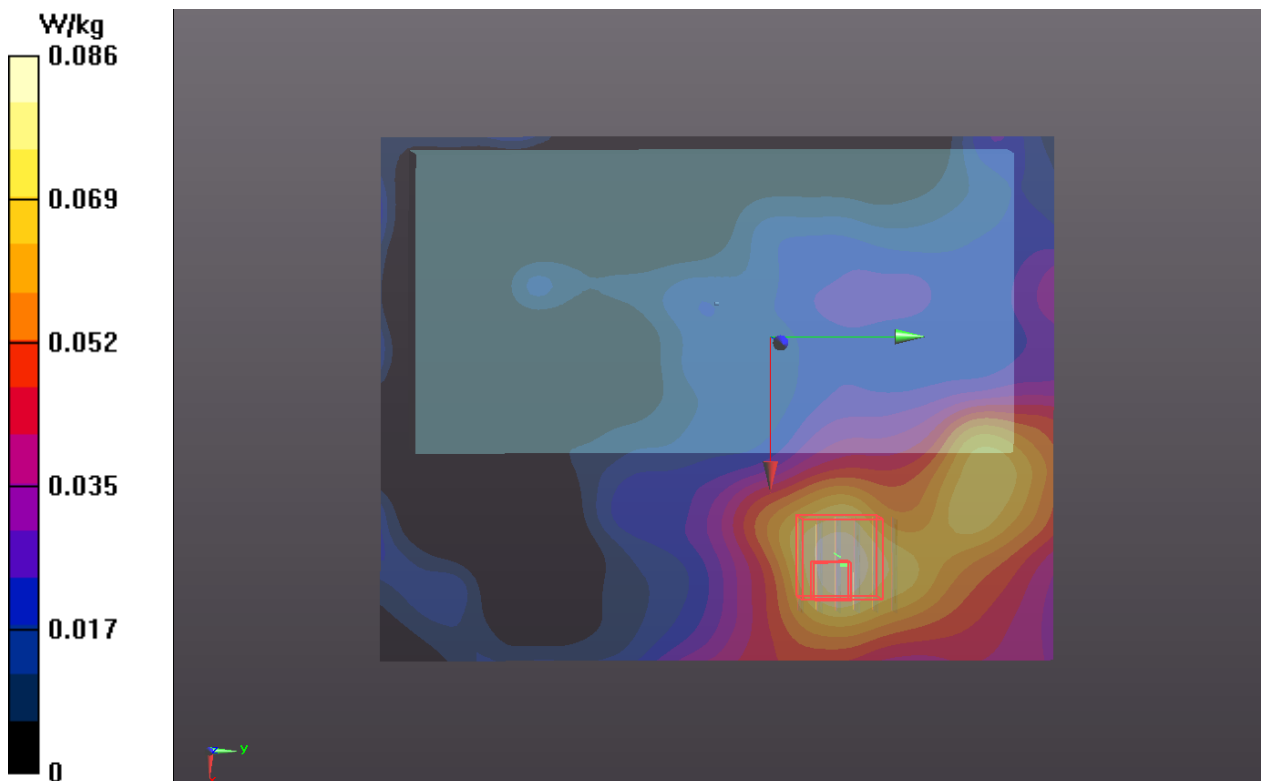
Communication System: WLAN_5G; Frequency: 5680 MHz; Duty Cycle: 1:1.13
Medium: B5G_0319 Medium parameters used: $f = 5680$ MHz; $\sigma = 5.765$ S/m; $\epsilon_r = 47.601$; $\rho = 1000$ kg/m³
Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4, 4, 4); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (141x181x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0863 W/kg

- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 1.981 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.177 W/kg
SAR(1 g) = 0.051 W/kg; SAR(10 g) = 0.025 W/kg
Maximum value of SAR (measured) = 0.0924 W/kg



P15 802.11a_Front Face_0cm_Ch165_EUT+Holster

DUT: 140219C09

Communication System: WLAN_5G; Frequency: 5825 MHz; Duty Cycle: 1:1.13
Medium: B5G_0319 Medium parameters used: $f = 5825$ MHz; $\sigma = 6.059$ S/m; $\epsilon_r = 47.186$; $\rho = 1000$ kg/m³
Ambient Temperature : 21.3 °C; Liquid Temperature : 20.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(4.21, 4.21, 4.21); Calibrated: 2013/04/30;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2013/12/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP:1206
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

- **Area Scan (141x181x1)**: Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0932 W/kg

- **Zoom Scan (6x6x12)/Cube 0**: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 1.623 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.301 W/kg
SAR(1 g) = 0.063 W/kg; SAR(10 g) = 0.027 W/kg
Maximum value of SAR (measured) = 0.106 W/kg

