

FCC SAR Test Report

APPLICANT : Elk LLC
EQUIPMENT : Tablet PC
MODEL NAME : 3HT7G
FCC ID : ZHT-1013
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2003
FCC OET Bulletin 65 Supplement C (Edition 01-01)

The product was completely tested on Sep. 17, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the 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 INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager

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Appendix A. Plots of System Performance Check

Appendix B. Plots of SAR Measurement

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA240709	Rev. 01	Initial issue of report	Sep. 05, 2012
FA240709	Rev. 02	1. Rearrange the section 11.2 standalone SAR summation table, from page 46 – page 49 2. Add simultaneous transmission exclusion description for BT, note 10 in section 11.2. 3. Revise the description of WLAN antenna to PIFA antenna, in section 3.1 4. Revise the description of EUT setting in section 3.4.2	Sep. 12, 2012
FA240709	Rev. 03	1. Include SAR test data of curved-surface contacted with the phantom	Sep. 17, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Elk LLC, Tablet PC, 3HT7G**, are as follows.

Highest 1-g SAR Summary

Band	Position	SAR_{1g} (W/kg)
GSM850	Body (0cm Gap)	1.27
GSM1900	Body (0cm Gap)	1.12
WCDMA Band V	Body (0cm Gap)	1.22
WCDMA Band II	Body (0cm Gap)	1.11
LTE Band 17	Body (0cm Gap)	1.17
LTE Band 4	Body (0cm Gap)	1.21
WLAN 2.4G	Body (0cm Gap)	1.26
WLAN 5G	Body (0cm Gap)	1.32

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 1528-2003 and FCC OET Bulletin 65 Supplement C (Edition 01-01).

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

2.2 Applicant

Company Name	EIK LLC
Address	Suite 100, 2730 Gateway Oaks Drive Sacramento, CA 95833

2.3 Application Details

Date of Start during the Test	Jul. 24, 2012
Date of End during the Test	Sep. 17, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	Tablet PC
Model Name	3HT7G
FCC ID	ZHT-1013
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 4: 1712.5 MHz ~ 1752.5 MHz WLAN2.4G: 2412 MHz ~ 2462 MHz WLAN5G: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz LTE Band 4 : 2112.5 MHz ~ 2152.5 MHz WLAN2.4G: 2412 MHz ~ 2462 MHz WLAN5G: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Maximum Average Output Power to Antenna	GSM850: 31.82 dBm GSM1900: 29.28 dBm WCDMA Band V: 23.05 dBm WCDMA Band II: 23.39 dBm LTE Band 4: 24.43 dBm LTE Band 17: 23.23 dBm 802.11b: 16.88 dBm 802.11g: 16.00 dBm 802.11n-HT20 (2.4GHz): 17.91 dBm 802.11a: 12.65 dBm 802.11n-HT20 (5GHz): 16.37 dBm 802.11n-HT40 (5GHz): 16.08 dBm Bluetooth: 6.88 dBm
Antenna Type	WWAN: Fixed Internal Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna
Type of Modulation	GPRS: GMSK EDGE: GMSK / 8PSK WCDMA (Rel 99): QPSK HSDPA (Rel 6): QPSK HSUPA (Rel 6): QPSK LTE: QPSK / 16QAM 802.11b: DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth: GFSK Bluetooth EDR: $\pi/4$ -DQPSK / 8-DPSK
EUT Stage	Production Unit
Remark: - The above EUT's information was declared by the manufacturer. Please refer to the specifications or user's manual for more detailed description. - Voice call is not supported. 5600 MHz ~ 5650 MHz is notched.	

The table below summarizes necessary items addressed in KDB 941225 D05 v01.

FCC ID				ZHT-1013				
EUT				Tablet PC				
Operating Frequency Range of each LTE transmission band				Band 4: TX: 1712.5 MHz ~ 1752.5 MHz, RX: 2112.5 MHz ~ 2152.5 MHz Band 17: TX: 706.5 MHz ~ 713.5 MHz, RX: 736.5 MHz ~ 743.5 MHz				
Channel Bandwidth				Band 4: 5MHz, 10MHz, 15MHz, 20MHz Band 17: 5MHz, 10MHz				
Transmission (H, M, L) channel numbers and frequencies in each LTE band								
Band 4								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20375	1752.5	20350	1750	20325	1747.5	20300	1745
Band 17								
	Bandwidth 5 MHz			Bandwidth 10 MHz				
	Channel #		Frequency (MHz)		Channel #		Frequency (MHz)	
L	23755		706.5		23780		709	
M	23790		710		23790		710	
H	23825		713.5		23800		711	
UE category, uplink modulations used				Category 3, QPSK, and 16QAM				
LTE transmitter and antenna implementation (standalone or sharing hardware components / antennas)				WWAN Antenna: LTE share the antenna with GPRS/EDGE/UMTS.				
LTE Voice / Data requirements				Data only				
LTE MPR permanently built-in by design				Yes				
LTE A-MPR				Disabled during SAR testing. With CMW500, set NS value to NS_01 to disable A-MPR.				
LTE maximum averaged conducted output power				LTE Band 4: 23.43 dBm LTE Band 17: 23.23 dBm				
Other U.S. wireless operating modes / bands				GPRS/EDGE	GSM850: UL: 824.2 ~ 848.8 MHz / DL: 869.2 ~ 893.8 MHz PCS : UL: 1850.2 ~ 1909.8 MHz / DL: 1930.2 ~ 1989.8 MHz			
				WCDMA HSDPA / HSUPA	Band V: UL: 826.4 ~ 846.6 MHz / DL: 871.4 ~ 891.6 MHz Band II: UL: 1852.4 ~ 1907.6 MHz / DL: 1932.4 ~ 1987.6 MHz			
				WLAN	2.4G: 2412~2462 MHz 5G: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz; 5745 MHz ~ 5825 MHz			
				Bluetooth	2402~2480 MHz			
Simultaneous transmission configurations				In Section 11.2				
Power reduction applied to satisfy SAR compliance				1. Yes, proximity sensor/power reduction is implemented for WWAN SAR compliance. 2. This device does not employ any type of power reduction (through sensing or determined by operation mode or orientation) to meet WLAN SAR requirement. 3. All WLAN SAR tests were performed with the device operating at maximum power.				

3.2 Applied 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 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v04
- FCC KDB 616217 D03 v01
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D03 v01
- FCC KDB 941225 D05 v01
- FCC KDB 248227 D01 v01r02

3.3 Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied to this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

3.4 Test Conditions

3.4.1 Ambient Condition

Ambient Temperature	20 to 24 °C
Humidity	< 60 %

3.4.2 Test Configuration

For WWAN SAR testing, the device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT.

The EUT was set from the emulator to radiate maximum WWAN output power during all tests; for Bottom-Face and Edge1 testing at 0cm separation, the proximity sensor will activate the power reduction and the maximum power is limited at the pre-defined level implemented in this device.

The power reduction scheme compliance is also verified at the proximity sensor trigger distance, and during this testing the proximity sensor was disable and EUT will transmit at the maximum power requested by the base station simulator.

For WLAN SAR testing, WLAN engineering testing software installed on the EUT can provide the continuous transmitting RF signal. The following table shows the duty cycle of each mode:

WiFi 2.4G	Mode	Duty Cycle	Duty Cycle Compensate Factor
802.11b	Legacy	100.00%	1.00
802.11g	Legacy	99.15%	1.01
802.11n-HT20	SISO	99.01%	1.01
802.11n-HT20	MIMO	98.20%	1.02
WiFi 5G	Mode	Duty Cycle	Duty Cycle Compensate Factor
802.11a (5180 MHz ~ 5700 MHz)	Legacy	99.17%	1.01
802.11a (5745 MHz ~ 5825 MHz)	Legacy	99.36%	1.01
802.11n-HT20 (5180 MHz ~ 5700 MHz)	SISO	99.08%	1.01
802.11n-HT20 (5745 MHz ~ 5825 MHz)	SISO	99.08%	1.01
802.11n-HT40 (5180 MHz ~ 5700 MHz)	SISO	98.60%	1.01
802.11n-HT40 (5745 MHz ~ 5825 MHz)	SISO	98.60%	1.01
802.11n-HT20 (5180 MHz ~ 5700 MHz)	MIMO	98.21%	1.02
802.11n-HT20 (5745 MHz ~ 5825 MHz)	MIMO	98.21%	1.02
802.11n-HT40 (5180 MHz ~ 5700 MHz)	MIMO	96.70%	1.03
802.11n-HT40 (5745 MHz ~ 5825 MHz)	MIMO	97.00%	1.03

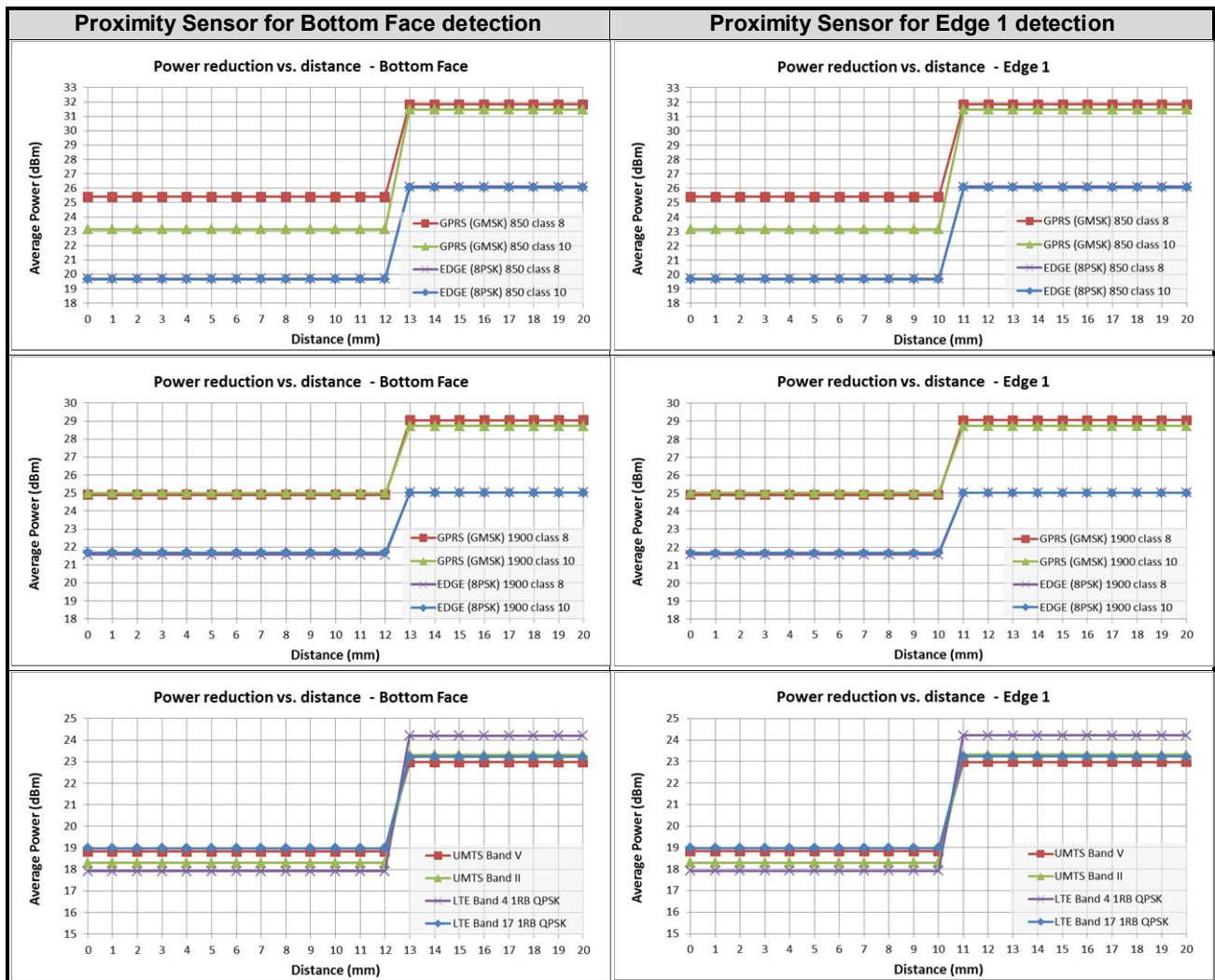
The EUT implements the power reduction scheme for SAR compliance, for specific device configuration and orientations, as described below. The complete description of the implementation and functionality is provided in the "Operational Description of power reduction" exhibit.

Power reduction applied for each wireless mode and orientation

Exposure Position / wireless mode	GPRS/EDGE 850	GPRS/EDGE 1900	UMTS Band 5	UMTS Band 2	LTE Band 4	LTE Band 17
Bottom Face	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Yes	Yes	Yes	Yes	Yes	Yes
Edge 2	N/A	N/A	N/A	N/A	N/A	N/A
Edge 3	N/A	N/A	N/A	N/A	N/A	N/A
Edge 4	N/A	N/A	N/A	N/A	N/A	N/A

Remark:

1. Yes: Reduced maximum limit applied by activation of the proximity sensor.
2. N/A: Normal output power without reduction
3. Power reduction is not applicable for WiFi and Bluetooth.



Remark:

1. GPRS (GMSK) 850 class 8, CH189. Full power: 31.82dBm, Reduced power: 25.40dBm. The power reduction level is 6.42dB.
2. GPRS (GMSK) 850 class 10, CH189. Full power: 31.48dBm, Reduced power: 23.15dBm. The power reduction level is 8.33dB.
3. EDGE (8PSK) 850 class 8, CH189. Full power: 26.10dBm, Reduced power: 19.71dBm. The power reduction level is 6.39dB.
4. EDGE (8PSK) 850 class 10, CH189. Full power: 26.05dBm, Reduced power: 19.65dBm. The power reduction level is 6.40dB.
5. GPRS (GMSK) 1900 class 8, CH661. Full power: 29.05dBm, Reduced power: 24.90dBm. The power reduction level is 4.15dB.
6. GPRS (GMSK) 1900 class 10, CH661. Full power: 28.73dBm, Reduced power: 25.00dBm. The power reduction level is 3.73dB.
7. EDGE (8PSK) 1900 class 8, CH661. Full power: 25.03dBm, Reduced power: 21.57dBm. The power reduction level is 3.46dB.
8. EDGE (8PSK) 1900 class 10, CH661. Full power: 25.01dBm, Reduced power: 21.68dBm. The power reduction level is 3.33dB.
9. WCDMA Band V, RMC12.2k, CH4182, Full power: 22.98dBm, Reduced power: 18.83dBm. The power reduction level is 4.15dB.
10. WCDMA Band II, RMC12.2k, CH9400 Full power: 23.32dBm, Reduced power: 18.30dBm. The power reduction level is 5.02dB.
11. LTE Band 4, BW 20MHz, QPSK, 1RB size at the lower edge of CH20175, Full power: 24.21dBm, Reduced power: 17.92dBm. The power reduction level is 6.29dB.
12. LTE Band 17, BW 10MHz, QPSK, 1RB size at the higher edge of CH23790, Full power: 23.23dBm, Reduced power: 18.98dBm. The power reduction level is 4.25dB.

This device has curved-edge industrial design of the outer housing, the 4 edges between Bottom-Face and Front-Face (Display surface) employ curvature transition; the detailed antenna location and proximity sensor pad location around the curvature surface is illustrated in operational description exhibit.

RF exposure at the curved-surface was taken into consideration. For SAR testing at the curved surface of Edge1 and Edge4 directly contacted with phantom, pre-test at different EUT tilt angles were performed and the worst case was chosen for SAR testing. SAR test data submitted represents the most conservative RF exposure level

In this SAR test setup, the proximity sensor will be triggered and EUT is in WWAN power reduction mode.

4. Specific Absorption Rate (SAR)

4.1 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.

4.2 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:

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

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

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

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

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

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

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

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

5. SAR Measurement System

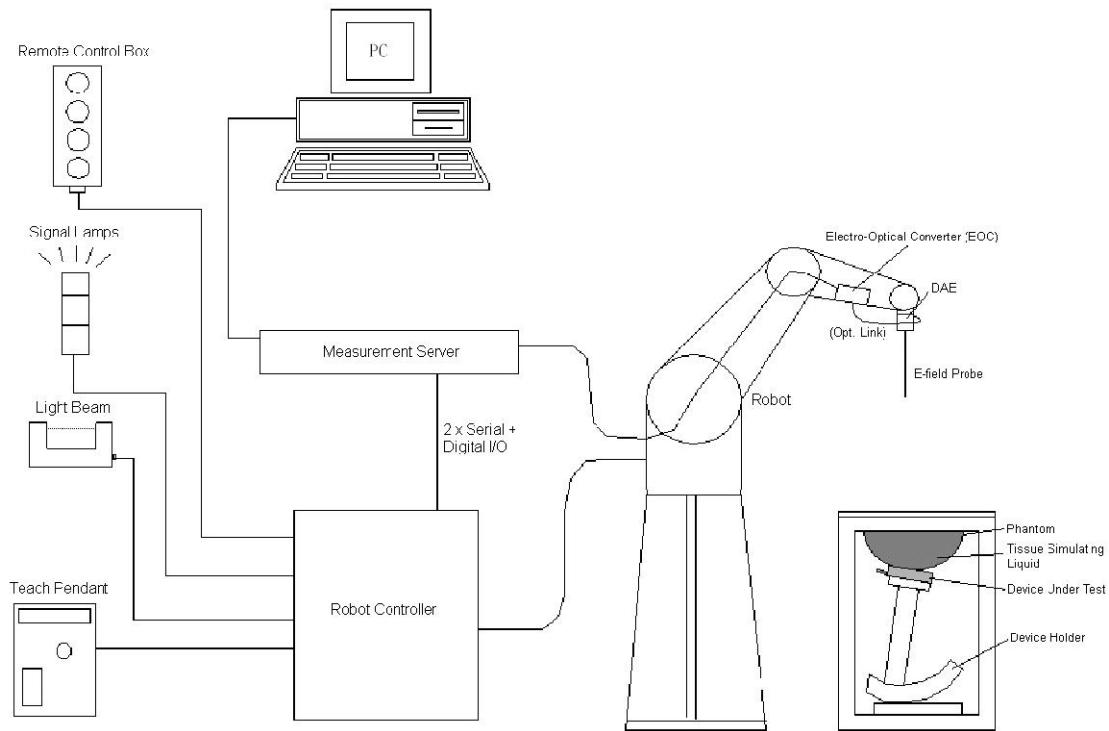


Fig 5.1 SPEAG DASY System Configurations

The DASY system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (EOC) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Some of the components are described in details in the following sub-sections.

5.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequencies. This probe has a built in optical surface detection system to prevent from collision with phantom.

5.1.1 E-Field Probe Specification

<ET3DV6 / ET3DV6R Probe >

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	 Fig 5.2 Photo of ET3DV6/ET3DV6R
Frequency	10 MHz to 3 GHz; Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g to 100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 330 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm	

<EX3DV4 / ES3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	 Fig 5.3 Photo of EX3DV4/ES3DV4
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: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. The calibration data can be referred to Appendix C of this report.

5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



Fig 5.4 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90BL; DASY5: TX90XL) type 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)

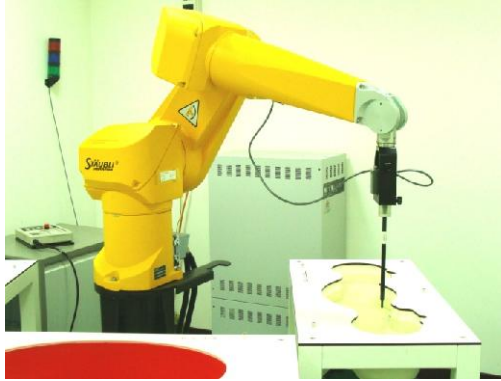


Fig 5.5 Photo of DASY4



Fig 5.6 Photo of DASY5

5.4 Measurement Server

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

The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.



Fig 5.7 Photo of Server for DASY4



Fig 5.8 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

Fig 5.9 Photo of SAM Phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI4 Phantom>

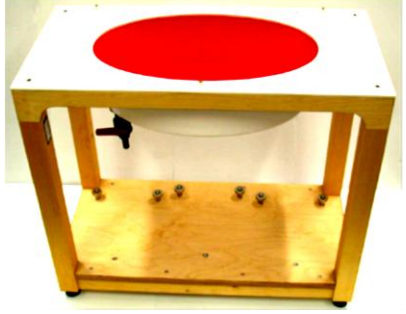
Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

Fig 5.10 Photo of ELI4 Phantom

The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

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

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

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



Fig 5.11 Device Holder

<Laptop Extension Kit>

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

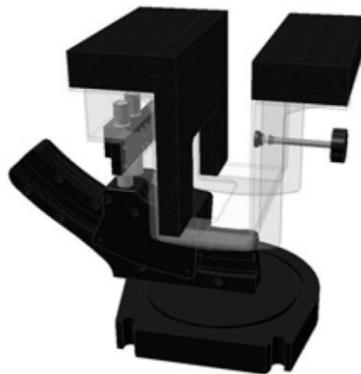


Fig 5.12 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files. The post-processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type (e.g., [V/m], [A/m], [mW/g]). Some of these units are not available in certain situations or give meaningless results, e.g., a SAR-output in a non-lose media, will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.7.2 Data Evaluation

The DASY post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software :

Probe parameters :	- Sensitivity	Norm _i , a _{i0} , a _{i1} , a _{i2}
	- Conversion factor	ConvF _i
	- Diode compression point	dcp _i
Device parameters :	- Frequency	f
	- Crest factor	cf
Media parameters :	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.

The formula for each channel can be given as :

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with V_i = compensated signal of channel i, (i = x, y, z)
 U_i = input signal of channel i, (i = x, y, z)
 cf = crest factor of exciting field (DASY parameter)
 dcp_i = diode compression point (DASY parameter)

From the compensated input signals, the primary field data for each channel can be evaluated :

$$\text{E-field Probes : } E_i = \sqrt{\frac{V_i}{\text{Norm}_i \cdot \text{ConvF}}}$$

$$\text{H-field Probes : } H_i = \sqrt{V_i \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}}$$

with V_i = compensated signal of channel i, (i = x, y, z)
 Norm_i = sensor sensitivity of channel i, (i = x, y, z), $\mu\text{V}/(\text{V/m})^2$ for E-field Probes
 ConvF = sensitivity enhancement in solution
 a_{ij} = sensor sensitivity factors for H-field probes
 f = carrier frequency [GHz]
 E_i = electric field strength of channel i in V/m
 H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude) :

$$E_{\text{tot}} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$\text{SAR} = E_{\text{tot}}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in mW/g
 E_{tot} = total field strength in V/m
 σ = conductivity in [mho/m] or [Siemens/m]
 ρ = equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	Jun. 11, 2010	Jun. 10, 2013
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 22, 2010	Mar. 21, 2013
SPEAG	1750MHz System Validation Kit	D1750V2	1023	Jun. 20, 2012	Jun. 19, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 23, 2010	Mar. 22, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Jan. 18, 2012	Jan. 17, 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Nov. 22, 2011	Nov. 21, 2012
SPEAG	Data Acquisition Electronics	DAE3	495	Apr. 23, 2012	Apr. 22, 2013
SPEAG	Data Acquisition Electronics	DAE4	1279	May 03, 2012	May 02, 2013
SPEAG	Data Acquisition Electronics	DAE4	1338	Jun. 12, 2012	Jun. 11, 2013
SPEAG	Dosimetric E-Field Probe	ET3DV6	1787	May 29, 2012	May 28, 2013
SPEAG	Dosimetric E-Field Probe	ET3DV6R	1788	Jan. 26, 2012	Jan. 25, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3792	Jun. 21, 2012	Jun. 20, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Nov. 16, 2011	Nov. 15, 2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3578	Jun. 21, 2012	Jun. 20, 2013
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1303	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1383	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1446	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1478	NCR	NCR
SPEAG	SAM Phantom	QD 000 P41 C	TP-1150	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1644	NCR	NCR
SPEAG	SAM Phantom	SM 000 T01 DA	TP-1542	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BB	1026	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BA	1029	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 002 AA	TP-1127	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 002 AA	TP-1131	NCR	NCR
Agilent	Network Analyzer	E5071C	MY46101588	May 11, 2012	May 10, 2013
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 17, 2011	Oct. 16, 2012
Anritsu	Power Meter	ML2495A	0932001	Sep. 21, 2011	Sep. 20, 2012
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Dec. 21, 2011	Dec. 20, 2012
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
Agilent	Wireless Communication Test Set	E5515C	GB46311322	Mar. 23, 2011	Mar. 22, 2013
Agilent	Wireless Communication Test Set	E5515C	MY50264370	Apr. 19, 2011	Apr. 18, 2013
Agilent	Wireless Communication Test Set	E5515C	MY50266977	Nov. 13, 2011	Nov. 12, 2013
R&S	Universal Digital Radiocommunication Tester	CMU200	117997	Aug. 22, 2011	Aug. 21, 2012
R&S	Universal Digital Radiocommunication Tester	CMU200	106656	Jun. 28, 2012	Jun. 27, 2013
R&S	Spectrum Analyzer	FSP7	101131	Jul. 23, 2012	Jul. 22, 2013

Table 5.1 Test Equipment List

Note:

1. The calibration certificate of DASY can be referred to Appendix C of this report.
2. Referring to KDB 450824 D02, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D750V3, SN: 1012, D835V2, SN: 499, D1900V2, SN: 5d041, and D2450V2, SN: 736, can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. 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, which is shown in Fig. 6.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.2.

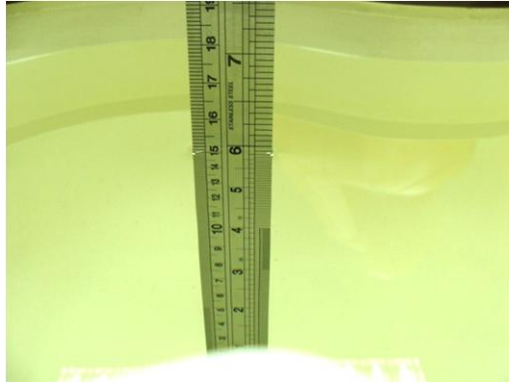


Fig 6.1 Photo of Liquid Height for Head SAR



Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	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
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
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

Table 6.1 Recipes of Tissue Simulating Liquid

Simulating Liquid for 5G, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

The following table shows the measurement results for simulating liquid.

Freq. (MHz)	Liquid Type	Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	Body	21.4	0.962	53.914	0.96	55.5	0.21	-2.86	±5	Jul. 24, 2012
750	Body	21.5	0.963	54.2	0.96	55.5	0.31	-2.34	±5	Aug. 16, 2012
835	Body	21.3	0.983	54.388	0.97	55.2	1.34	-1.47	±5	Jul. 24, 2012
835	Body	21.5	0.996	55.4	0.97	55.2	2.68	0.36	±5	Aug. 15, 2012
835	Body	21.5	0.994	54.7	0.97	55.2	2.47	-0.91	±5	Aug. 21, 2012
1750	Body	21.5	1.55	51.7	1.52	53.3	1.97	-3.00	±5	Jul. 26, 2012
1750	Body	21.5	1.51	51.3	1.52	53.3	-0.66	-3.75	±5	Aug. 16, 2012
1750	Body	21.5	1.51	52.2	1.52	53.3	-0.66	-2.06	±5	Aug. 21, 2012
1900	Body	21.4	1.516	53.631	1.52	53.3	-0.26	0.62	±5	Jul. 25, 2012
1900	Body	21.5	1.55	51.9	1.52	53.3	1.97	-2.63	±5	Aug. 16, 2012
1900	Body	21.5	1.52	54.6	1.52	53.3	0.00	2.44	±5	Aug. 20, 2012
2450	Body	21.5	1.96	53.8	1.95	52.7	0.51	2.09	±5	Jul. 25, 2012
2450	Body	21.5	1.973	52.342	1.95	52.7	1.18	-0.68	±5	Jul. 26, 2012
2450	Body	21.5	1.96	53.8	1.95	52.7	0.51	2.09	±5	Sep. 13, 2012
2450	Body	21.5	1.969	52.278	1.95	52.7	0.97	-0.8	±5	Sep. 15, 2012
5200	Body	21.5	5.373	48.526	5.30	49.0	1.38	-0.97	±5	Jul. 24, 2012
5200	Body	21.6	5.297	49.185	5.3	49	-0.06	0.38	±5	Jul. 25, 2012
5200	Body	21.5	5.3	49.2	5.30	49.0	0.00	0.41	±5	Sep. 13, 2012
5200	Body	21.5	5.162	48.492	5.30	49.0	-2.60	-1.04	±5	Sep. 14, 2012
5200	Body	21.5	5.297	49.185	5.30	49.0	-0.06	0.38	±5	Sep. 17, 2012
5200	Body	21.5	5.28	48.5	5.30	49.0	-0.38	-1.02	±5	Sep. 17, 2012
5500	Body	21.5	5.806	47.837	5.65	48.6	2.76	-1.57	±5	Jul. 24, 2012
5500	Body	21.6	5.738	48.597	5.65	48.6	1.56	-0.01	±5	Jul. 25, 2012
5500	Body	21.5	5.74	48.6	5.65	48.6	1.59	0.00	±5	Sep. 13, 2012
5500	Body	21.5	5.587	47.93	5.65	48.6	-1.12	-1.38	±5	Sep. 14, 2012
5800	Body	21.5	6.219	47.128	6.00	48.2	3.65	-2.22	±5	Jul. 24, 2012
5800	Body	21.6	6.127	47.784	6	48.2	2.12	-0.86	±5	Jul. 25, 2012
5800	Body	21.5	6.13	47.8	6.00	48.2	2.17	-0.83	±5	Sep. 13, 2012
5800	Body	21.5	5.976	47.158	6.00	48.2	-0.40	-2.16	±5	Sep. 15, 2012
5800	Body	21.5	6.11	47.2	6.00	48.2	1.83	-2.07	±5	Sep. 17, 2012

Table 6.2 Measuring Results for Simulating Liquid

7. SAR Measurement Evaluation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

7.1 Purpose of System Performance check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

7.2 System Setup

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

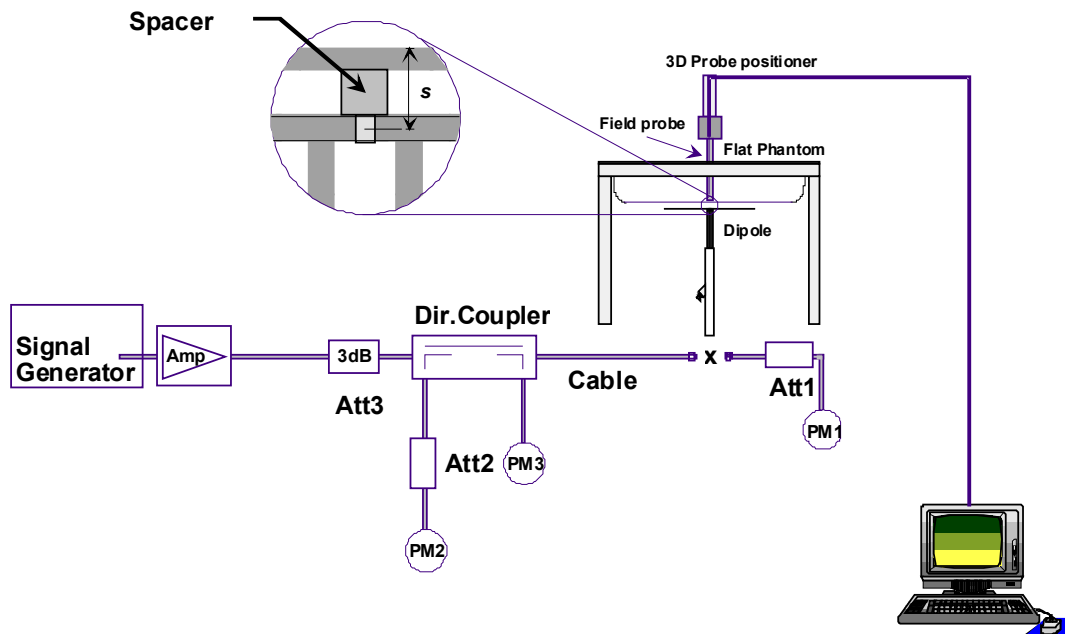


Fig 7.1 System Setup for System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

The output power on dipole port must be calibrated to 24 dBm (250 mW) before dipole is connected.

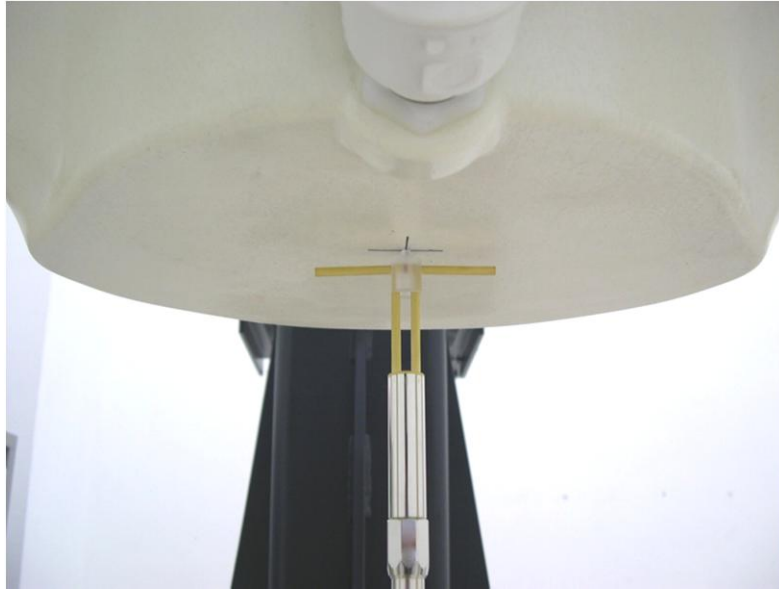


Fig 7.2 Photo of Dipole Setup

7.3 Validation Results

Comparing to the original SAR value provided by SPEAG, the validation data should be within its specification of 10 %. Table 7.1 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.

Measurement Date	Frequency (MHz)	Liquid Type	Targeted SAR _{1g} (W/kg)	Measured SAR _{1g} (W/kg)	Normalized SAR _{1g} (W/kg)	Deviation (%)
Jul. 24, 2012	750	Body	8.86	2.14	8.56	-3.39
Aug. 16, 2012	750	Body	8.86	2.28	9.12	2.93
Jul. 24, 2012	835	Body	9.82	2.51	10.04	2.24
Aug. 15, 2012	835	Body	9.82	2.55	10.20	3.87
Aug. 21, 2012	835	Body	9.82	2.5	10.00	1.83
Jul. 26, 2012	1750	Body	37	9.83	39.32	6.27
Aug. 16, 2012	1750	Body	37	8.58	34.32	-7.24
Aug. 21, 2012	1750	Body	37	9.12	36.48	-1.41
Jul. 25, 2012	1900	Body	40	9.32	37.28	-6.80
Aug. 16, 2012	1900	Body	40	9.46	37.84	-5.40
Aug. 20, 2012	1900	Body	40	10.1	40.40	1.00
Jul. 25, 2012	2450	Body	52.3	12.6	50.40	-3.63
Jul. 26, 2012	2450	Body	52.3	13.1	52.40	0.19
Sep. 13, 2012	2450	Body	52.3	13	52.00	-0.57
Sep. 15, 2012	2450	Body	52.3	13	52.00	-0.57
Jul. 24, 2012	5200	Body	72.6	18.3	73.20	0.83
Jul. 25, 2012	5200	Body	72.6	18	72.00	-0.83
Sep. 13, 2012	5200	Body	72.60	18.6	74.40	2.48
Sep. 14, 2012	5200	Body	72.60	19	76.00	4.68
Sep. 17, 2012	5200	Body	72.60	18.6	74.40	2.48
Sep. 17, 2012	5200	Body	72.60	16.7	66.80	-7.99
Jul. 24, 2012	5500	Body	78.8	20.1	80.40	2.03
Jul. 25, 2012	5500	Body	78.8	19.9	79.60	1.02
Sep. 13, 2012	5500	Body	78.80	19.9	79.60	1.02
Sep. 14, 2012	5500	Body	78.80	19.4	77.60	-1.52
Jul. 24, 2012	5800	Body	73.1	19.2	76.80	5.06
Jul. 25, 2012	5800	Body	73.1	18.9	75.60	3.42
Sep. 13, 2012	5800	Body	73.10	19.6	78.40	7.25
Sep. 15, 2012	5800	Body	73.10	18.5	74.00	1.23
Sep. 17, 2012	5800	Body	73.1	16.9	67.60	-7.52

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

Refer to "SAR Test Photo exhibit for detailed test setup information.

9. Measurement Procedures

The measurement procedures are as follows:

- (a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
- (b) Keep EUT to radiate maximum output power or 100% duty factor (if applicable)
- (c) Measure output power through RF cable and power meter.
- (d) Place the EUT in the positions as Appendix E demonstrates.
- (e) Set scan area, grid size and other setting on the DASY software.
- (f) Measure SAR results for the highest power channel on each testing position.
- (g) Find out the largest SAR result on these testing positions of each band
- (h) Measure SAR results for other channels in worst SAR testing position if the 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 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

9.2 Area & Zoom Scan Procedures

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 measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

9.3 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 (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.4 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.

9.5 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. SAR Test Configurations

10.1 Exposure Positions Consideration

Sides for SAR tests; Tablet mode									
Technology	Transmitting Antenna	Front Face	Bottom Face	Edge 1	Edge 2	Edge 3	Edge 4	Curved surface of Edge 1 / Bottom-Face	Curved surface of Edge 4 / Bottom-Face
GPRS/EDGE	WWAN Main	No	Yes (0, 11mm)	Yes (0, 9mm)	Yes (0 mm)	No	No	Tilted	No
UMTS									
LTE									
2.4GHz 802.11 b/g/n (SISO)	WLAN Ant. 1	No	Yes (0 mm)	Yes (0 mm)	No	No	Yes (0 mm)	Tilted	No
5GHz 802.11 a/n (SISO)									
2.4GHz 802.11 n (MIMO)	WLAN Ant. 1+2	No	Yes (0 mm)	Yes (0 mm)	No	No	Yes (0 mm)	Tilted	Tilted
5GHz 802.11 n (MIMO)									

Note:

1. Per KDB 941225 D07, the EUT diagonal > 20 cm and Mini-Tablet procedure is not applied. Therefore, SAR tests follow the Tablet Mode in KDB 447498.
2. There is no screen orientation limitation in EUT; that is 4 orientations are supported. The power reduction for SAR compliance is not triggered by the screen orientation, but triggered by the proximity sensor.
3. As in (1), the test distance is 0 mm to the flat phantom; SAR evaluation is required for Bottom Face and each applicable Edge with the antenna within 5 cm to the user.
4. The proximity sensor is designed to be triggered for Bottom Face and Edge 1 exposure positions. During SAR tests for EUT other edges, the sensor was disabled via a test software tool which is for the purpose of performing SAR and EMC test only and will not be available to the end user.
5. The test distance 11 mm at Bottom Face and 9 mm at Edge 1 are for verifying the conservative condition, whichever EUT proximity sensor maximum activated distance are 12 mm and 10 mm respectively. The EUT is set in full-power mode at 11 mm test distance to the phantom for Bottom Face and 9 mm test distance to the phantom for Edge 1.
6. EUT does not support voice call function; therefore GSM SAR is not required.
7. Per KDB 447498 D01, the distance from the WWAN Main antenna to the Edge 3 / Edge 4 > 5 cm, therefore the stand-alone SAR in these configurations is not required.
8. Per KDB 447498 D01, the distance from WLAN antenna 1 and WLAN antenna 2 to the Edge 2 / Edge 3 > 5 cm, therefore the stand-alone in these configurations SAR are not required.
9. WLAN Antenna 2 only transmits during 802.11n MIMO mode, it cannot transmit in SISO mode. 802.11n SISO mode transmits via WLAN Ant. 1 only.
10. For SAR testing at the curved surface of Edge1 and Edge4 directly contacted with phantom, pre-test at different EUT tilt angles were performed and the worst case was chosen for SAR testing. SAR test data submitted represents the most conservative RF exposure level

10.2 Conducted RF Output Power (Unit: dBm)

<GSM850>

Burst Average Power									
Band	GSM850								
Channel	128	189	251	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	824.2	836.4	848.8
Mode	Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
GPRS 8 (1 Uplink) CS1	31.71	31.82	31.80	25.32	25.40	25.35	6.39	6.42	6.45
GPRS 10 (2 Uplink) CS1	31.37	31.48	31.47	23.03	23.15	22.99	8.34	8.33	8.48
EDGE 8 (GMSK, 1 Uplink) MCS1	31.70	31.81	31.78	25.28	25.37	25.32	6.42	6.44	6.46
EDGE 10 (GMSK, 2 Uplink) MCS1	31.35	31.46	31.46	22.95	23.09	22.94	8.40	8.37	8.52
EDGE 8 (8PSK, 1 Uplink) MCS9	26.05	26.10	26.07	19.60	19.71	19.67	6.45	6.39	6.40
EDGE 10 (8PSK, 2 Uplink) MCS9	25.95	26.05	26.03	19.52	19.65	19.58	6.43	6.40	6.45
Source-Based Time-Averaged Power									
Band	GSM850								
Channel	128	189	251	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	824.2	836.4	848.8
Mode	Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
GPRS 8 (1 Uplink) CS1	22.71	22.82	22.80	16.32	16.40	16.35	6.39	6.42	6.45
GPRS 10 (2 Uplink) CS1	25.37	25.48	25.47	17.03	17.15	16.99	8.34	8.33	8.48
EDGE 8 (GMSK, 1 Uplink) MCS1	22.70	22.81	22.78	16.28	16.37	16.32	6.42	6.44	6.46
EDGE 10 (GMSK, 2 Uplink) MCS1	25.35	25.46	25.46	16.95	17.09	16.94	8.40	8.37	8.52
EDGE 8 (8PSK, 1 Uplink) MCS9	17.05	17.10	17.07	10.60	10.71	10.67	6.45	6.39	6.40
EDGE 10 (8PSK, 2 Uplink) MCS9	19.95	20.05	20.03	13.52	13.65	13.58	6.43	6.40	6.45
Remark: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method is shown as below: Source based time averaged power = Maximum burst averaged power (1 Uplink) - 9 dB Source based time averaged power = Maximum burst averaged power (2 Uplink) - 6 dB									

Note:

- Following KDB 941225 D03, for Body SAR testing, the EUT was set in GPRS 10 for GSM850 due to its highest source-based time-average power.
- Per KDB 447498, the maximum output power channel is used for SAR testing and for further SAR test reduction.
- EDGE tests with MCS1 setting, GMSK modulation. Burst average power with MCS9 setting 8 PSK modulations is provided voluntarily for reference.

<GSM1900>

Burst Average Power									
Band	GSM1900								
Channel	512	661	810	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1850.2	1880	1909.8
Mode	Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
GPRS 8 (1 Uplink) CS1	29.21	29.05	29.28	25.13	24.90	25.06	4.08	4.15	4.22
GPRS 10 (2 Uplink) CS1	28.81	28.73	28.88	25.24	25.00	25.25	3.57	3.73	3.63
EDGE 8 (GMSK, 1 Uplink) MCS1	29.19	29.04	29.26	25.23	24.86	25.06	3.96	4.18	4.20
EDGE 10 (GMSK, 2 Uplink) MCS1	28.78	28.71	28.87	25.22	25.01	25.19	3.56	3.70	3.68
EDGE 8 (8PSK, 1 Uplink) MCS9	25.02	25.03	25.08	21.73	21.57	21.75	3.29	3.46	3.33
EDGE 10 (8PSK, 2 Uplink) MCS9	25.05	25.01	25.09	21.85	21.68	21.87	3.20	3.33	3.22
Source-Based Time-Averaged Power									
Band	GSM1900								
Channel	512	661	810	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1850.2	1880	1909.8
Mode	Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
GPRS 8 (1 Uplink) CS1	20.21	20.05	20.28	16.13	15.90	16.06	4.08	4.15	4.22
GPRS 10 (2 Uplink) CS1	22.81	22.73	22.88	19.24	19.00	19.25	3.57	3.73	3.63
EDGE 8 (GMSK, 1 Uplink) MCS1	20.19	20.04	20.26	16.23	15.86	16.06	3.96	4.18	4.20
EDGE 10 (GMSK, 2 Uplink) MCS1	22.78	22.71	22.87	19.22	19.01	19.19	3.56	3.70	3.68
EDGE 8 (8PSK, 1 Uplink) MCS9	16.02	16.03	16.08	12.73	12.57	12.75	3.29	3.46	3.33
EDGE 10 (8PSK, 2 Uplink) MCS9	19.05	19.01	19.09	15.85	15.68	15.87	3.20	3.33	3.22
Remark: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method is shown as below: Source based time averaged power = Maximum burst averaged power (1 Uplink) - 9 dB Source based time averaged power = Maximum burst averaged power (2 Uplink) - 6 dB									

Note:

- Following KDB 941225 D03, for Body SAR testing, the EUT was set in GPRS 10 for GSM1900 due to its highest source-based time-average power.
- Per KDB 447498, the maximum output power channel is used for SAR testing and for further SAR test reduction.
- EDGE tests with MCS1 setting, GMSK modulation. Burst average power with MCS9 setting 8 PSK modulations is provided voluntarily for reference.

<WCDMA Band V>

Band		WCDMA Band V								
Channel		4132	4182	4233	4132	4182	4233	4132	4182	4233
Frequency (MHz)		826.4	836.4	846.6	826.4	836.4	846.6	826.4	836.4	846.6
Mode		Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
3GPP Rel 99	RMC 12.2K	22.99	22.98	23.05	18.85	18.83	18.92	4.14	4.15	4.13
3GPP Rel 6	HSDPA Subtest-1	22.11	22.23	22.21	17.90	18.02	18.08	4.21	4.21	4.13
3GPP Rel 6	HSDPA Subtest-2	22.10	22.22	22.15	17.97	18.09	18.02	4.13	4.13	4.13
3GPP Rel 6	HSDPA Subtest-3	21.62	21.73	21.75	17.49	17.60	17.62	4.13	4.13	4.13
3GPP Rel 6	HSDPA Subtest-4	21.64	21.74	21.69	17.51	17.61	17.56	4.13	4.13	4.13
3GPP Rel 6	HSUPA Subtest-1	21.41	22.10	22.06	17.28	17.92	17.88	4.13	4.18	4.18
3GPP Rel 6	HSUPA Subtest-2	19.15	19.38	19.22	15.05	15.25	15.10	4.1	4.13	4.12
3GPP Rel 6	HSUPA Subtest-3	20.52	20.85	20.88	16.39	16.70	16.73	4.13	4.15	4.15
3GPP Rel 6	HSUPA Subtest-4	20.88	20.90	21.14	16.75	16.77	16.89	4.13	4.13	4.25
3GPP Rel 6	HSUPA Subtest-5	21.22	21.88	21.78	17.09	17.75	17.65	4.13	4.13	4.13

Note:

1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1 V9.1.0 to Rel. 6 HSPA.
2. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA and HSUPA output power is < 1/4 dB higher than RMC, or SAR with RMC 12.2kbps setting is $\leq 1.2\text{W/kg}$, HSDPA and HSUPA SAR evaluation can be excluded.
3. By design, HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps; detailed information is included in Tune-up Procedure exhibit.
4. It is expected by the manufacturer that MPR for some HSDPA/HSUPA subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in the tune-up procedure exhibit.

<WCDMA Band II>

Band		WCDMA Band II								
Channel		9262	9400	9538	9262	9400	9538	9262	9400	9538
Frequency (MHz)		1852.4	1880.0	1907.6	1852.4	1880.0	1907.6	1852.4	1880.0	1907.6
Mode		Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
3GPP Rel 99	RMC 12.2K	23.39	23.32	23.38	18.39	18.30	18.35	5.00	5.02	5.03
3GPP Rel 6	HSDPA Subtest-1	22.54	22.40	22.55	17.65	17.45	17.40	4.89	4.95	5.15
3GPP Rel 6	HSDPA Subtest-2	22.40	22.33	22.34	17.61	17.48	17.45	4.79	4.85	4.89
3GPP Rel 6	HSDPA Subtest-3	22.13	21.89	22.03	17.20	16.91	16.99	4.93	4.98	5.04
3GPP Rel 6	HSDPA Subtest-4	21.90	21.89	21.86	17.19	16.94	17.01	4.71	4.95	4.85
3GPP Rel 6	HSUPA Subtest-1	22.40	21.84	21.82	17.33	16.84	16.84	5.07	5.00	4.98
3GPP Rel 6	HSUPA Subtest-2	19.63	19.70	19.77	14.76	14.76	14.77	4.87	4.94	5.00
3GPP Rel 6	HSUPA Subtest-3	20.63	20.90	20.89	15.65	15.92	15.89	4.98	4.98	5.00
3GPP Rel 6	HSUPA Subtest-4	21.32	21.37	21.41	16.02	16.07	16.09	5.30	5.30	5.32
3GPP Rel 6	HSUPA Subtest-5	22.32	22.38	22.41	17.34	17.42	17.44	4.98	4.96	4.97

Note:

1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1 V9.1.0 to Rel. 6 HSPA.
2. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA and HSUPA output power is < 1/4 dB higher than RMC, or SAR with RMC 12.2kbps setting is $\leq 1.2\text{W/kg}$, HSDPA and HSUPA SAR evaluation can be excluded.
3. By design, HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps; detailed information is included in Tune-up Procedure exhibit.
4. It is expected by the manufacturer that MPR for some HSDPA/HSUPA subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in the tune-up procedure exhibit.

<LTE band 17>

		Without Power Back-off							With Power Back-off						
BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)			Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch	Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
Channel		23780	23790	23800		23780	23790	23800	23780	23790	23800		23780	23790	23800
Frequency (MHz)		709	710	711		709	710	711	709	710	711		709	710	711
10	QPSK 1-0	22.89	22.83	22.79	0	0.33	0.40	0.42	18.83	18.98	18.98	0	0.00	0.00	0.00
10	QPSK 1-49	23.22	23.23	23.21		0.00	0.00	0.00	18.79	18.92	18.92		0.04	0.06	0.06
10	QPSK 25-13	21.72	21.92	21.95	≤ 1	1.50	1.31	1.26	18.73	18.83	18.78	≤ 1	0.10	0.15	0.20
10	QPSK 50-0	21.73	21.75	21.89		1.49	1.48	1.32	18.68	18.80	18.82		0.15	0.18	0.16
10	16QAM 1-0	22.41	21.81	21.71	≤ 1	0.81	1.42	1.50	18.80	18.91	18.93	≤ 1	0.03	0.07	0.05
10	16QAM 1-49	22.14	22.22	21.80		1.08	1.01	1.41	18.75	18.85	18.81		0.08	0.13	0.17
10	16QAM 25-13	20.88	20.89	20.89	≤ 2	2.34	2.34	2.32	18.62	18.86	18.88	≤ 2	0.21	0.12	0.10
10	16QAM 50-0	20.87	20.79	20.89		2.35	2.44	2.32	18.68	18.66	18.83		0.15	0.32	0.15
Channel		23755	23790	23825		23755	23790	23825	23755	23790	23825		23755	23790	23825
Frequency (MHz)		706.5	710	713.5		706.5	710	713.5	706.5	710	713.5		706.5	710	713.5
5	QPSK 1-0	22.80	22.51	22.63	0	0.00	0.30	0.17	18.77	18.92	18.86	0	0.00	0.00	0.00
5	QPSK 1-24	22.62	22.81	22.80		0.18	0.00	0.00	18.75	18.85	18.82		0.02	0.07	0.04
5	QPSK 12-6	21.63	21.50	21.76	≤ 1	1.17	1.31	1.04	18.60	18.80	18.79	≤ 1	0.17	0.12	0.07
5	QPSK 25-0	21.43	21.40	21.52		1.37	1.41	1.28	18.63	18.73	18.81		0.14	0.19	0.05
5	16QAM 1-0	22.03	21.69	21.65	≤ 1	0.77	1.12	1.15	18.71	18.81	18.83	≤ 1	0.06	0.11	0.03
5	16QAM 1-24	21.79	22.04	21.53		1.01	0.77	1.27	18.63	18.76	18.73		0.14	0.16	0.13
5	16QAM 12-6	20.71	20.55	20.74	≤ 2	2.09	2.26	2.06	18.62	18.66	18.68	≤ 2	0.15	0.26	0.18
5	16QAM 25-0	20.46	20.34	20.58		2.34	2.47	2.22	18.63	18.75	18.70		0.14	0.17	0.16

BW [MHz]	Mod / RB (Size - Offset)	Power Reduction by P-Sensor (dB)		
		Low Ch	Middle Ch	High Ch
Channel		23780	23790	23800
Frequency		709 MHz	710 MHz	711 MHz
10	QPSK 1-0	4.06	3.85	3.81
10	QPSK 1-49	4.43	4.31	4.29
10	QPSK 25-13	2.99	3.09	3.17
10	QPSK 50-0	3.05	2.95	3.07
10	16QAM 1-0	3.61	2.90	2.78
10	16QAM 1-49	3.39	3.37	2.99
10	16QAM 25-13	2.26	2.03	2.01
10	16QAM 50-0	2.19	2.13	2.06
Channel		23755	23790	23825
Frequency		706.5 MHz	710 MHz	713.5 MHz
5	QPSK 1-0	4.03	3.59	3.77
5	QPSK 1-24	3.87	3.96	3.98
5	QPSK 12-6	3.03	2.70	2.97
5	QPSK 25-0	2.80	2.67	2.71
5	16QAM 1-0	3.32	2.88	2.82
5	16QAM 1-24	3.16	3.28	2.80
5	16QAM 12-6	2.09	1.89	2.06
5	16QAM 25-0	1.83	1.59	1.88

Note:

- Per KDB 941225, if the output power variation across the band < 0.5dB, test middle channel SAR first and determine further test reduction based on the SAR results
- During proximity sensor activated and power reduction enabled, the LTE output is reduced to a certain level, while MPR for different RB configurations is disabled. The power reduction is based on the normal maximum output power.

<LTE band 4>

		Without Power Back-off							With Power Back-off						
BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)			Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch	Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
Channel		20050	20175	20300		20050	20175	20300	20050	20175	20300		20050	20175	20300
Frequency (MHz)		1720	1732.5	1745		1720	1732.5	1745	1720	1732.5	1745		1720	1732.5	1745
20	QPSK 1-0	24.43	24.21	24.24	0	0.00	0.00	0.00	17.90	17.92	17.56	0	0.00	0.00	0.00
20	QPSK 1-49	24.28	24.04	24.19		0.15	0.17	0.05	17.80	17.85	17.55		0.10	0.07	0.01
20	QPSK 25-13	23.25	23.01	22.90	≤ 1	1.18	1.20	1.34	17.75	17.86	17.40	≤ 1	0.15	0.06	0.16
20	QPSK 50-0	23.27	23.12	22.84		1.16	1.09	1.40	17.63	17.70	17.50		0.27	0.22	0.06
20	16QAM 1-0	23.76	23.04	22.92	≤ 1	0.67	1.17	1.32	17.91	17.88	17.63	≤ 1	-0.01	0.04	-0.07
20	16QAM 1-49	23.42	22.78	22.98		1.01	1.43	1.26	17.60	17.79	17.50		0.30	0.13	0.06
20	16QAM 25-13	22.08	21.82	21.86	≤ 2	2.35	2.39	2.38	17.73	17.80	17.55	≤ 2	0.17	0.12	0.01
20	16QAM 50-0	22.15	22.07	21.82		2.28	2.14	2.42	17.62	17.70	17.62		0.28	0.22	-0.06
Channel		20025	20175	20325		20025	20175	20325	20025	20175	20325		20025	20175	20325
Frequency (MHz)		1717.5	1732.5	1747.5		1717.5	1732.5	1747.5	1717.5	1732.5	1747.5		1717.5	1732.5	1747.5
15	QPSK 1-0	24.19	24.16	24.06	0	0.00	0.00	0.00	17.80	17.80	17.63	0	0.00	0.00	0.00
15	QPSK 1-24	24.06	24.09	24.03		0.13	0.07	0.03	17.75	17.70	17.55		0.05	0.10	0.08
15	QPSK 12-6	23.20	23.06	22.86	≤ 1	0.99	1.10	1.20	17.67	17.62	17.60	≤ 1	0.13	0.18	0.03
15	QPSK 25-0	23.16	23.12	22.79		1.03	1.04	1.27	17.55	17.60	17.49		0.25	0.20	0.14
15	16QAM 1-0	23.76	23.01	22.80	≤ 1	0.43	1.15	1.26	17.88	17.82	17.78	≤ 1	-0.08	-0.02	-0.15
15	16QAM 1-24	23.65	22.92	22.76		0.54	1.24	1.30	17.77	17.70	17.67		0.03	0.10	-0.04
15	16QAM 12-6	22.32	22.16	21.77	≤ 2	1.87	2.00	2.29	17.68	17.74	17.77	≤ 2	0.12	0.06	-0.14
15	16QAM 25-0	22.08	22.08	21.86		2.11	2.08	2.20	17.62	17.58	17.60		0.18	0.22	0.03
Channel		20000	20175	20350		20000	20175	20350	20000	20175	20350		20000	20175	20350
Frequency (MHz)		1715	1732.5	1750		1715	1732.5	1750	1715	1732.5	1750		1715	1732.5	1750
10	QPSK 1-0	24.09	24.06	23.94	0	0.00	0.00	0.00	17.81	17.80	17.60	0	0.00	0.00	0.00
10	QPSK 1-49	24.06	24.01	23.76		0.03	0.05	0.18	17.67	17.67	17.55		0.14	0.13	0.05
10	QPSK 25-13	23.36	23.12	23.12	≤ 1	0.73	0.94	0.82	17.70	17.59	17.50	≤ 1	0.11	0.21	0.10
10	QPSK 50-0	23.16	23.16	23.06		0.93	0.90	0.88	17.49	17.70	17.52		0.32	0.10	0.08
10	16QAM 1-0	23.86	23.01	22.82	≤ 1	0.23	1.05	1.12	17.89	17.90	17.45	≤ 1	-0.08	-0.10	0.15
10	16QAM 1-49	23.61	22.96	22.76		0.48	1.10	1.18	17.70	17.78	17.43		0.11	0.02	0.17
10	16QAM 25-13	22.36	21.86	21.86	≤ 2	1.73	2.20	2.08	17.66	17.80	17.40	≤ 2	0.15	0.00	0.20
10	16QAM 50-0	22.18	22.01	21.71		1.91	2.05	2.23	17.57	17.67	17.35		0.24	0.13	0.25
Channel		19975	20175	20375		19975	20175	20375	19975	20175	20375		19975	20175	20375
Frequency (MHz)		1712.5	1732.5	1752.5		1712.5	1732.5	1752.5	1712.5	1732.5	1752.5		1712.5	1732.5	1752.5
5	QPSK 1-0	24.36	23.96	23.90	0	0.00	0.00	0.00	17.90	17.50	17.51	0	0.00	0.00	0.00
5	QPSK 1-24	24.28	23.86	23.82		0.08	0.10	0.08	17.70	17.10	17.35		0.20	0.40	0.16
5	QPSK 12-6	23.89	23.00	22.92	≤ 1	0.47	0.96	0.98	17.80	17.49	17.43	≤ 1	0.10	0.01	0.08
5	QPSK 25-0	23.71	22.96	22.86		0.65	1.00	1.04	17.78	17.39	17.39		0.12	0.11	0.12
5	16QAM 1-0	23.92	22.98	22.89	≤ 1	0.44	0.98	1.01	17.78	17.40	17.50	≤ 1	0.12	0.10	0.01
5	16QAM 1-24	23.88	22.96	22.68		0.48	1.00	1.22	17.74	17.35	17.47		0.16	0.15	0.04
5	16QAM 12-6	22.76	21.82	21.76	≤ 2	1.60	2.14	2.14	17.77	17.39	17.48	≤ 2	0.13	0.11	0.03
5	16QAM 25-0	22.69	21.92	21.86		1.67	2.04	2.04	17.76	17.26	17.49		0.14	0.24	0.02

Note:

- Per KDB 941225, if the output power variation across the band < 0.5dB, test middle channel SAR first and determine further test reduction based on the SAR results.
- During proximity sensor activated and power reduction enabled, the LTE output is reduced to a certain level, while MPR for different RB configurations is disabled. The power reduction is based on the normal maximum output power.

BW [MHz]	Mod / RB (Size - Offset)	Power Reduction by P-Sensor (dB)		
		Low Ch	Mid Ch	High Ch
Channel		20050	20175	20300
Frequency (MHz)		1720	1732.5	1745
20	QPSK 1-0	6.53	6.29	6.68
20	QPSK 1-49	6.48	6.19	6.64
20	QPSK 25-13	5.50	5.15	5.50
20	QPSK 50-0	5.64	5.42	5.34
20	16QAM 1-0	5.85	5.16	5.29
20	16QAM 1-49	5.82	4.99	5.48
20	16QAM 25-13	4.35	4.02	4.31
20	16QAM 50-0	4.53	4.37	4.20
Channel		20025	20175	20325
Frequency (MHz)		1717.5	1732.5	1747.5
15	QPSK 1-0	6.39	6.36	6.43
15	QPSK 1-24	6.31	6.39	6.48
15	QPSK 12-6	5.53	5.44	5.26
15	QPSK 25-0	5.61	5.52	5.30
15	16QAM 1-0	5.88	5.19	5.02
15	16QAM 1-24	5.88	5.22	5.09
15	16QAM 12-6	4.64	4.42	4.00
15	16QAM 25-0	4.46	4.50	4.26
Channel		20000	20175	20350
Frequency (MHz)		1715	1732.5	1750
10	QPSK 1-0	6.28	6.26	6.34
10	QPSK 1-49	6.39	6.34	6.21
10	QPSK 25-13	5.66	5.53	5.62
10	QPSK 50-0	5.67	5.46	5.54
10	16QAM 1-0	5.97	5.11	5.37
10	16QAM 1-49	5.91	5.18	5.33
10	16QAM 25-13	4.70	4.06	4.46
10	16QAM 50-0	4.61	4.34	4.36
Channel		19965	20175	20375
Frequency (MHz)		1712.5	1732.5	1752.5
5	QPSK 1-0	6.46	6.46	6.39
5	QPSK 1-24	6.58	6.76	6.47
5	QPSK 12-6	6.09	5.51	5.49
5	QPSK 25-0	5.93	5.57	5.47
5	16QAM 1-0	6.14	5.58	5.39
5	16QAM 1-24	6.14	5.61	5.21
5	16QAM 12-6	4.99	4.43	4.28
5	16QAM 25-0	4.93	4.66	4.37

<WLAN 2.4G - Without Power Reduction>

WLAN 2.4G 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	16.35	CH 06	16.84	16.87	16.74
CH 06	2437	16.88				
CH 11	2462	16.86				

WLAN 2.4G 802.11g Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)					
		6M		9M	12M	18M	24M	36M	48M
CH 01	2412	11.72	CH 06	15.99	15.97	15.97	15.93	15.93	15.95
CH 06	2437	16.00							
CH 11	2462	13.37							

WLAN 2.4G 802.11n-HT20 Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain	MCS Index	Channel	MCS Index						
			MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	1	10.48	CH 06	14.85	14.84	14.85	14.81	14.85	14.79	14.84
CH 06	2437	1	14.88								
CH 11	2462	1	12.82								

WLAN 2.4G 802.11n-HT20 Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain	MCS Index	Channel	MCS Index						
			MCS8		MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 01	2412	1+2	13.58	CH 06	17.88	17.80	17.85	17.90	17.86	17.90	17.88
CH 06	2437	1+2	17.91								
CH 11	2462	1+2	14.35								

Note:

1. Choose the 11b lowest data rate, highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227, 11g and 11n-HT20 SISO average output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded.
3. Per KDB 248227, 11n-HT20 MIMO average output power is higher than 1/4 dB higher than 11b mode, SAR will be verified.
4. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

<Bluetooth - Without Power Reduction>

Band	Bluetooth		
Channel	0	39	78
Frequency (MHz)	2402	2441	2480
Average Power (dBm)	6.27	6.40	6.88

Note: Per KDB 447498, Bluetooth SAR is excluded due to the highest output power $\leq 60/f$ (GHz) mW, where $60/f$ (GHz) = 24mW = 13.8dBm.

<WLAN 5G - Without Power Reduction>

WLAN 5G 802.11a Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 36	5180	11.82	CH 44	12.61	12.57	12.60	12.48	12.45	12.26	12.37
CH 40	5200	12.33								
CH 44	5220	12.65								
CH 48	5240	11.88								
CH 52	5260	12.15	CH 60	12.61	12.52	12.56	12.54	12.51	12.54	12.43
CH 56	5280	12.23								
CH 60	5300	12.65								
CH 64	5320	12.19								
CH 100	5500	10.70	CH 116	11.16	11.10	11.15	11.12	11.18	11.20	11.19
CH 104	5520	11.08								
CH 108	5540	10.79								
CH 112	5560	10.80								
CH 116	5580	11.44								
CH 132	5660	10.88								
CH 136	5680	10.85								
CH 140	5700	10.74								
CH 149	5745	11.74	CH 157	11.90	11.84	11.87	11.82	11.83	11.86	11.87
CH 153	5765	11.81								
CH 157	5785	11.97								
CH 161	5805	11.93								
CH 165	5825	11.78								

WLAN 5G 802.11n (BW 20M) Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain	MCS Index	Channel	MCS Index						
			MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	1	11.15	CH 44	12.30	12.32	12.28	12.20	12.18	12.12	12.15
CH 40	5200	1	11.99								
CH 44	5220	1	12.31								
CH 48	5240	1	11.61								
CH 52	5260	1	12.05	CH 60	12.57	12.57	12.58	12.59	12.59	12.58	12.58
CH 56	5280	1	11.85								
CH 60	5300	1	12.60								
CH 64	5320	1	12.18								
CH 100	5500	1	10.30	CH 116	10.85	10.85	10.83	10.84	10.89	10.84	10.83
CH 104	5520	1	10.85								
CH 108	5540	1	10.55								
CH 112	5560	1	10.59								
CH 116	5580	1	10.90								
CH 132	5660	1	10.78								
CH 136	5680	1	10.75								
CH 140	5700	1	10.38								
CH 149	5745	1	11.32	CH 157	11.43	11.42	11.43	11.46	11.40	11.45	11.46
CH 153	5765	1	11.41								
CH 157	5785	1	11.48								
CH 161	5805	1	11.22								
CH 165	5825	1	11.19								

Note:

- Choose the 11a lowest data rate, highest output power channel of each band, to test SAR and determine further SAR exclusion.
- Per KDB 248227, 11n-HT20 SISO output power is less than 1/4 dB higher than 11a mode, thus the SAR can be excluded.
- For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

WLAN 5G 802.11n (BW 40M) Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain	MCS Index	Channel	MCS Index						
			MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	1	9.25	CH 46	11.93	11.94	11.96	12.00	11.99	11.98	11.95
CH 46	5230	1	12.03								
CH 54	5270	1	12.15								
CH 62	5310	1	9.71								
CH 102	5510	1	9.89	CH 134	10.74	10.66	10.65	10.59	10.75	10.69	10.73
CH 110	5550	1	10.74								
CH 134	5670	1	10.76								
CH 151	5755	1	11.83								
CH 159	5795	1	11.87	CH 159	11.89	11.92	11.91	11.93	11.90	11.89	11.92

WLAN 5G 802.11n (BW 20M) Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain	MCS Index	Channel	MCS Index						
			MCS8		MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 36	5180	1+2	14.35	CH 44	14.82	14.82	14.72	14.71	14.69	14.70	14.72
CH 40	5200	1+2	14.78								
CH 44	5220	1+2	14.88								
CH 48	5240	1+2	14.76								
CH 52	5260	1+2	16.20	CH 60	16.29	16.28	16.27	16.18	16.17	16.30	16.17
CH 56	5280	1+2	16.23								
CH 60	5300	1+2	16.37								
CH 64	5320	1+2	15.00								
CH 100	5500	1+2	14.13	CH 116	15.06	14.86	14.84	14.81	14.83	14.85	14.84
CH 104	5520	1+2	15.07								
CH 108	5540	1+2	15.08								
CH 112	5560	1+2	15.07								
CH 116	5580	1+2	15.25								
CH 132	5660	1+2	15.13								
CH 136	5680	1+2	15.05								
CH 140	5700	1+2	13.37								
CH 149	5745	1+2	15.12	CH 157	15.64	15.60	15.61	15.63	15.67	15.61	15.63
CH 153	5765	1+2	15.67								
CH 157	5785	1+2	15.68								
CH 161	5805	1+2	15.64								
CH 165	5825	1+2	15.27								

WLAN 5G 802.11n (BW 40M) Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain	MCS Index	Channel	MCS Index						
			MCS8		MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 38	5190	1+2	14.04	CH 46	14.73	14.68	14.73	14.73	14.68	14.67	14.67
CH 46	5230	1+2	14.74								
CH 54	5270	1+2	16.08	CH 54	16.00	15.88	15.88	16.05	16.06	16.07	16.03
CH 62	5310	1+2	12.67								
CH 102	5510	1+2	13.25	CH 110	14.94	14.77	14.96	14.91	14.85	14.86	14.82
CH 110	5550	1+2	15.11								
CH 134	5670	1+2	14.14								
CH 151	5755	1+2	14.87	CH 159	14.91	14.92	14.89	14.90	14.91	14.90	14.90
CH 159	5795	1+2	14.95								

Note:

1. Per KDB 248227, 11n-HT40 SISO output power is less than 1/4 dB higher than 11a mode, thus the SAR can be excluded.
2. MIMO SAR was tested per KDB 248227, and the lowest order modulation, 11n-HT20 MCS8, was chosen to test. 11n-HT40 power is less than 11n-HT20 and 11n-HT40 SAR is excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

11. SAR Test Results

11.1 Test Records for Body SAR Test

<GSM>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Power Back-off (dB)	Power Drift (dB)	SAR _{1g} (W/kg)
28	GSM850	GPRS10	Bottom Face	1.1	189	836.4	31.48	OFF	-0.091	0.99
27	GSM850	GPRS10	Bottom Face	1.1	128	824.2	31.37	OFF	-0.099	0.849
29	GSM850	GPRS10	Bottom Face	1.1	251	848.8	31.47	OFF	-0.028	0.964
31	GSM850	GPRS10	Edge 1	0.9	189	836.4	31.48	OFF	0.0029	0.847
30	GSM850	GPRS10	Edge 1	0.9	128	824.2	31.37	OFF	-0.00806	0.718
32	GSM850	GPRS10	Edge 1	0.9	251	848.8	31.47	OFF	0.103	0.852
33	GSM850	GPRS10	Edge 2	0	189	848.8	31.48	OFF	0.00244	0.251
2	GSM850	GPRS10	Bottom Face	0	189	836.4	23.15	ON	-0.124	0.866
1	GSM850	GPRS10	Bottom Face	0	128	824.2	23.03	ON	-0.128	0.689
3	GSM850	GPRS10	Bottom Face	0	251	848.8	22.99	ON	-0.049	0.953
4	GSM850	GPRS10	Edge 1	0	189	848.8	23.15	ON	0.066	0.667
107	GSM850	GPRS10	Curved surface of Edge 1 / Bottom Face tilted	0	189	836.4	23.15	ON	-0.156	1.16
101	GSM850	GPRS10	Curved surface of Edge 1 / Bottom Face tilted	0	128	824.2	23.03	ON	0.172	1
102	GSM850	GPRS10	Curved surface of Edge 1 / Bottom Face tilted	0	251	848.8	22.99	ON	0.127	1.27
55	GSM1900	GPRS10	Bottom Face	1.1	810	1909.8	28.88	OFF	-0.107	0.436
56	GSM1900	GPRS10	Edge 1	0.9	810	1909.8	28.88	OFF	-0.159	0.397
57	GSM1900	GPRS10	Edge 2	0	810	1909.8	28.88	OFF	-0.0754	0.393
99	GSM1900	GPRS10	Bottom Face	0	810	1909.8	25.25	ON	-0.177	0.845
97	GSM1900	GPRS10	Bottom Face	0	512	1850.2	25.24	ON	-0.12	1.1
98	GSM1900	GPRS10	Bottom Face	0	661	1880	25.00	ON	-0.187	0.921
100	GSM1900	GPRS10	Edge 1	0	810	1909.8	25.25	ON	0.11	0.432
109	GSM1900	GPRS10	Curved surface of Edge 1 / Bottom Face tilted	0	810	1909.8	25.25	ON	0.08	1.05
121	GSM1900	GPRS10	Curved surface of Edge 1 / Bottom Face tilted	0	512	1850.2	25.24	ON	0.066	1.12
108	GSM1900	GPRS10	Curved surface of Edge 1 / Bottom Face tilted	0	661	1880	25.00	ON	-0.183	1.08

Note: Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

<WCDMA>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Power Back-off	Power Drift (dB)	SAR _{1g} (W/kg)
34	WCDMA V	RMC12.2K	Bottom Face	1.1	4233	846.6	23.05	OFF	0.03	0.514
35	WCDMA V	RMC12.2K	Edge 1	0.9	4233	846.6	23.05	OFF	-0.03	0.467
36	WCDMA V	RMC12.2K	Edge 2	0	4233	846.6	23.05	OFF	-0.08	0.105
5	WCDMA V	RMC12.2K	Bottom Face	0	4132	826.4	18.85	ON	-0.142	0.8
6	WCDMA V	RMC12.2K	Bottom Face	0	4182	846.6	18.83	ON	0.123	0.645
7	WCDMA V	RMC12.2K	Bottom Face	0	4233	846.6	18.92	ON	-0.182	0.883
8	WCDMA V	RMC12.2K	Edge 1	0	4132	826.4	18.85	ON	0.136	0.762
9	WCDMA V	RMC12.2K	Edge 1	0	4182	846.6	18.83	ON	0.183	0.749
10	WCDMA V	RMC12.2K	Edge 1	0	4233	846.6	18.92	ON	0.139	0.832
103	WCDMA V	RMC12.2K	Curved surface of Edge 1 / Bottom Face tilted	0	4132	826.4	18.85	ON	0.158	1.21
104	WCDMA V	RMC12.2K	Curved surface of Edge 1 / Bottom Face tilted	0	4182	846.6	18.83	ON	0.108	1.11
105	WCDMA V	RMC12.2K	Curved surface of Edge 1 / Bottom Face tilted	0	4233	846.6	18.92	ON	0.109	1.22
58	WCDMA II	RMC12.2K	Bottom Face	1.1	9262	1852.4	23.39	OFF	0.11	0.499
59	WCDMA II	RMC12.2K	Edge 1	0.9	9262	1852.4	23.39	OFF	-0.02	0.471
60	WCDMA II	RMC12.2K	Edge 2	0	9262	1852.4	23.39	OFF	0.05	0.428
93	WCDMA II	RMC12.2K	Bottom Face	0	9262	1852.4	18.39	ON	0.132	1.11
94	WCDMA II	RMC12.2K	Bottom Face	0	9400	1880	18.30	ON	-0.17	1.02
95	WCDMA II	RMC12.2K	Bottom Face	0	9538	1907.6	18.35	ON	0.172	0.763
96	WCDMA II	RMC12.2K	Edge 1	0	9262	1852.4	18.39	ON	0.11	0.46
122	WCDMA II	RMC12.2K	Curved surface of Edge 1 / Bottom Face tilted	0	9262	1852.4	18.39	ON	-0.05	0.968
110	WCDMA II	RMC12.2K	Curved surface of Edge 1 / Bottom Face tilted	0	9400	1880	18.30	ON	-0.143	0.979
111	WCDMA II	RMC12.2K	Curved surface of Edge 1 / Bottom Face tilted	0	9538	1907.6	18.35	ON	-0.155	0.863

Note: Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

<LTE>

Plot No.	Band	Mode	BW [MHz]	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Power Back-off	Power Drift (dB)	SAR _{1g} (W/kg)
37	LTE Band 17	QPSK(25-13)	10M	Bottom Face	1.1	23790	710.0	21.92	OFF	-0.02	0.45
38	LTE Band 17	QPSK(1-0)	10M	Bottom Face	1.1	23790	710.0	22.83	OFF	0.04	0.494
39	LTE Band 17	QPSK(1-49)	10M	Bottom Face	1.1	23790	710.0	23.23	OFF	-0.03	0.507
46	LTE Band 17	16QAM(25-13)	10M	Bottom Face	1.1	23790	710.0	20.89	OFF	0.04	0.357
47	LTE Band 17	16QAM(1-0)	10M	Bottom Face	1.1	23790	710.0	21.81	OFF	-0.04	0.386
48	LTE Band 17	16QAM(1-49)	10M	Bottom Face	1.1	23790	710.0	22.22	OFF	-0.06	0.398
40	LTE Band 17	QPSK(25-13)	10M	Edge 1	0.9	23790	710.0	21.92	OFF	0.01	0.447
41	LTE Band 17	QPSK(1-0)	10M	Edge 1	0.9	23790	710.0	22.83	OFF	0.02	0.523
42	LTE Band 17	QPSK(1-49)	10M	Edge 1	0.9	23790	710.0	23.23	OFF	0.06	0.571
49	LTE Band 17	16QAM(25-13)	10M	Edge 1	0.9	23790	710.0	20.89	OFF	0.02	0.352
50	LTE Band 17	16QAM(1-0)	10M	Edge 1	0.9	23790	710.0	21.81	OFF	-0.01	0.406
51	LTE Band 17	16QAM(1-49)	10M	Edge 1	0.9	23790	710.0	22.22	OFF	0.01	0.442
43	LTE Band 17	QPSK(25-13)	10M	Edge 2	0	23790	710.0	21.92	OFF	0.02	0.246
44	LTE Band 17	QPSK(1-0)	10M	Edge 2	0	23790	710.0	22.83	OFF	0.04	0.246
45	LTE Band 17	QPSK(1-49)	10M	Edge 2	0	23790	710.0	23.23	OFF	0.09	0.288
52	LTE Band 17	16QAM(25-13)	10M	Edge 2	0	23790	710.0	20.89	OFF	0.03	0.201
53	LTE Band 17	16QAM(1-0)	10M	Edge 2	0	23790	710.0	21.81	OFF	0.02	0.206
54	LTE Band 17	16QAM(1-49)	10M	Edge 2	0	23790	710.0	22.22	OFF	0.06	0.236
11	LTE Band 17	QPSK(25-13)	10M	Bottom Face	0	23780	709.0	18.73	ON	-0.083	0.744
12	LTE Band 17	QPSK(25-13)	10M	Bottom Face	0	23790	710.0	18.83	ON	0.125	0.826
13	LTE Band 17	QPSK(25-13)	10M	Bottom Face	0	23800	711.0	18.78	ON	0.177	0.85
14	LTE Band 17	QPSK(1-0)	10M	Bottom Face	0	23800	711.0	18.98	ON	-0.16	0.571
15	LTE Band 17	QPSK(1-49)	10M	Bottom Face	0	23800	711.0	18.92	ON	-0.14	0.734
21	LTE Band 17	16QAM(25-13)	10M	Bottom Face	0	23800	711.0	18.88	ON	0.148	0.855
22	LTE Band 17	16QAM(1-0)	10M	Bottom Face	0	23800	711.0	18.93	ON	0.158	0.598
23	LTE Band 17	16QAM(1-49)	10M	Bottom Face	0	23800	711.0	18.81	ON	0.149	0.737
17	LTE Band 17	QPSK(25-13)	10M	Edge 1	0	23790	710.0	18.83	ON	0.024	0.662
19	LTE Band 17	QPSK(1-0)	10M	Edge 1	0	23790	710.0	18.98	ON	0.017	0.555
20	LTE Band 17	QPSK(1-49)	10M	Edge 1	0	23790	710.0	18.92	ON	-0.084	0.646
24	LTE Band 17	16QAM(25-13)	10M	Edge 1	0	23790	710.0	18.86	ON	0.079	0.656
25	LTE Band 17	16QAM(1-0)	10M	Edge 1	0	23790	710.0	18.91	ON	0.112	0.556
26	LTE Band 17	16QAM(1-49)	10M	Edge 1	0	23790	710.0	18.85	ON	0.065	0.652
123	LTE Band 17	QPSK(1-49)	10M	Curved surface of Edge 1 / Bottom Face tilted	0	23800	711.0	18.92	ON	0.135	1
116	LTE Band 17	QPSK(1-49)	10M	Curved surface of Edge 1 / Bottom Face tilted	0	23780	709.0	18.79	ON	-0.0252	1.05
117	LTE Band 17	QPSK(1-49)	10M	Curved surface of Edge 1 / Bottom Face tilted	0	23790	710.0	18.92	ON	0.161	1.02
120	LTE Band 17	16QAM(25-13)	10M	Curved surface of Edge 1 / Bottom Face tilted	0	23800	711.0	18.88	ON	-0.097	1.17
118	LTE Band 17	16QAM(25-13)	10M	Curved surface of Edge 1 / Bottom Face tilted	0	23780	709.0	18.62	ON	-0.095	1.09
119	LTE Band 17	16QAM(25-13)	10M	Curved surface of Edge 1 / Bottom Face tilted	0	23790	710.0	18.86	ON	-0.05	1.15

Note:

- Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- 0.5dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is < 1.45 W/kg, SAR for smaller bandwidth can be excluded. Therefore LTE smaller bandwidth SAR tests are excluded.
- Per KDB 941225 D05, for LTE, if 50%-RB QPSK/16QAM SAR < 1.45 W/kg, 100%-RB SAR can be excluded.
- During proximity sensor activated and power reduction enabled, the LTE output is reduced to a certain level, while MPR for different RB configurations is disabled. Therefore the MPR levels are not applicable.
- If the 50%-RB QPSK SAR ≤ 0.8 W/kg, other channels SAR tests are not necessarily referring to KDB 941225.
- 0.9 cm and 1.1 cm test results are for confirming operation of the power reduction scheme.
- LTE Curved SAR was verified on the worst case that obtain from the routine LTE SAR testing.

<LTE>

Plot No.	Band	Mode	BW [MHz]	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Power Back-off	Power Drift (dB)	SAR _{1g} (W/kg)
61	LTE Band 4	QPSK(50-25)	20M	Bottom Face	1.1	20175	1732.5	23.01	OFF	-0.118	0.517
62	LTE Band 4	QPSK(1-0)	20M	Bottom Face	1.1	20175	1732.5	24.21	OFF	-0.116	0.705
63	LTE Band 4	QPSK(1-99)	20M	Bottom Face	1.1	20175	1732.5	24.04	OFF	-0.16	0.734
70	LTE Band 4	16QAM(50-25)	20M	Bottom Face	1.1	20175	1732.5	21.82	OFF	-0.121	0.403
71	LTE Band 4	16QAM(1-0)	20M	Bottom Face	1.1	20175	1732.5	23.04	OFF	-0.055	0.568
72	LTE Band 4	16QAM(1-99)	20M	Bottom Face	1.1	20175	1732.5	22.78	OFF	0.00531	0.578
64	LTE Band 4	QPSK(50-25)	20M	Edge 1	0.9	20175	1732.5	23.01	OFF	0.084	0.535
65	LTE Band 4	QPSK(1-0)	20M	Edge 1	0.9	20175	1732.5	24.21	OFF	0.111	0.754
66	LTE Band 4	QPSK(1-99)	20M	Edge 1	0.9	20175	1732.5	24.04	OFF	0.122	0.768
73	LTE Band 4	16QAM(50-25)	20M	Edge 1	0.9	20175	1732.5	21.82	OFF	0.095	0.423
74	LTE Band 4	16QAM(1-0)	20M	Edge 1	0.9	20175	1732.5	23.04	OFF	0.124	0.629
75	LTE Band 4	16QAM(1-99)	20M	Edge 1	0.9	20175	1732.5	22.78	OFF	0.16	0.623
67	LTE Band 4	QPSK(50-25)	20M	Edge 2	0	20175	1732.5	23.01	OFF	-0.063	0.351
68	LTE Band 4	QPSK(1-0)	20M	Edge 2	0	20175	1732.5	24.21	OFF	-0.06	0.476
69	LTE Band 4	QPSK(1-99)	20M	Edge 2	0	20175	1732.5	24.04	OFF	-0.064	0.523
76	LTE Band 4	16QAM(50-25)	20M	Edge 2	0	20175	1732.5	21.82	OFF	0.052	0.28
77	LTE Band 4	16QAM(1-0)	20M	Edge 2	0	20175	1732.5	23.04	OFF	-0.126	0.38
78	LTE Band 4	16QAM(1-99)	20M	Edge 2	0	20175	1732.5	22.78	OFF	-0.109	0.419
79	LTE Band 4	QPSK(50-25)	20M	Bottom Face	0	20050	1720.0	17.75	ON	0.011	1.09
80	LTE Band 4	QPSK(50-25)	20M	Bottom Face	0	20175	1732.5	17.86	ON	-0.078	1.02
81	LTE Band 4	QPSK(50-25)	20M	Bottom Face	0	20300	1745.0	17.40	ON	-0.041	1.06
82	LTE Band 4	QPSK(1-0)	20M	Bottom Face	0	20050	1720.0	17.90	ON	0.055	0.992
83	LTE Band 4	QPSK(1-99)	20M	Bottom Face	0	20050	1720.0	17.80	ON	-0.025	1.04
87	LTE Band 4	16QAM(50-25)	20M	Bottom Face	0	20050	1720.0	17.73	ON	-0.134	1.21
88	LTE Band 4	16QAM(1-0)	20M	Bottom Face	0	20050	1720.0	17.91	ON	-0.05	0.968
89	LTE Band 4	16QAM(1-99)	20M	Bottom Face	0	20050	1720.0	17.60	ON	0.141	1.06
84	LTE Band 4	QPSK(50-25)	20M	Edge 1	0	20175	1732.5	17.86	ON	0.024	0.468
85	LTE Band 4	QPSK(1-0)	20M	Edge 1	0	20175	1732.5	17.92	ON	0.003	0.432
86	LTE Band 4	QPSK(1-99)	20M	Edge 1	0	20175	1732.5	17.85	ON	0.092	0.393
90	LTE Band 4	16QAM(50-25)	20M	Edge 1	0	20050	1720.0	17.73	ON	0.083	0.454
91	LTE Band 4	16QAM(1-0)	20M	Edge 1	0	20050	1720.0	17.91	ON	0.019	0.377
92	LTE Band 4	16QAM(1-99)	20M	Edge 1	0	20050	1720.0	17.60	ON	0.016	0.38
124	LTE Band 4	QPSK(1-99)	20M	Curved surface of Edge 1 / Bottom Face tilted	0	20050	1720.0	17.80	ON	-0.137	0.952
112	LTE Band 4	QPSK(1-99)	20M	Curved surface of Edge 1 / Bottom Face tilted	0	20175	1732.5	17.85	ON	0.154	0.952
113	LTE Band 4	QPSK(1-99)	20M	Curved surface of Edge 1 / Bottom Face tilted	0	20300	1745.0	17.55	ON	0.12	1.06
125	LTE Band 4	16QAM(50-25)	20M	Curved surface of Edge 1 / Bottom Face tilted	0	20050	1720.0	17.73	ON	0.02	0.933
114	LTE Band 4	16QAM(50-25)	20M	Curved surface of Edge 1 / Bottom Face tilted	0	20175	1732.5	17.80	ON	-0.132	0.881
115	LTE Band 4	16QAM(50-25)	20M	Curved surface of Edge 1 / Bottom Face tilted	0	20300	1745.0	17.55	ON	0.051	0.765

Note:

1. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- 0.5dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is < 1.45 W/kg, SAR for smaller bandwidth can be excluded. Therefore LTE smaller bandwidth SAR tests are excluded.
2. Per KDB 941225 D05, for LTE, if 50%-RB QPSK/16QAM SAR < 1.45 W/kg, 100%-RB SAR can be excluded.
3. During proximity sensor activated and power reduction enabled, the LTE output is reduced to a certain level, while MPR for different RB configurations is disabled. Therefore the MPR levels are not applicable.
4. If the 50%-RB QPSK SAR ≤ 0.8 W/kg, other channels SAR tests are not necessarily referring to KDB 941225.
5. 0.9 cm and 1.1 cm test results are for confirming operation of the power reduction scheme.
6. LTE Curved SAR was verified on the worst case that obtain from the routine LTE SAR testing.

<WLAN2.4G>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Duty Cycle Compensation Factor	Duty Cycle %	Chain	Power Back-off	Power Drift (dB)	SAR _{1g} (W/kg)	Duty Cycle Compensated SAR _{1g} (W/kg)
231	WLAN2.4G	11b	Bottom Face	0	6	2437	16.88	1.00	100	1	OFF	0.158	1.26	1.26
232	WLAN2.4G	11b	Bottom Face	0	1	2412	16.35	1.00	100	1	OFF	0.12	1.22	1.22
233	WLAN2.4G	11b	Bottom Face	0	11	2462	16.86	1.00	100	1	OFF	0.146	1.17	1.17
234	WLAN2.4G	11b	Edge 1	0	6	2437	16.88	1.00	100	1	OFF	0.123	1.11	1.11
235	WLAN2.4G	11b	Edge 1	0	1	2412	16.35	1.00	100	1	OFF	0.182	0.9	0.90
236	WLAN2.4G	11b	Edge 1	0	11	2462	16.86	1.00	100	1	OFF	-0.161	1.25	1.25
237	WLAN2.4G	11b	Edge 4	0	6	2437	16.88	1.00	100	1	OFF	0.126	0.095	0.10
268	WLAN2.4G	11b	Curved surface of Edge 1 / Bottom Face tilted	0	6	2437	16.88	1.00	100	1	OFF	0.162	1.03	1.03
269	WLAN2.4G	11b	Curved surface of Edge 1 / Bottom Face tilted	0	1	2412	16.35	1.00	100	1	OFF	0.108	1.07	1.07
270	WLAN2.4G	11b	Curved surface of Edge 1 / Bottom Face tilted	0	11	2462	16.86	1.00	100	1	OFF	0.129	1.19	1.19
246	WLAN2.4G	11n(20M)	Bottom Face	0	6	2437	17.91	1.02	98.2	1+2	OFF	0.168	1.15	1.17
267	WLAN2.4G	11n(20M)	Bottom Face	0	1	2412	13.58	1.02	98.2	1+2	OFF	0.111	0.416	0.42
248	WLAN2.4G	11n(20M)	Bottom Face	0	11	2462	14.35	1.02	98.2	1+2	OFF	0.152	0.394	0.40
249	WLAN2.4G	11n(20M)	Edge 1	0	6	2437	17.91	1.02	98.2	1+2	OFF	0.08	0.826	0.84
250	WLAN2.4G	11n(20M)	Edge 1	0	1	2412	13.58	1.02	98.2	1+2	OFF	0.071	0.261	0.27
251	WLAN2.4G	11n(20M)	Edge 1	0	11	2462	14.35	1.02	98.2	1+2	OFF	0.06	0.317	0.32
252	WLAN2.4G	11n(20M)	Edge 4	0	6	2437	17.91	1.02	98.2	1+2	OFF	-0.16	0.64	0.65
305	WLAN2.4G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	6	2437	17.91	1.02	98.2	1+2	OFF	0.044	0.896	0.91
306	WLAN2.4G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	1	2412	13.58	1.02	98.2	1+2	OFF	0.049	0.299	0.30
307	WLAN2.4G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	11	2462	14.35	1.02	98.2	1+2	OFF	0.081	0.386	0.39
302	WLAN2.4G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	6	2437	17.91	1.02	98.2	1+2	OFF	0.099	0.818	0.83
303	WLAN2.4G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	1	2412	13.58	1.02	98.2	1+2	OFF	0.17	0.297	0.30
304	WLAN2.4G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	11	2462	14.35	1.02	98.2	1+2	OFF	0.048	0.337	0.34

Note:

- Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
- For SAR testing at the curved surface of Edge 1 directly contacted with phantom, pre-test at different EUT tilt angles were performed and the worst case was chosen for SAR testing. SAR test data submitted represents the most conservative RF exposure level.

<WLAN5G – Single Chain>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Duty Cycle Compensate Factor	Duty Cycle %	Chain	Power Back-off	Power Drift (dB)	SAR _{1g} (W/kg)	Duty Cycle Compensated SAR _{1g} (W/kg)
203	WLAN5G	11a	Bottom Face	0	44	5220	12.65	1.01	99.17	1	OFF	-0.125	1.02	1.03
217	WLAN5G	11a	Bottom Face	0	40	5200	12.33	1.01	99.17	1	OFF	0.048	0.886	0.89
204	WLAN5G	11a	Edge 1	0	44	5220	12.65	1.01	99.17	1	OFF	0.125	0.764	0.77
222	WLAN5G	11a	Edge 1	0	40	5200	12.33	1.01	99.17	1	OFF	0.137	0.729	0.74
255	WLAN5G	11a	Edge 4	0	44	5220	12.65	1.01	99.17	1	OFF	0.161	0.112	0.11
271	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	44	5220	12.65	1.01	99.17	1	OFF	0.179	1.23	1.24
272	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	40	5200	12.33	1.01	99.17	1	OFF	-0.111	1.24	1.25
207	WLAN5G	11a	Bottom Face	0	60	5300	12.65	1.01	99.17	1	OFF	0.001	1.07	1.08
218	WLAN5G	11a	Bottom Face	0	56	5280	12.23	1.01	99.17	1	OFF	0.003	1.1	1.11
208	WLAN5G	11a	Edge 1	0	60	5300	12.65	1.01	99.17	1	OFF	0.14	1.08	1.09
223	WLAN5G	11a	Edge 1	0	56	5280	12.23	1.01	99.17	1	OFF	0.12	1.05	1.06
265	WLAN5G	11a	Edge 4	0	60	5300	12.65	1.01	99.17	1	OFF	0.069	0.168	0.17
277	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	60	5300	12.65	1.01	99.17	1	OFF	0.02	1.27	1.28
283	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	56	5280	12.23	1.01	99.17	1	OFF	0.058	1.23	1.24
209	WLAN5G	11a	Bottom Face	0	116	5580	11.44	1.01	99.17	1	OFF	0.01	1.22	1.23
219	WLAN5G	11a	Bottom Face	0	104	5520	11.08	1.01	99.17	1	OFF	0.018	1.2	1.21
220	WLAN5G	11a	Bottom Face	0	132	5660	10.88	1.01	99.17	1	OFF	0.18	1.16	1.17
210	WLAN5G	11a	Edge 1	0	116	5580	11.44	1.01	99.17	1	OFF	-0.038	1.03	1.04
224	WLAN5G	11a	Edge 1	0	104	5520	11.08	1.01	99.17	1	OFF	0.128	0.831	0.84
225	WLAN5G	11a	Edge 1	0	132	5660	10.88	1.01	99.17	1	OFF	0.08	1.14	1.15
266	WLAN5G	11a	Edge 4	0	116	5580	11.44	1.01	99.17	1	OFF	-0.036	0.216	0.22
278	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	116	5580	11.44	1.01	99.17	1	OFF	0.001	1.18	1.19
284	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	104	5520	11.08	1.01	99.17	1	OFF	0.022	1.12	1.13
285	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	132	5660	10.88	1.01	99.17	1	OFF	-0.087	1.21	1.22
201	WLAN5G	11a	Bottom Face	0	157	5785	11.97	1.01	99.36	1	OFF	-0.07	1.22	1.23
221	WLAN5G	11a	Bottom Face	0	153	5765	11.81	1.01	99.36	1	OFF	0.043	1.27	1.28
254	WLAN5G	11a	Bottom Face	0	161	5805	11.93	1.01	99.36	1	OFF	0.123	1.22	1.23
202	WLAN5G	11a	Edge 1	0	157	5785	11.97	1.01	99.36	1	OFF	-0.07	0.662	0.67
256	WLAN5G	11a	Edge 4	0	157	5785	11.97	1.01	99.36	1	OFF	0.184	0.087	0.09
273	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	157	5785	11.97	1.01	99.36	1	OFF	0.064	1.14	1.15
274	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	153	5765	11.81	1.01	99.36	1	OFF	0.191	1.22	1.23
275	WLAN5G	11a	Curved surface of Edge 1 / Bottom Face tilted	0	161	5805	11.93	1.01	99.36	1	OFF	0.17	1.15	1.16

Note:

1. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. For SAR testing at the curved surface of Edge 1 directly contacted with phantom, pre-test at different EUT tilt angles were performed and the worst case was chosen for SAR testing. SAR test data submitted represents the most conservative RF exposure level.

<WLAN5G – 2TX MIMO>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Duty Cycle Compensate Factor	Duty Cycle %	Chain	Power Back-off	Power Drift (dB)	SAR ₁₀ (W/kg)	Duty Cycle Compensated SAR ₁₀ (W/kg)
211	WLAN5G	11n(20M)	Bottom Face	0	44	5220	14.88	1.02	98.21	1+2	OFF	0.13	0.717	0.73
212	WLAN5G	11n(20M)	Edge 1	0	44	5220	14.88	1.02	98.21	1+2	OFF	0.168	0.647	0.66
257	WLAN5G	11n(20M)	Edge 4	0	44	5220	14.88	1.02	98.21	1+2	OFF	0.029	1.11	1.13
258	WLAN5G	11n(20M)	Edge 4	0	40	5200	14.78	1.02	98.21	1+2	OFF	0.021	1.08	1.10
279	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	44	5220	14.88	1.02	98.21	1+2	OFF	0.136	0.948	0.97
287	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	40	5200	14.78	1.02	98.21	1+2	OFF	0.185	0.891	0.91
286	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	44	5220	14.88	1.02	98.21	1+2	OFF	0.15	0.98	1.00
288	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	40	5200	14.78	1.02	98.21	1+2	OFF	0.131	1.01	1.03
213	WLAN5G	11n(20M)	Bottom Face	0	60	5300	16.37	1.02	98.21	1+2	OFF	0.05	1.2	1.22
227	WLAN5G	11n(20M)	Bottom Face	0	56	5280	16.23	1.02	98.21	1+2	OFF	0.071	1.09	1.11
214	WLAN5G	11n(20M)	Edge 1	0	60	5300	16.37	1.02	98.21	1+2	OFF	-0.03	0.995	1.01
245	WLAN5G	11n(20M)	Edge 1	0	56	5280	16.23	1.02	98.21	1+2	OFF	0.077	1.02	1.04
259	WLAN5G	11n(20M)	Edge 4	0	60	5300	16.37	1.02	98.21	1+2	OFF	0.1	1.05	1.07
260	WLAN5G	11n(20M)	Edge 4	0	56	5280	16.23	1.02	98.21	1+2	OFF	-0.01	1.11	1.13
280	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	60	5300	16.37	1.02	98.21	1+2	OFF	0.045	1.29	1.32
290	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	56	5280	16.23	1.02	98.21	1+2	OFF	0.15	1.19	1.21
289	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	60	5300	16.37	1.02	98.21	1+2	OFF	0.125	1.22	1.24
291	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	56	5280	16.23	1.02	98.21	1+2	OFF	0.181	1.24	1.26
215	WLAN5G	11n(20M)	Bottom Face	0	116	5580	15.25	1.02	98.21	1+2	OFF	0.13	1.24	1.26
228	WLAN5G	11n(20M)	Bottom Face	0	108	5540	15.08	1.02	98.21	1+2	OFF	0.058	1.15	1.17
229	WLAN5G	11n(20M)	Bottom Face	0	132	5660	15.13	1.02	98.21	1+2	OFF	0.02	1.22	1.24
216	WLAN5G	11n(20M)	Edge 1	0	116	5580	15.25	1.02	98.21	1+2	OFF	-0.147	0.946	0.96
240	WLAN5G	11n(20M)	Edge 1	0	108	5540	15.08	1.02	98.21	1+2	OFF	0.111	0.989	1.01
241	WLAN5G	11n(20M)	Edge 1	0	132	5660	15.13	1.02	98.21	1+2	OFF	0.11	1.14	1.16
242	WLAN5G	11n(20M)	Edge 4	0	116	5580	15.25	1.02	98.21	1+2	OFF	0.133	0.947	0.97
243	WLAN5G	11n(20M)	Edge 4	0	108	5540	15.08	1.02	98.21	1+2	OFF	0.11	0.956	0.98
244	WLAN5G	11n(20M)	Edge 4	0	132	5660	15.13	1.02	98.21	1+2	OFF	-0.09	0.956	0.98
281	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	116	5580	15.25	1.02	98.21	1+2	OFF	0.041	0.942	0.96
293	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	108	5540	15.08	1.02	98.21	1+2	OFF	0.147	0.832	0.85
295	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	132	5660	15.13	1.02	98.21	1+2	OFF	0.021	0.881	0.90
292	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	116	5580	15.25	1.02	98.21	1+2	OFF	-0.119	1.28	1.31
294	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	108	5540	15.08	1.02	98.21	1+2	OFF	0.127	1.09	1.11
296	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	132	5660	15.13	1.02	98.21	1+2	OFF	0.063	1.23	1.25

Note:

1. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. For SAR testing at the curved surface of Edge1 and Edge4 directly contacted with phantom, pre-test at different EUT tilt angles were performed and the worst case was chosen for SAR testing. SAR test data submitted represents the most conservative RF exposure level.

<WLAN5G – 2TX MIMO>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Duty Cycle Compensate Factor	Duty Cycle %	Chain	Power Back-off	Power Drift (dB)	SAR ₁₀ (W/kg)	Duty Cycle Compensated SAR ₁₀ (W/kg)
205	WLAN5G	11n(20M)	Bottom Face	0	157	5785	15.68	1.02	98.21	1+2	OFF	0.174	1.26	1.29
230	WLAN5G	11n(20M)	Bottom Face	0	153	5765	15.67	1.02	98.21	1+2	OFF	0.075	1.24	1.26
263	WLAN5G	11n(20M)	Bottom Face	0	161	5805	15.64	1.02	98.21	1+2	OFF	0.018	1.25	1.28
206	WLAN5G	11n(20M)	Edge 1	0	157	5785	15.68	1.02	98.21	1+2	OFF	0.158	0.778	0.79
238	WLAN5G	11n(20M)	Edge 4	0	157	5785	15.68	1.02	98.21	1+2	OFF	0.08	0.87	0.89
239	WLAN5G	11n(20M)	Edge 4	0	153	5765	15.67	1.02	98.21	1+2	OFF	0.05	0.921	0.94
261	WLAN5G	11n(20M)	Edge 4	0	161	5805	15.64	1.02	98.21	1+2	OFF	-0.03	0.87	0.89
282	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	157	5785	15.68	1.02	98.21	1+2	OFF	0.054	0.918	0.94
300	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	153	5765	15.67	1.02	98.21	1+2	OFF	0.05	0.744	0.76
301	WLAN5G	11n(20M)	Curved surface of Edge 4 / Bottom Face tilted	0	161	5805	15.64	1.02	98.21	1+2	OFF	0.02	0.705	0.72
297	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	157	5785	15.68	1.02	98.21	1+2	OFF	-0.111	1.11	1.13
298	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	153	5765	15.67	1.02	98.21	1+2	OFF	0.083	1.02	1.04
299	WLAN5G	11n(20M)	Curved surface of Edge 1 / Bottom Face tilted	0	161	5805	15.64	1.02	98.21	1+2	OFF	0.062	1.2	1.22

Note:

1. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. For SAR testing at the curved surface of Edge1 and Edge4 directly contacted with phantom, pre-test at different EUT tilt angles were performed and the worst case was chosen for SAR testing. SAR test data submitted represents the most conservative RF exposure level.

11.2 Simultaneous Transmission SAR Analysis and Measurements

No.	Applicable Simultaneous Transmission Combination
1.	WWAN (data) + BT
2.	WLAN 2TX MIMO

Note:

1. WWAN Radio (GPRS/EGPRS/UMTS/LTE) cannot transmit simultaneously with WiFi Radio; Simultaneous transmission of WWAN+2.4GHz WLAN, WWAN+5GHz WLAN, are not supported
2. WLAN and BT share the same antenna, however, WiFi Radio cannot transmit simultaneously with Bluetooth Radio.
3. GPRS/EDGE, UMTS and LTE share the same antenna, and cannot transmit simultaneously.
4. EUT will choose either WLAN2.4G or WLAN5G according to the network signal condition, therefore, they will not transmit simultaneously.
5. Per KDB 447498 3)b)ii)1), Bluetooth average power is $<60/f$, and the distance of Bluetooth antenna to WWAN antenna is $>5\text{cm}$, thus simultaneous transmission consideration is excluded
6. Per KDB 248227 MIMO SAR procedure, WLAN 2TX MIMO was evaluated and the results is listed in section 11.1.

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12. Uncertainty Assessment

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A 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 12.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multiplying Factor ^(a)	1/ κ ^(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 12.1 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 purposes of this document, a coverage factor two is used, which corresponds to a confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables:

Error Description	Uncertainty	Probability	Divisor	Ci	Ci	Standard	Standard
	Value (±%)	Distribution		(1g)	(10g)	Uncertainty (1g)	Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						± 22.0 %	± 21.5 %

Table 12.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty	Probability	Divisor	Ci	Ci	Standard	Standard
	Value (±%)	Distribution		(1g)	(10g)	Uncertainty (1g)	Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						± 25.6 %	± 25.2 %

Table 12.3 Uncertainty Budget of DASY for frequency range 3 GHz to 6 GHz

13. 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. 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- [4] FCC OET Bulletin 65 (Edition 97-01) Supplement C (Edition 01-01), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", June 2001
- [5] SPEAG DASY System Handbook
- [6] FCC KDB 248227 D01 v01r02, "SAR Measurement Procedures for 802.11 a/b/g Transmitters", May 2007
- [7] FCC KDB 447498 D01 v04, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", November 2009
- [8] FCC KDB 616217 D03 v01, "SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers", November 2009
- [9] FCC KDB 941225 D01 v02, "SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA", October 2007
- [10] FCC KDB 941225 D03 v01, "Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE", December 2008
- [11] FCC KDB 941225 D04 v01, "Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode", January 27 2010
- [12] FCC KDB 941225 D05 v01, "SAR Test Considerations for LTE Handsets and Data Modems", December 2010
- [13] FCC KDB 941225 D07 01, "SAR Evaluation Procedure for UMPC Mini-Tablet Devices", April 2011
- [14] FCC KDB 388624 D02, "Permit But Ask List", December 2011.

Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Body_750MHz_120724**DUT: D750V3-SN:1012**

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: MSL_750_120724 Medium parameters used: $f = 750$ MHz; $\sigma = 0.962$ mho/m; $\epsilon_r = 53.914$; $\rho =$

1000 kg/m³

Ambient Temperature : 22.4 °C; Liquid Temperature : 21.4 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/5/29;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.29 mW/g

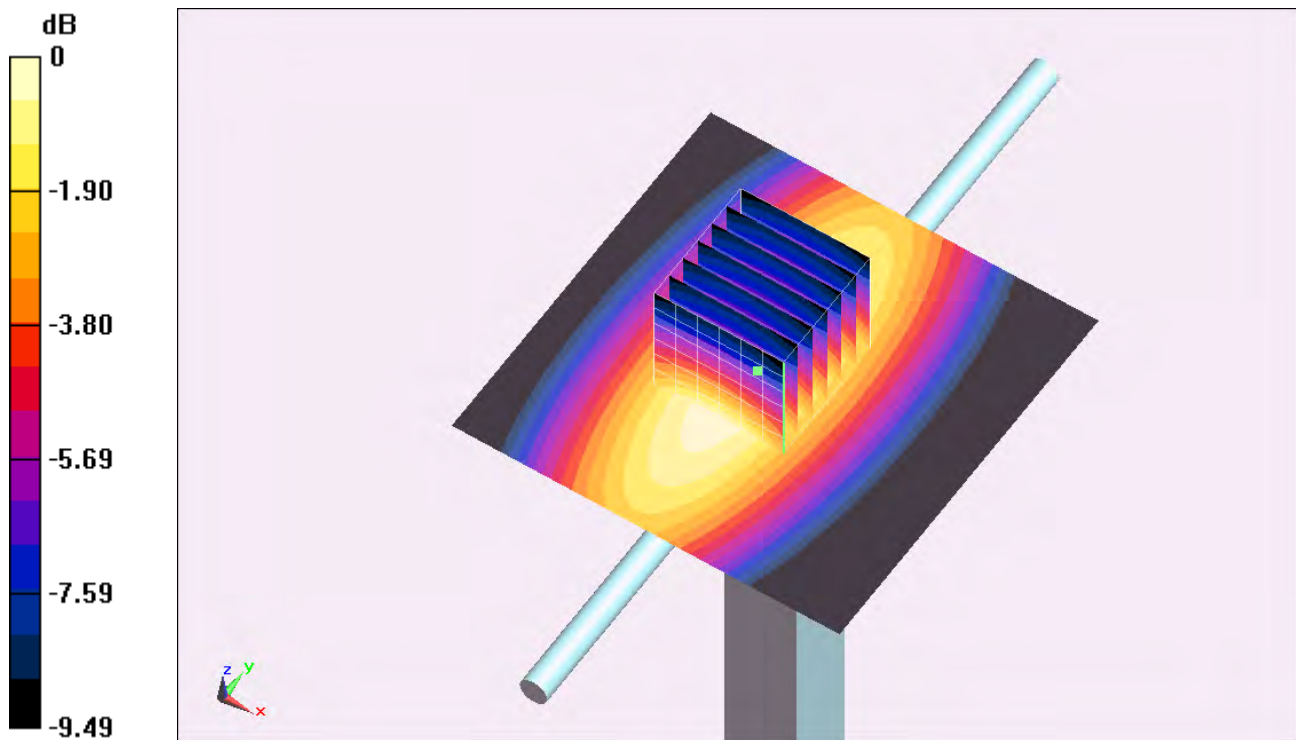
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 49.916 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 3.054 mW/g

SAR(1 g) = 2.14 mW/g; SAR(10 g) = 1.44 mW/g

Maximum value of SAR (measured) = 2.31 mW/g



0 dB = 2.31 mW/g = 7.27 dB mW/g

System Check_Body_750MHz_120816

DUT: D750V3-SN:1012

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: MSL_750_120816 Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.963 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/5/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0_Front; Type: QD 0VA 002 AA; Serial: TP-1131
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.53 mW/g

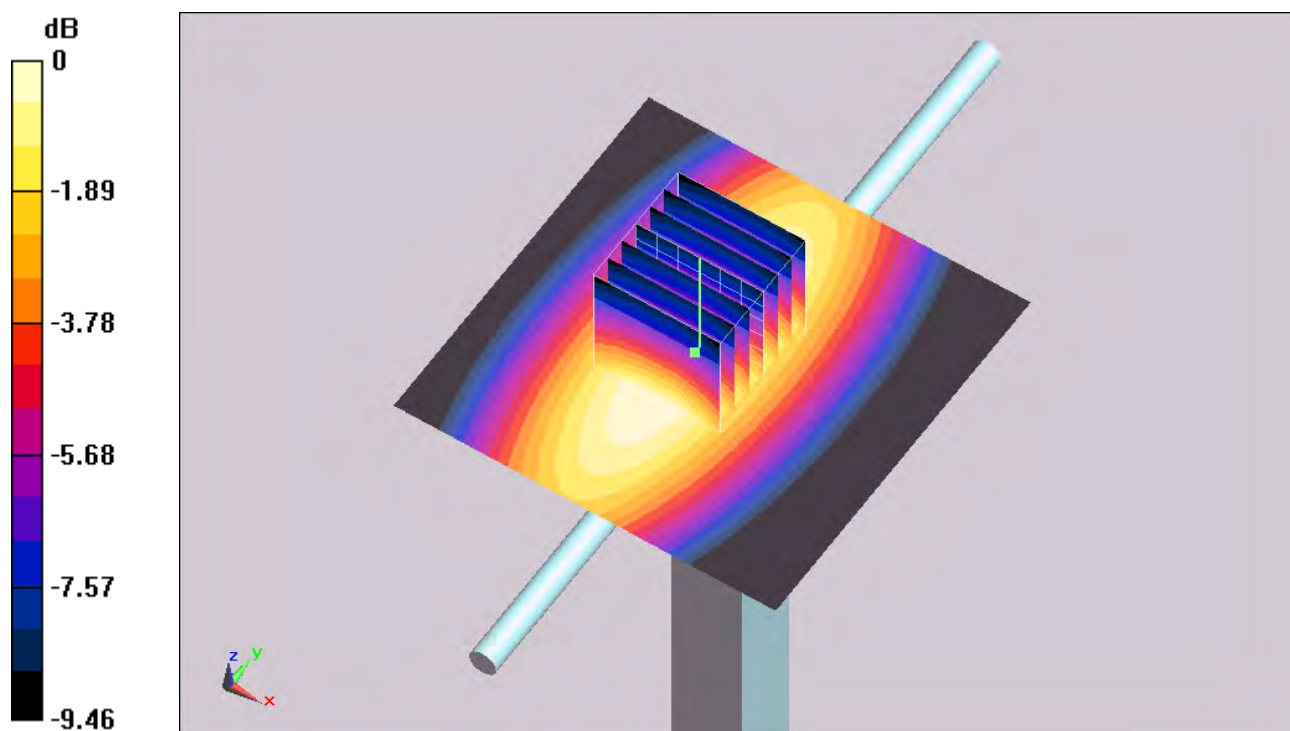
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 50 V/m ; Power Drift = 0.128 dB

Peak SAR (extrapolated) = 3.23 W/kg

SAR(1 g) = 2.28 mW/g ; SAR(10 g) = 1.54 mW/g

Maximum value of SAR (measured) = 2.42 mW/g



0 dB = 2.42mW/g

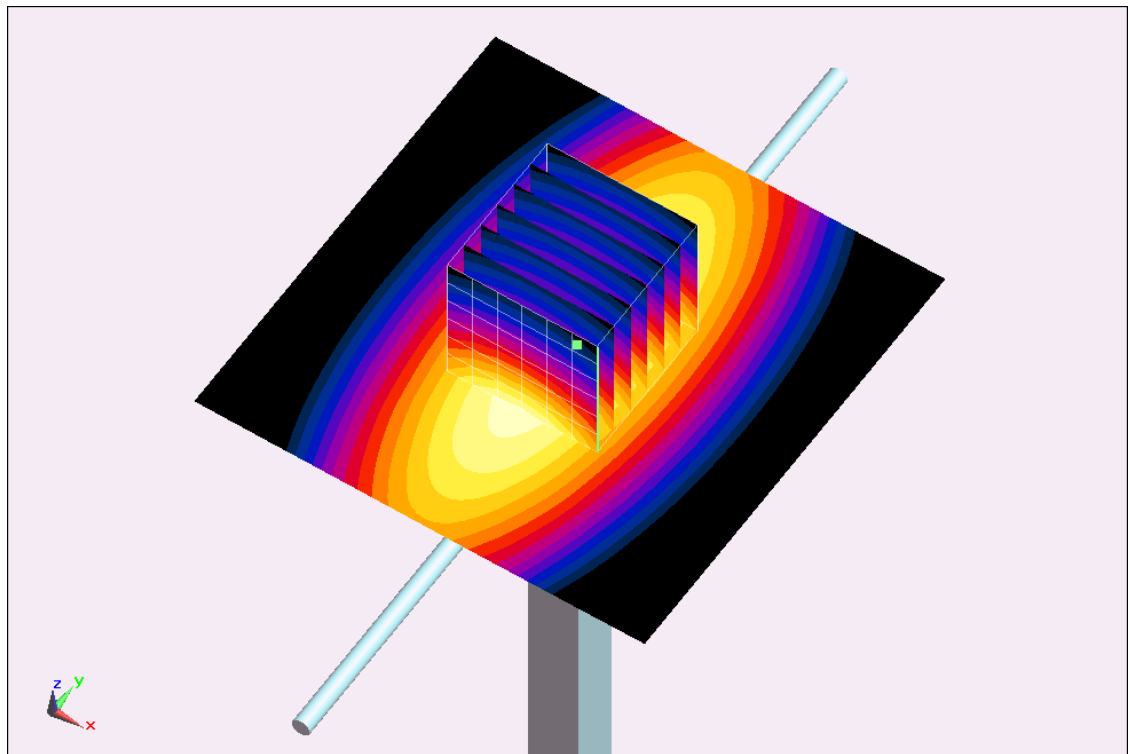
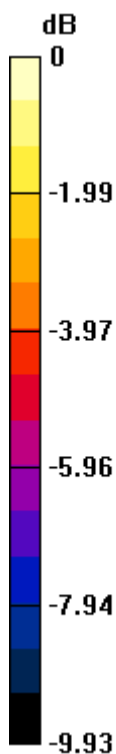
System Check_Body_835MHz_120724**DUT: D835V2-SN:499**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL_835_120724 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.983 \text{ mho/m}$; $\epsilon_r = 54.388$; $\rho =$ 1000 kg/m^3 Ambient Temperature : $22.3 \text{ }^\circ\text{C}$; Liquid Temperature : $21.3 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(6.08, 6.08, 6.08); Calibrated: 2012/5/29;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (interpolated) = 2.72 mW/g **Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 54.619 V/m ; Power Drift = -0.04 dB Peak SAR (extrapolated) = 3.532 mW/g **SAR(1 g) = 2.51 mW/g ; SAR(10 g) = 1.67 mW/g** Maximum value of SAR (measured) = 2.72 mW/g  $0 \text{ dB} = 2.72 \text{ mW/g} = 8.69 \text{ dB mW/g}$

System Check_Body_835MHz_120815

DUT: D835V2-SN:499

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL_835_120815 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.996 \text{ mho/m}$; $\epsilon_r = 55.4$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(6.08, 6.08, 6.08); Calibrated: 2012/5/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0_Front; Type: QD 0VA 002 AA; Serial: TP-1131
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.76 mW/g

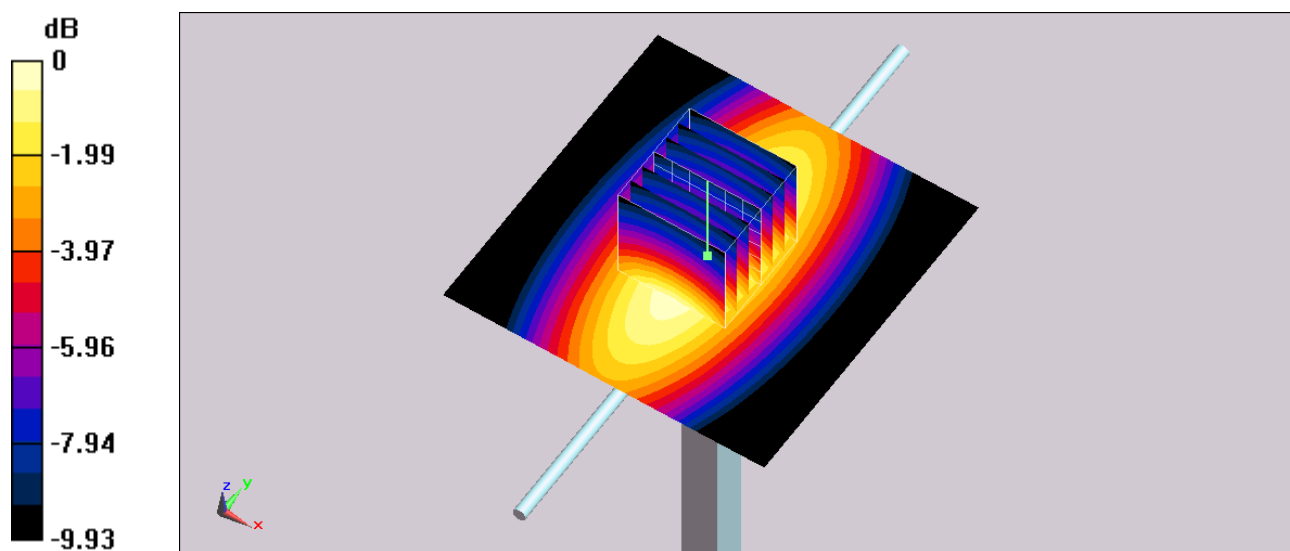
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.7 V/m ; Power Drift = -0.043 dB

Peak SAR (extrapolated) = 3.59 W/kg

SAR(1 g) = 2.55 mW/g ; SAR(10 g) = 1.69 mW/g

Maximum value of SAR (measured) = 2.76 mW/g



0 dB = 2.76mW/g

System Check_Body_835MHz_120821

DUT: D835V2-SN:499

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL_850_120821 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.994 \text{ mho/m}$; $\epsilon_r = 54.7$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(8.99, 8.99, 8.99); Calibrated: 2012/6/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.69 mW/g

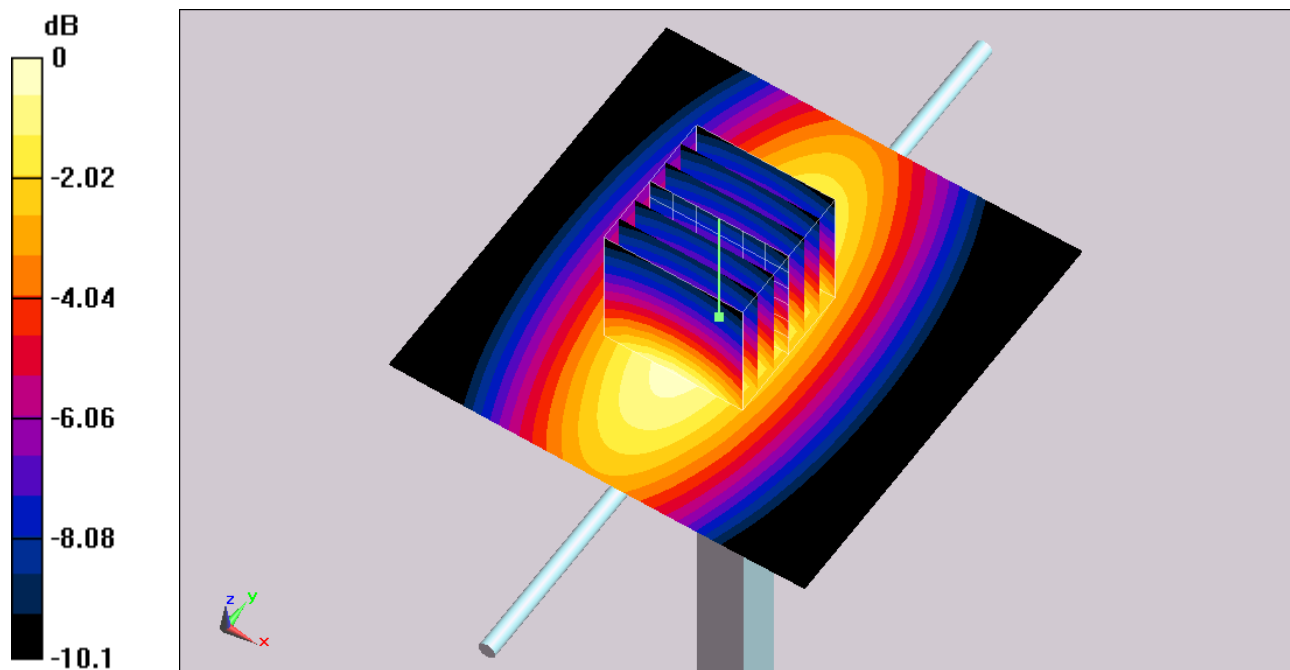
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 51.8 V/m ; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 3.72 W/kg

SAR(1 g) = 2.5 mW/g ; SAR(10 g) = 1.63 mW/g

Maximum value of SAR (measured) = 2.7 mW/g



0 dB = 2.7mW/g

System Check_Body_1750MHz_120726

DUT: D1750V2-SN:1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: MSL_1750_120726 Medium parameters used: $f = 1750$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.7$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6R - SN1788; ConvF(4.29, 4.29, 4.29); Calibrated: 2012/1/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2011/11/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12 mW/g

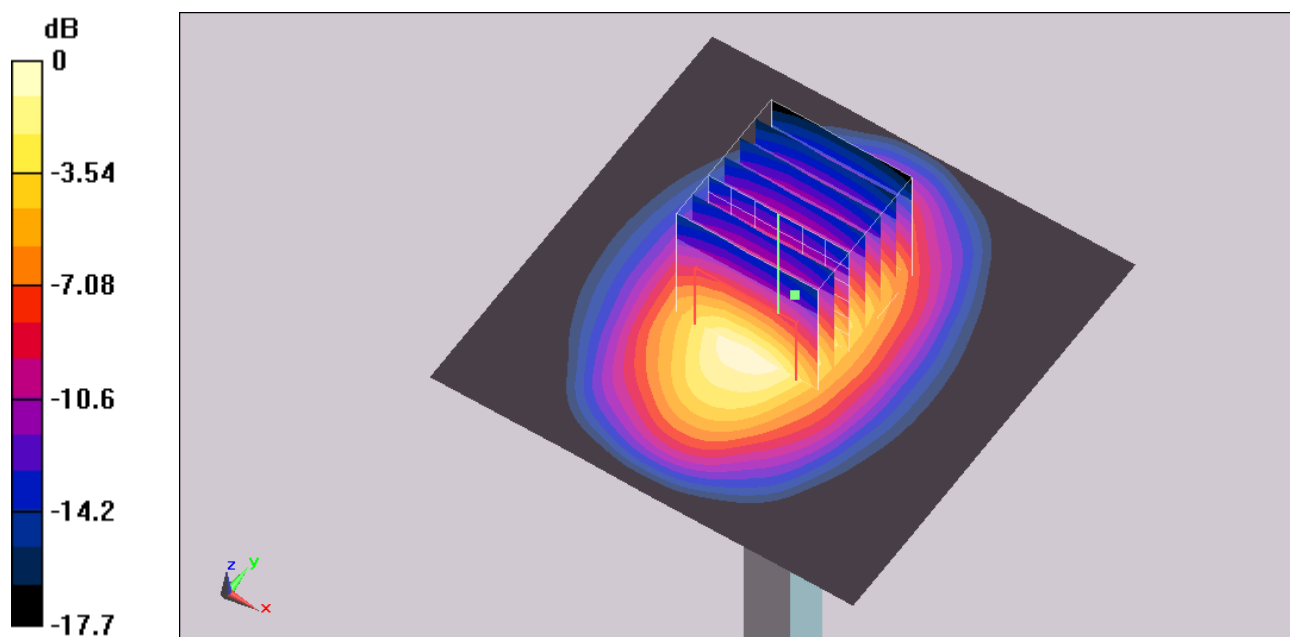
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.1 V/m; Power Drift = -0.0087 dB

Peak SAR (extrapolated) = 14.9 W/kg

SAR(1 g) = 9.83 mW/g; SAR(10 g) = 5.38 mW/g

Maximum value of SAR (measured) = 11.1 mW/g



0 dB = 11.1mW/g

System Check_Body_1750MHz_120816

DUT: D1750V2-SN:1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: MSL_1750_120816 Medium parameters used: $f = 1750$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 51.3$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(4.81, 4.81, 4.81); Calibrated: 2012/5/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 10.4 mW/g

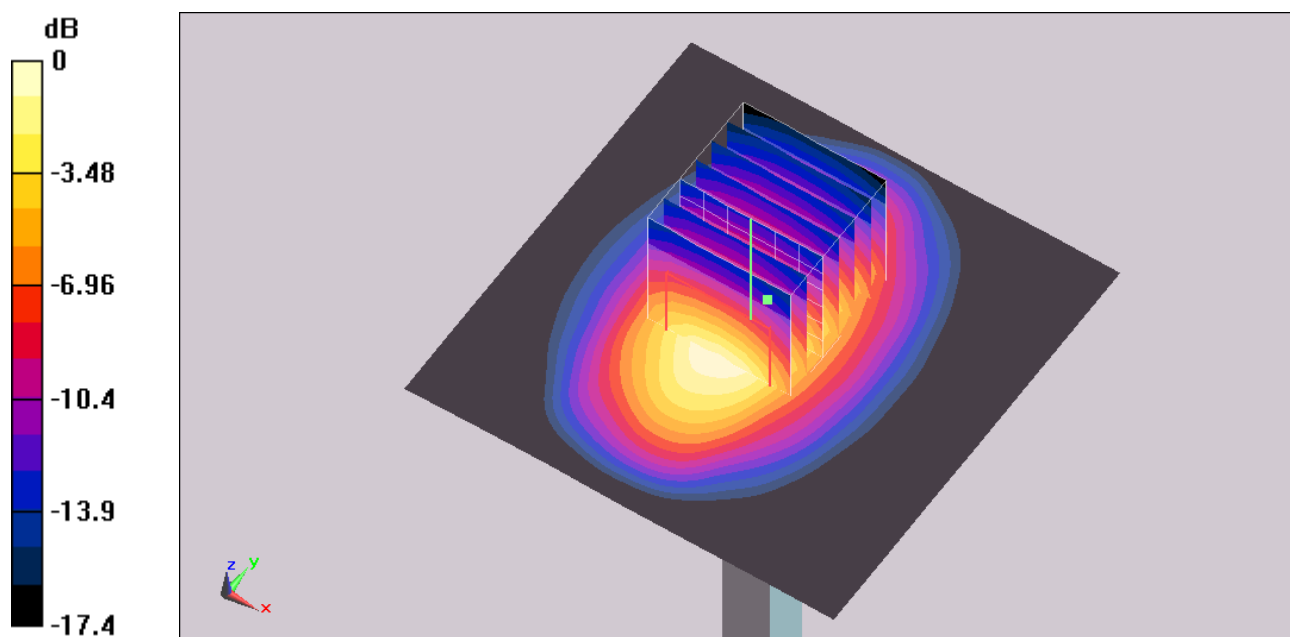
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 85.9 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 13.4 W/kg

SAR(1 g) = 8.58 mW/g; SAR(10 g) = 4.68 mW/g

Maximum value of SAR (measured) = 9.81 mW/g



0 dB = 9.81mW/g

System Check_Body_1750MHz_120821

DUT: D1750V2-SN:1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: MSL_1750_120821 Medium parameters used: $f = 1750 \text{ MHz}$; $\sigma = 1.51 \text{ mho/m}$; $\epsilon_r = 52.2$;

$\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $22.5 \text{ }^\circ\text{C}$; Liquid Temperature : $21.5 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(7.71, 7.71, 7.71); Calibrated: 2012/6/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 11.1 mW/g

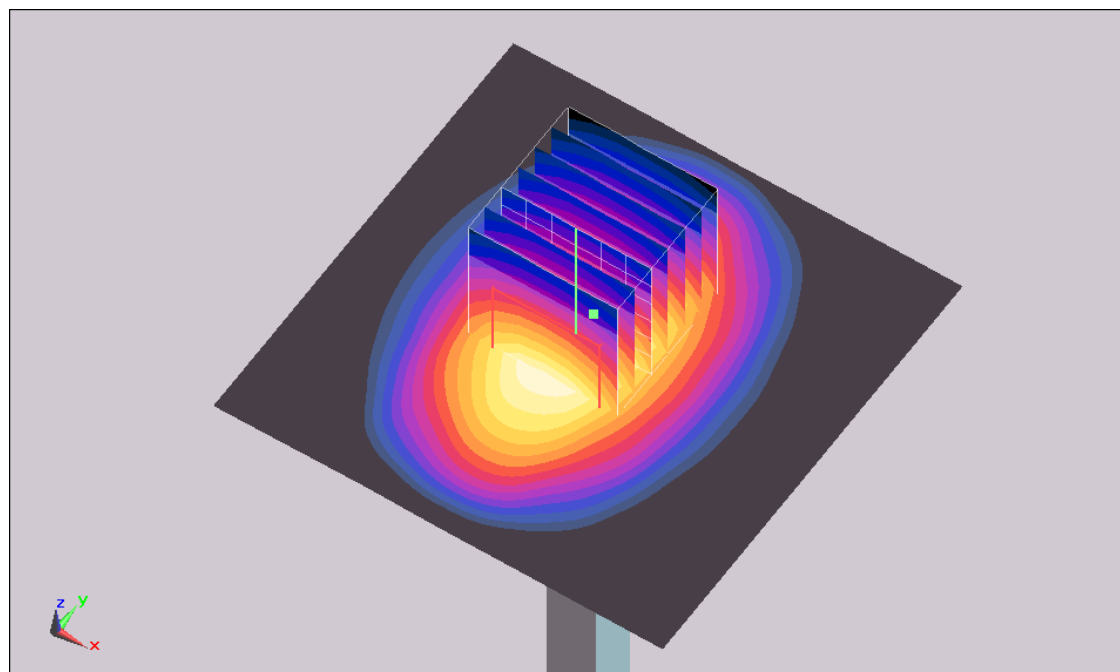
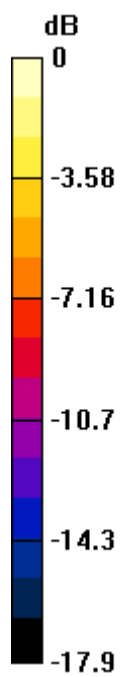
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 81.3 V/m ; Power Drift = 0.00239 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 9.12 mW/g ; SAR(10 g) = 4.8 mW/g

Maximum value of SAR (measured) = 10.1 mW/g



0 dB = 10.1mW/g

System Check_Body_1900MHz_120725**DUT: D1900V2-SN:5d041**

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL_1900_120725 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.516$ mho/m; $\epsilon_r = 53.631$; ρ $= 1000$ kg/m³

Ambient Temperature : 22.4 °C; Liquid Temperature : 21.4 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(4.58, 4.58, 4.58); Calibrated: 2012/5/29;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 10.9 mW/g

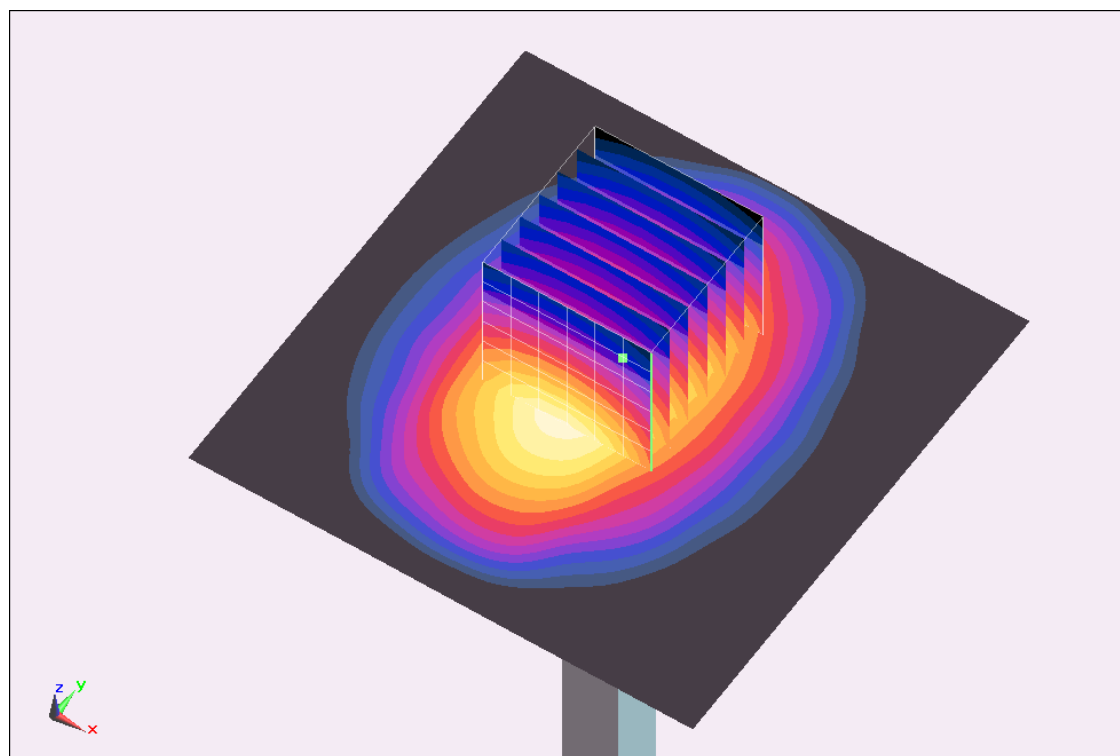
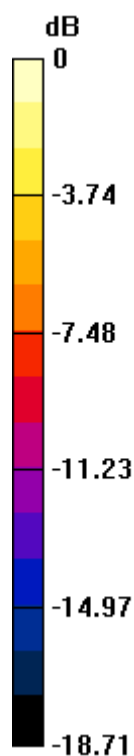
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.729 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 15.082 mW/g

SAR(1 g) = 9.32 mW/g; SAR(10 g) = 4.89 mW/g

Maximum value of SAR (measured) = 10.7 mW/g



0 dB = 10.7 mW/g = 20.59 dB mW/g

System Check_Body_1900MHz_120816

DUT: D1900V2-SN:5d041

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL_1900_120816 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1787; ConvF(4.58, 4.58, 4.58); Calibrated: 2012/5/29
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.5 mW/g

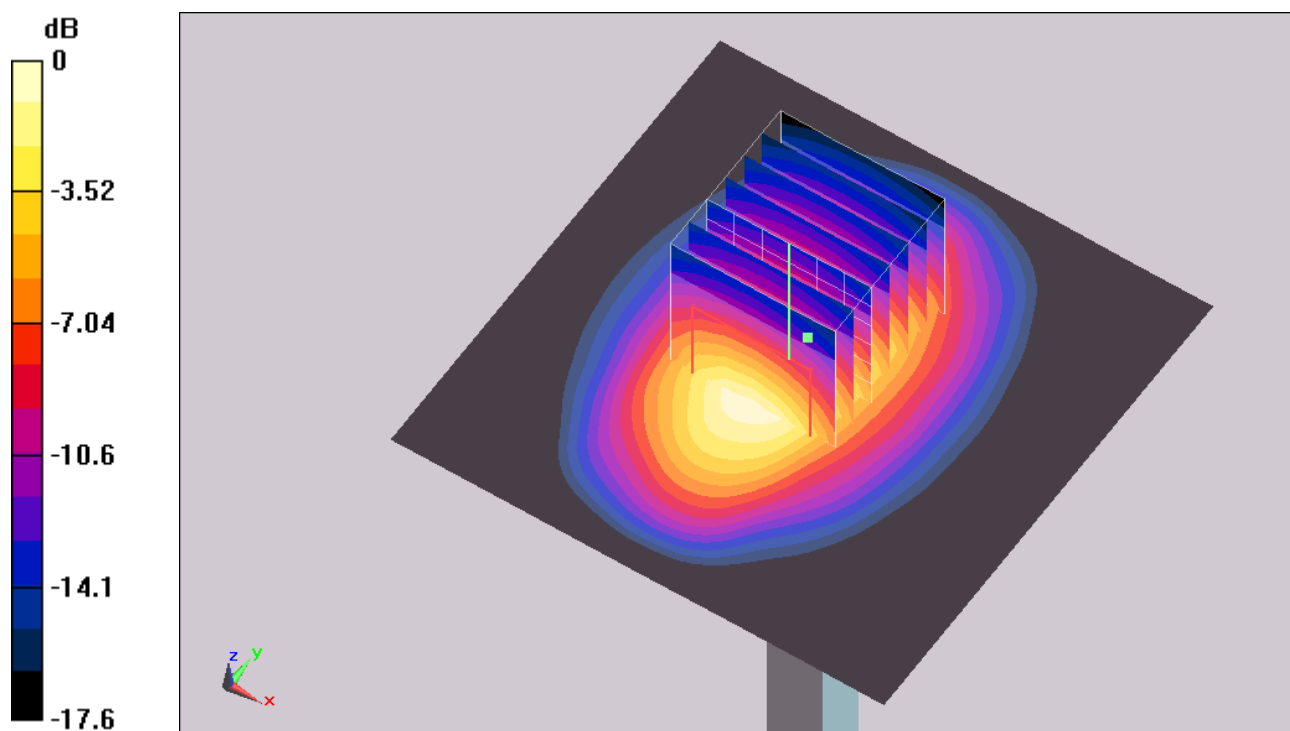
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.4 V/m; Power Drift = 0.0084 dB

Peak SAR (extrapolated) = 15 W/kg

SAR(1 g) = 9.46 mW/g; SAR(10 g) = 5.11 mW/g

Maximum value of SAR (measured) = 10.8 mW/g



0 dB = 10.8mW/g

System Check_Body_1900MHz_120820

DUT: D1900V2-SN:5d041

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL_1900_120820 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 54.6$;

$\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(7.29, 7.29, 7.29); Calibrated: 2012/6/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 11.1 mW/g

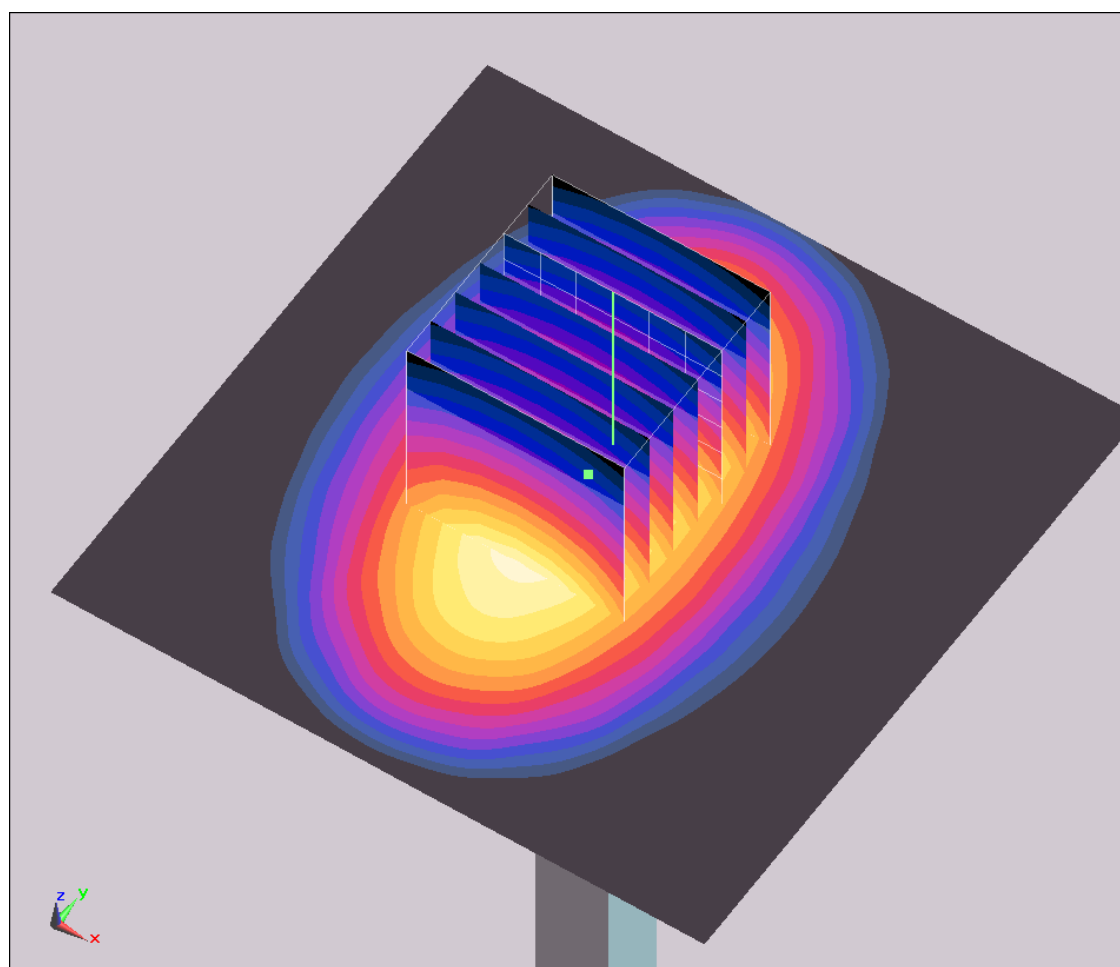
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 83 V/m ; Power Drift = 0.116 dB

Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 10.1 mW/g ; SAR(10 g) = 5.57 mW/g

Maximum value of SAR (measured) = 11.1 mW/g



0 dB = 11.1mW/g

System Check_Body_2450MHz_120725

DUT: D2450V2-SN:736

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

Medium: MSL_2450_120725 Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 53.8$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $22.5 \text{ }^\circ\text{C}$; Liquid Temperature : $21.5 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3819; ConvF(7.4, 7.4, 7.4); Calibrated: 2011/11/16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 14.4 mW/g

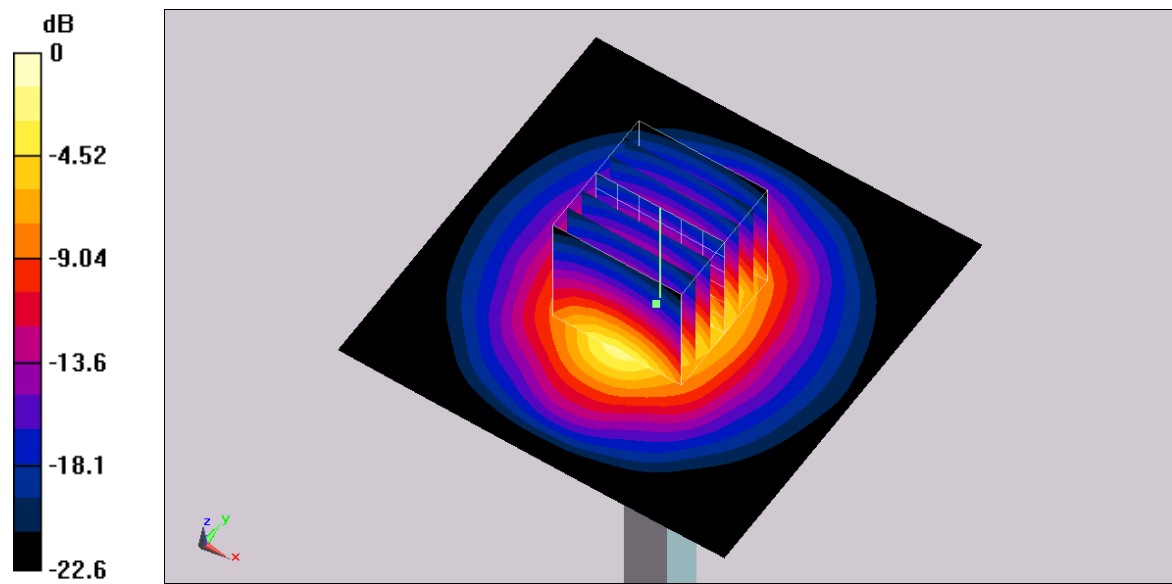
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 85.8 V/m ; Power Drift = -0.056 dB

Peak SAR (extrapolated) = 27.1 W/kg

SAR(1 g) = 12.6 mW/g ; SAR(10 g) = 5.76 mW/g

Maximum value of SAR (measured) = 14.4 mW/g



0 dB = 14.4mW/g

System Check_Body_2450MHz_120726**DUT: D2450V2-SN:736**

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

Medium: MSL_2450_120726 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.973$ mho/m; $\epsilon_r =$

52.342; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(7.1, 7.1, 7.1); Calibrated: 2012/6/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.0 mW/g

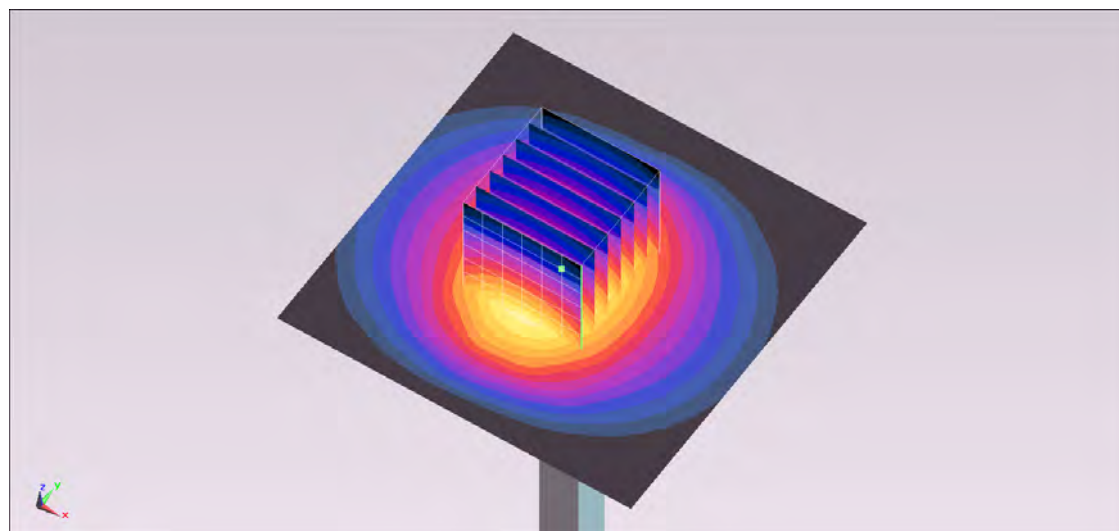
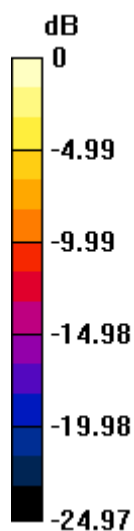
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 84.482 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 30.871 mW/g

SAR(1 g) = 13.1 mW/g; SAR(10 g) = 5.68 mW/g

Maximum value of SAR (measured) = 14.7 mW/g



0 dB = 14.7 mW/g = 23.35 dB mW/g

System Check_Body_2450MHz_120913

DUT: D2450V2-SN:736

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

Medium: MSL_2450_120913 Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.96 \text{ mho/m}$; $\epsilon_r = 53.8$;

$\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $22.5 \text{ }^\circ\text{C}$; Liquid Temperature : $21.5 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(7.1, 7.1, 7.1); Calibrated: 2012/6/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QD 0VA 002 AA; Serial: TP-1131
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 14.8 mW/g

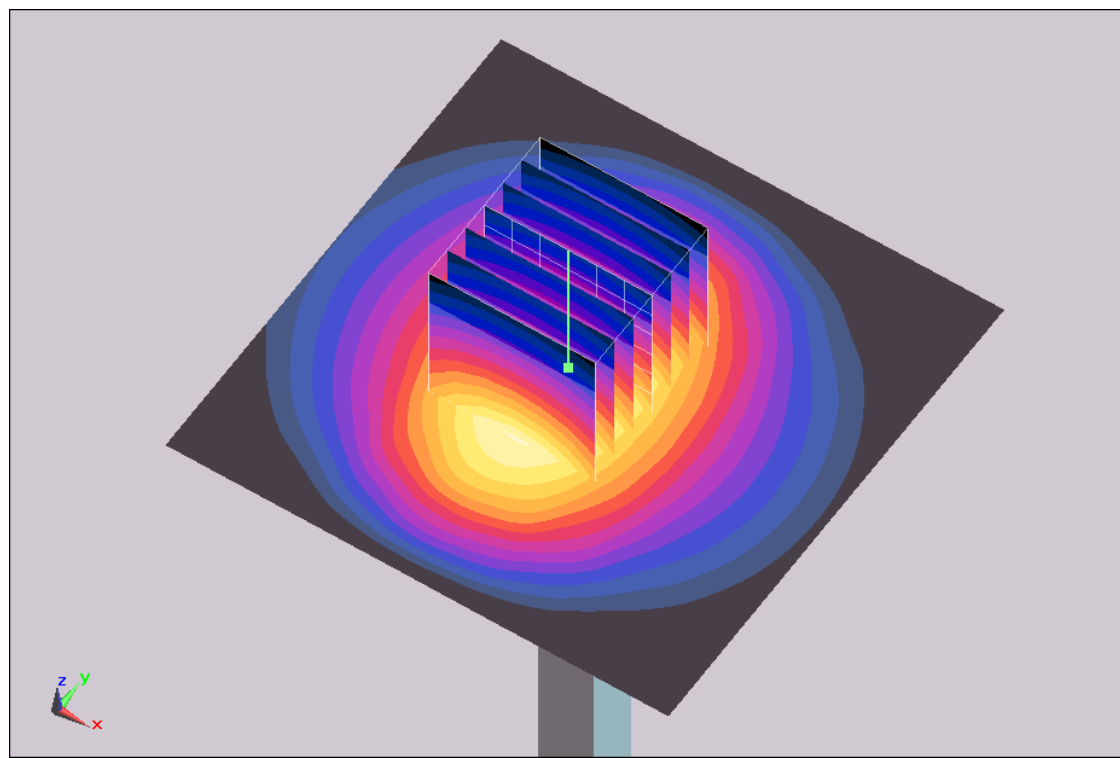
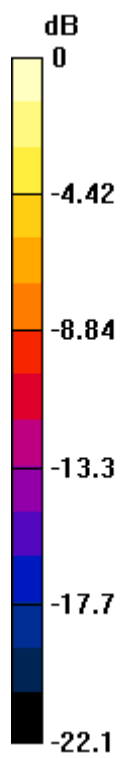
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 83.8 V/m ; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 28.5 W/kg

SAR(1 g) = 13 mW/g ; SAR(10 g) = 6.2 mW/g

Maximum value of SAR (measured) = 14.4 mW/g



0 dB = 14.4mW/g

System Check_Body_2450MHz_120915**DUT: D2450V2-SN:736**

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

Medium: MSL_2450_120915 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.969$ mho/m; $\epsilon_r = 52.278$; ρ $= 1000$ kg/m³

Ambient Temperature : 22.5 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(7.1, 7.1, 7.1); Calibrated: 2012/6/21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 15.0 mW/g

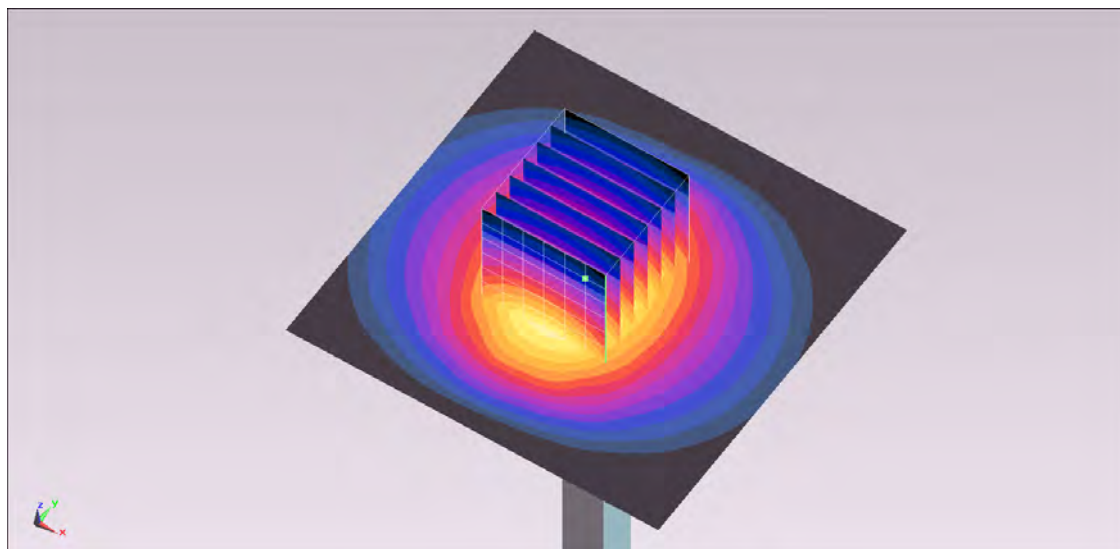
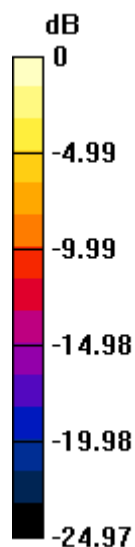
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 84.482 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 30.811 mW/g

SAR(1 g) = 13 mW/g; SAR(10 g) = 5.67 mW/g

Maximum value of SAR (measured) = 14.7 mW/g



0 dB = 14.7 mW/g = 23.35 dB mW/g

System Check_Body_5200MHz_120724**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120724 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.373$ mho/m; $\epsilon_r = 48.526$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(4.2, 4.2, 4.2); Calibrated: 2012/6/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 33.3 mW/g

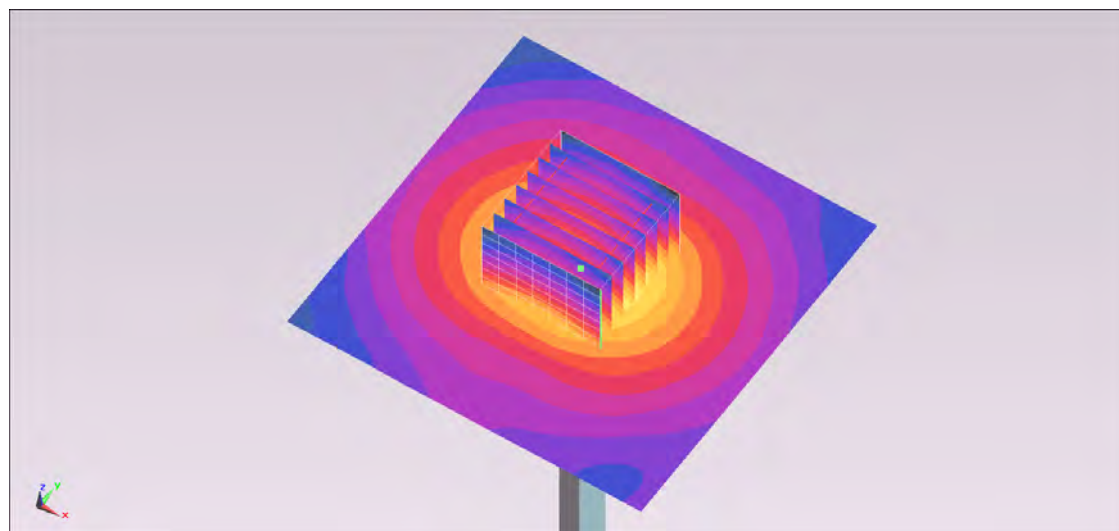
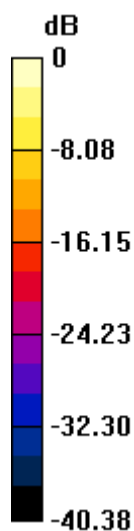
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 89.582 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 60.899 mW/g

SAR(1 g) = 18.3 mW/g; SAR(10 g) = 5.19 mW/g

Maximum value of SAR (measured) = 30.1 mW/g



0 dB = 30.1 mW/g = 29.57 dB mW/g

System Check_Body_5200MHz_120725**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120725 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.297$ mho/m; $\epsilon_r = 49.185$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.6 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(4.2, 4.2, 4.2); Calibrated: 2012/6/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 32.8 mW/g

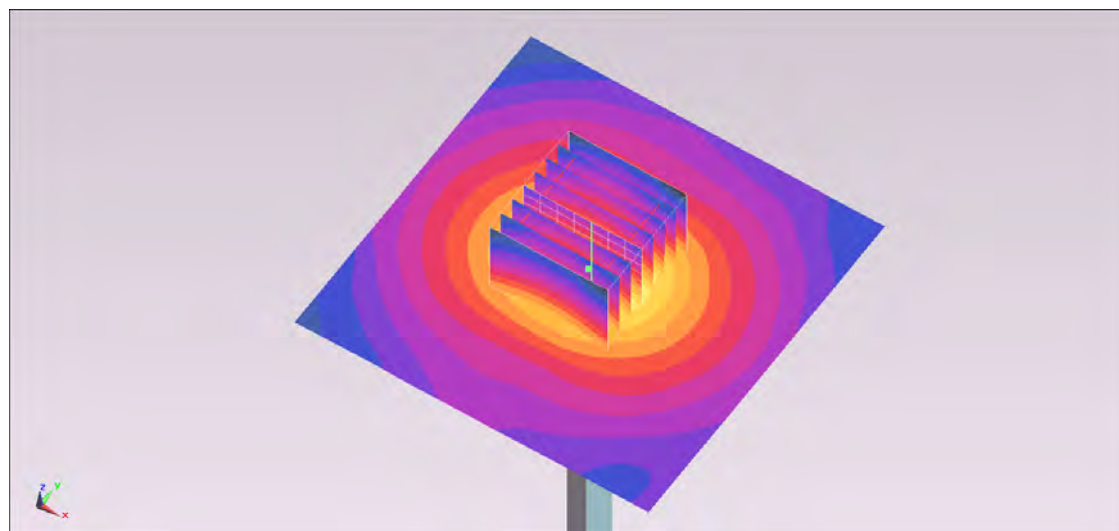
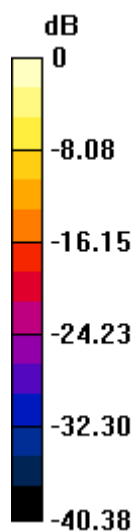
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 89.582 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 60.047 mW/g

SAR(1 g) = 18 mW/g; SAR(10 g) = 5.12 mW/g

Maximum value of SAR (measured) = 29.7 mW/g



0 dB = 29.7 mW/g = 29.46 dB mW/g

System Check_Body_5200MHz_120913

DUT: D5GHzV2-SN:1006

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

Medium: MSL_5G_120913 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.3 \text{ mho/m}$; $\epsilon_r = 49.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(4.2, 4.2, 4.2); Calibrated: 2012/6/21
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 34 mW/g

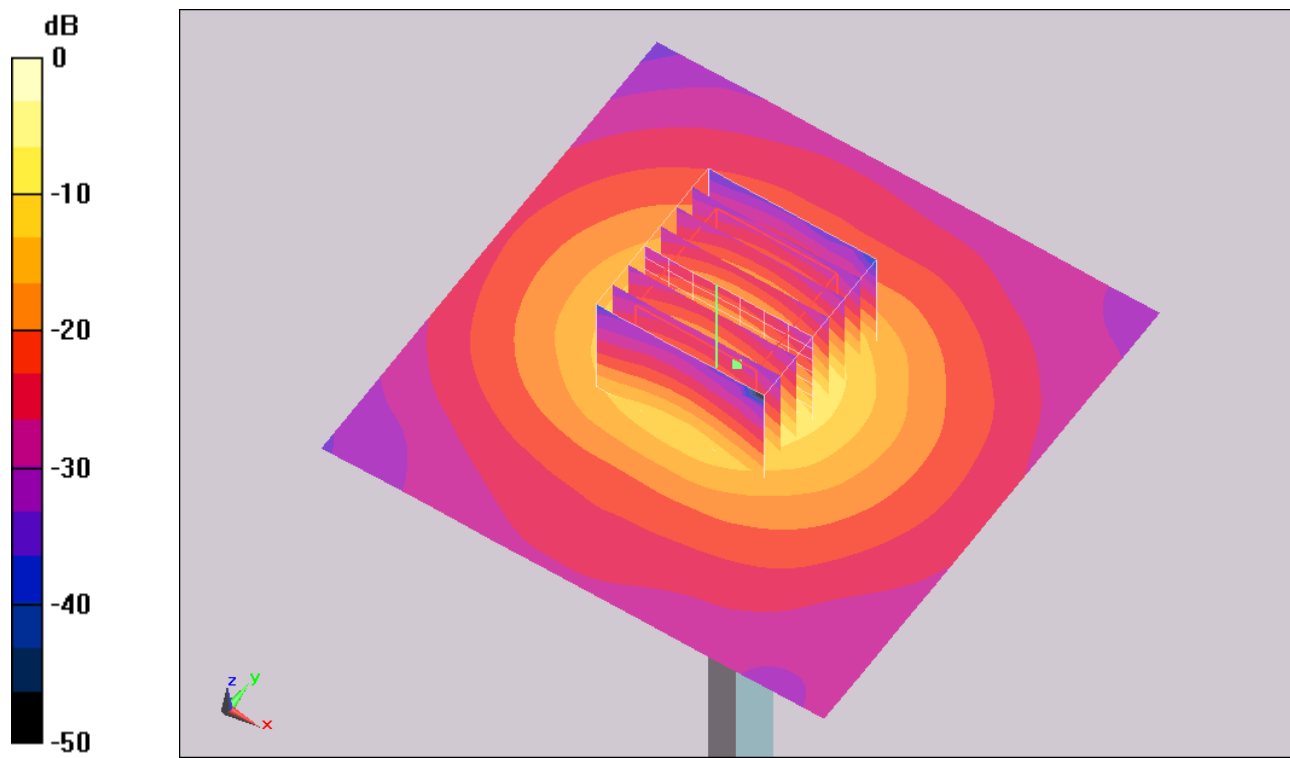
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4.3\text{mm}$, $dy=4.3\text{mm}$, $dz=3\text{mm}$

Reference Value = 82.5 V/m ; Power Drift = -0.00185 dB

Peak SAR (extrapolated) = 59.7 W/kg

SAR(1 g) = 18.6 mW/g ; SAR(10 g) = 5.33 mW/g

Maximum value of SAR (measured) = 31.1 mW/g



0 dB = 31.1mW/g

System Check_Body_5200MHz_120914**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120914 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.162$ mho/m; $\epsilon_r = 48.492$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(4.2, 4.2, 4.2); Calibrated: 2012/6/21;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 34.0 mW/g

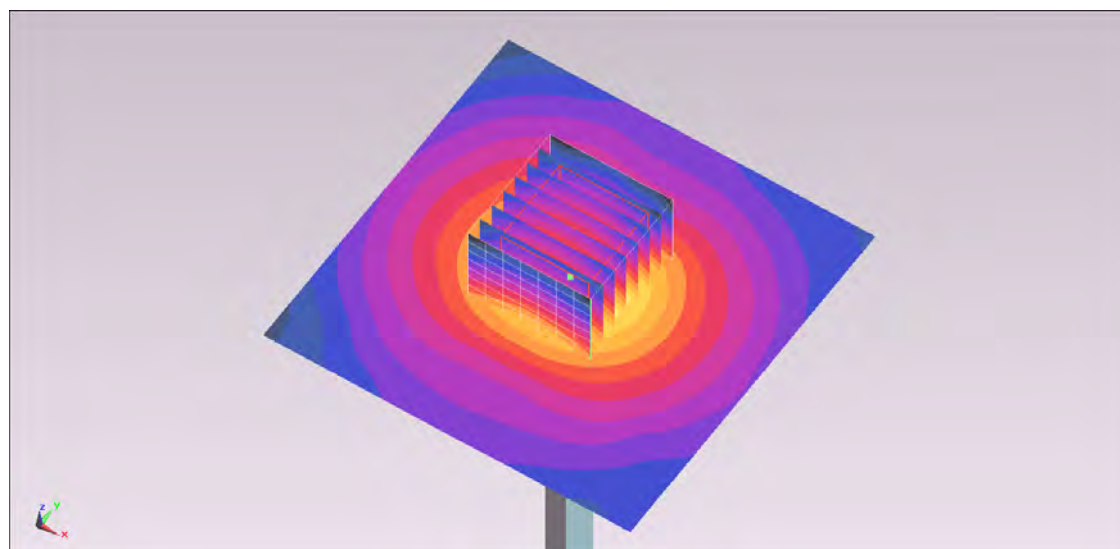
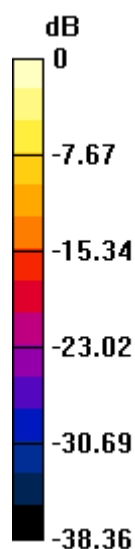
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 85.344 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 65.064 mW/g

SAR(1 g) = 19 mW/g; SAR(10 g) = 5.27 mW/g

Maximum value of SAR (measured) = 32.4 mW/g



0 dB = 32.4 mW/g = 30.21 dB mW/g

System Check_Body_5200MHz_120917**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120917 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.297$ mho/m; $\epsilon_r = 49.185$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(4.2, 4.2, 4.2); Calibrated: 2012/6/21;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 34.0 mW/g

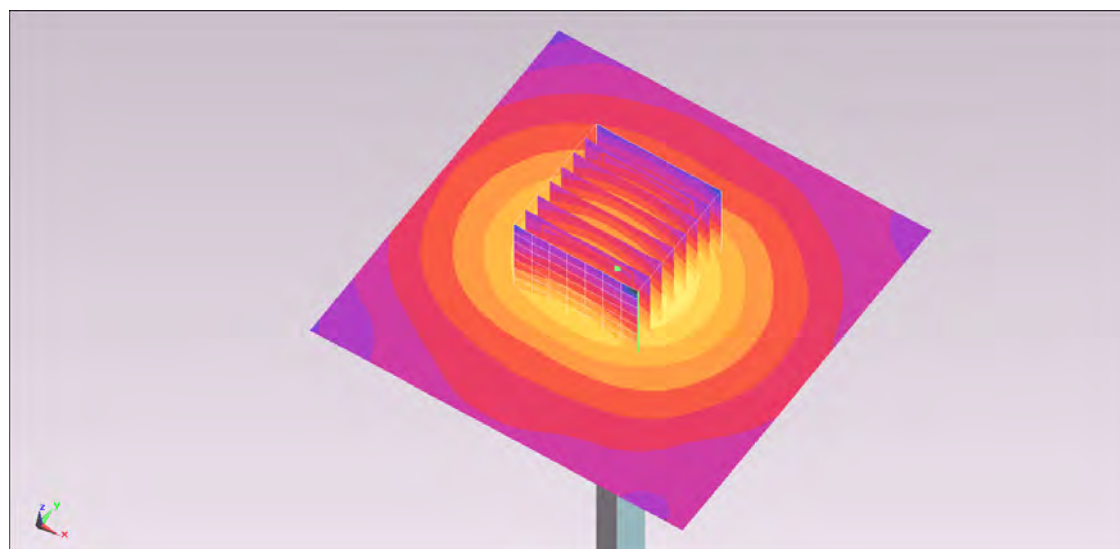
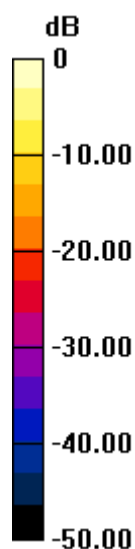
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 82.488 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 59.753 mW/g

SAR(1 g) = 18.6 mW/g; SAR(10 g) = 5.33 mW/g

Maximum value of SAR (measured) = 31.1 mW/g



0 dB = 31.1 mW/g = 29.86 dB mW/g

System Check_Body_5200MHz_120917

DUT: Dipole 5GHz

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

Medium: MSL_5G_120917 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.28 \text{ mho/m}$; $\epsilon_r = 48.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3578; ConvF(3.93, 3.93, 3.93); Calibrated: 2012/6/21
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0_Front; Type: QD 0VA 002 AA; Serial: TP-1131
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 28.3 mW/g

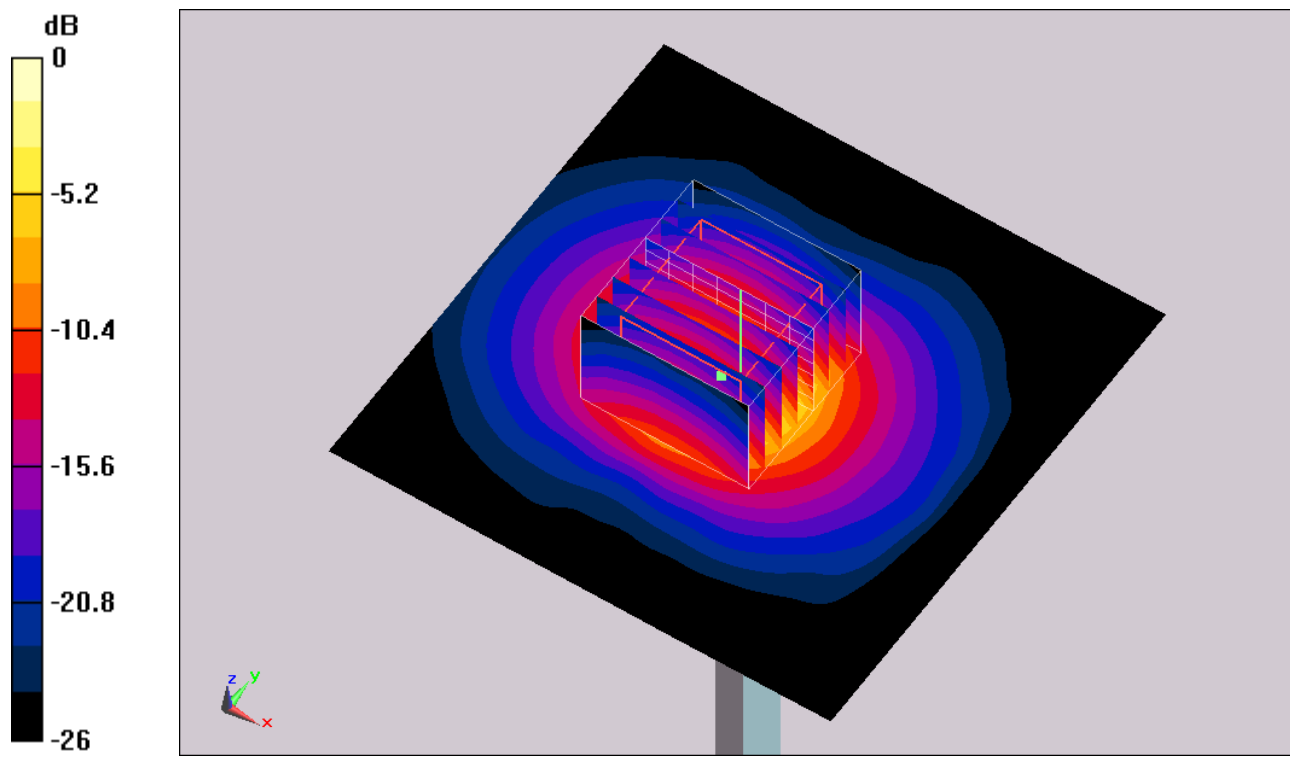
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4.3\text{mm}$, $dy=4.3\text{mm}$, $dz=3\text{mm}$

Reference Value = 0.608 V/m ; Power Drift = 0.141 dB

Peak SAR (extrapolated) = 40.6 W/kg

SAR(1 g) = 16.7 mW/g ; SAR(10 g) = 5.6 mW/g

Maximum value of SAR (measured) = 25 mW/g



System Check_Body_5500MHz_120724**DUT: D5GHzV2-SN:1006**

Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: MSL_5G_120724 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.806$ mho/m; $\epsilon_r = 47.837$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.81, 3.81, 3.81); Calibrated: 2012/6/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 39.3 mW/g

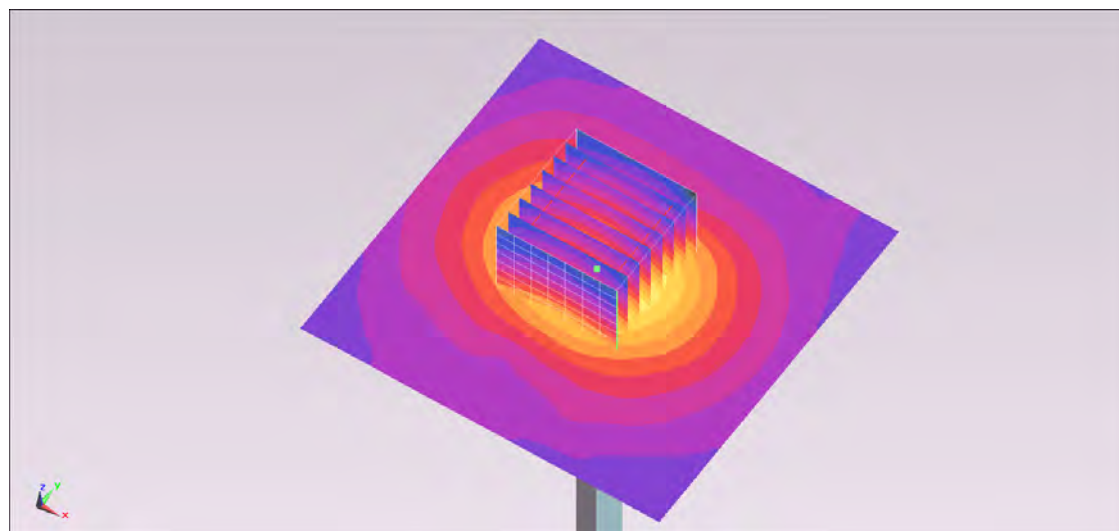
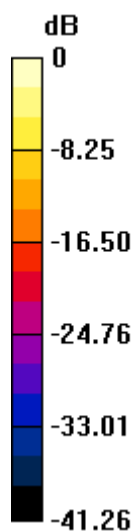
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 83.078 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 65.387 mW/g

SAR(1 g) = 20.1 mW/g; SAR(10 g) = 5.71 mW/g

Maximum value of SAR (measured) = 35.5 mW/g



0 dB = 35.5 mW/g = 31.00 dB mW/g

System Check_Body_5500MHz_120725**DUT: D5GHzV2-SN:1006**

Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: MSL_5G_120725 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.738$ mho/m; $\epsilon_r = 48.597$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.6 °C; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.81, 3.81, 3.81); Calibrated: 2012/6/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 38.8 mW/g

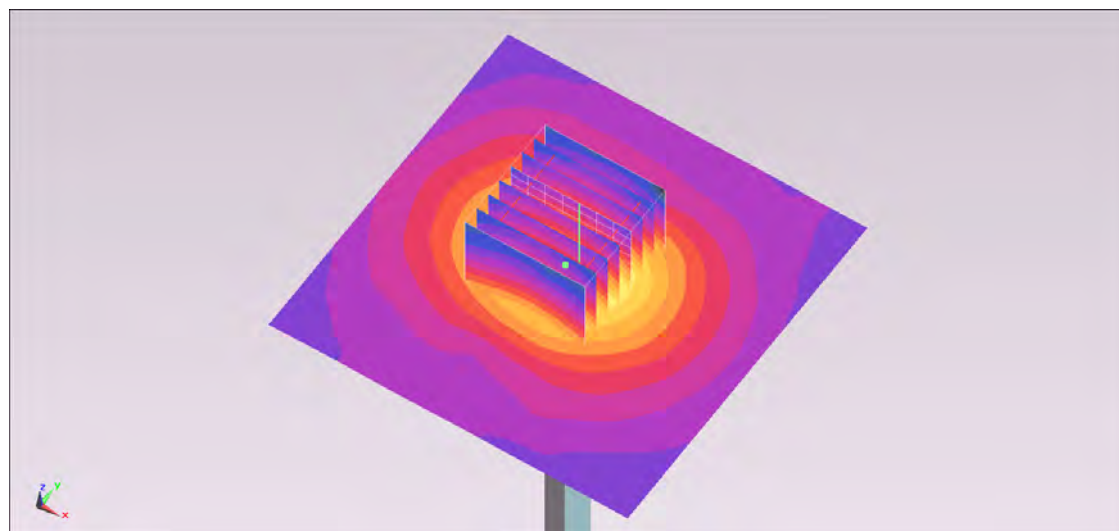
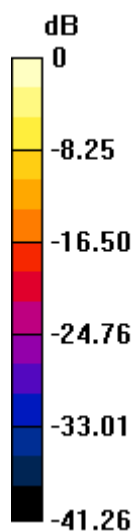
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 83.078 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 64.624 mW/g

SAR(1 g) = 19.9 mW/g; SAR(10 g) = 5.64 mW/g

Maximum value of SAR (measured) = 35.1 mW/g



0 dB = 35.1 mW/g = 30.91 dB mW/g

System Check_Body_5500MHz_120913

DUT: D5GHzV2-SN:1006

Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: MSL_5G_120913 Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 5.74 \text{ mho/m}$; $\epsilon_r = 48.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.81, 3.81, 3.81); Calibrated: 2012/6/21
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 38.8 mW/g

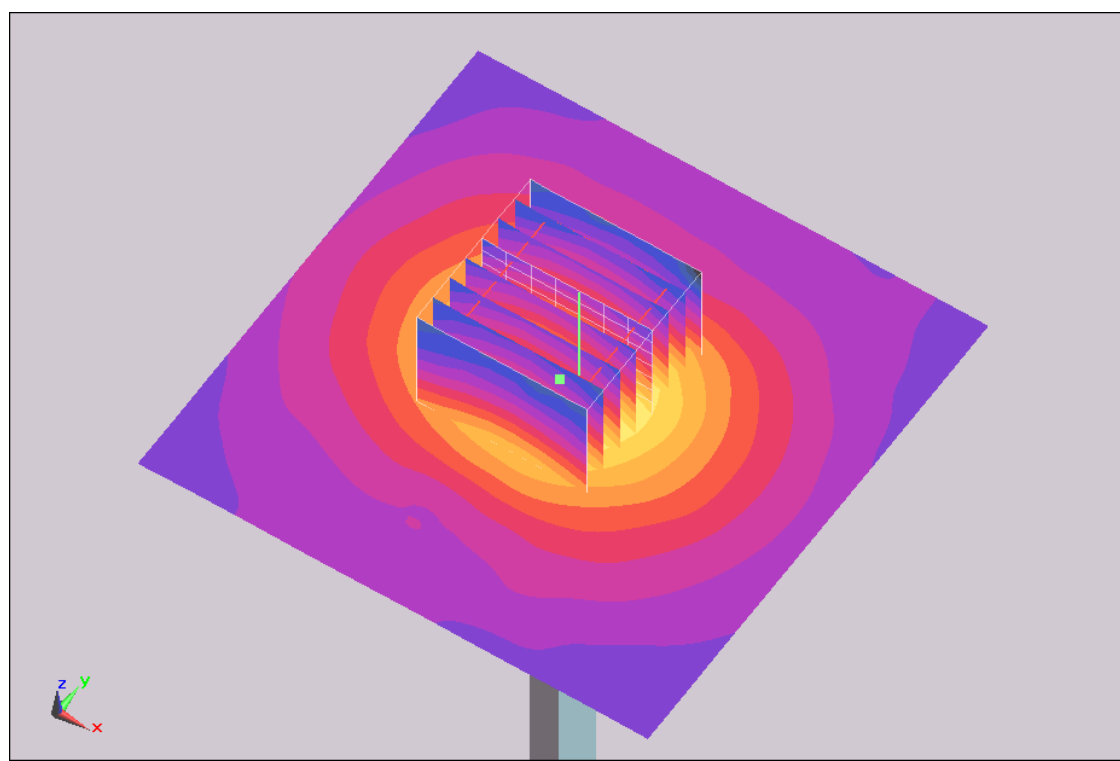
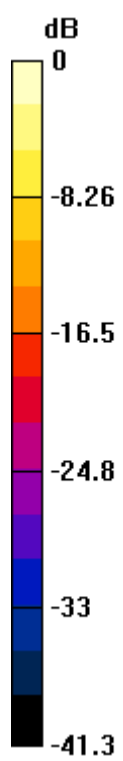
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4.3\text{mm}$, $dy=4.3\text{mm}$, $dz=3\text{mm}$

Reference Value = 83.1 V/m ; Power Drift = 0.086 dB

Peak SAR (extrapolated) = 64.6 W/kg

SAR(1 g) = 19.9 mW/g ; SAR(10 g) = 5.64 mW/g

Maximum value of SAR (measured) = 35.1 mW/g



0 dB = 35.1mW/g

System Check_Body_5500MHz_120914**DUT: D5GHzV2-SN:1006**

Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: MSL_5G_120914 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.587$ mho/m; $\epsilon_r = 47.93$; $\rho =$

1000 kg/m^3

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.81, 3.81, 3.81); Calibrated: 2012/6/21;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 37.8 mW/g

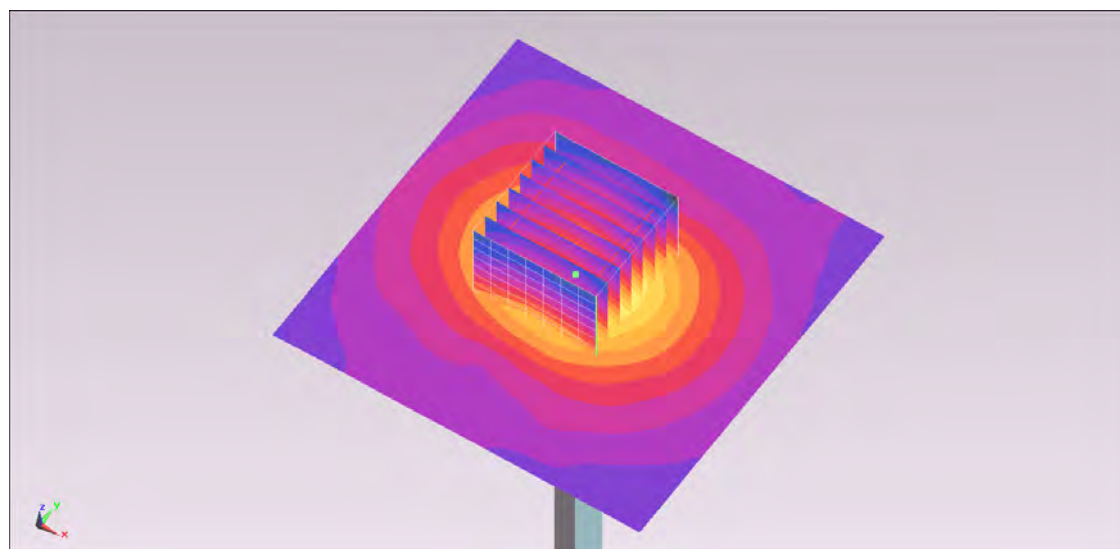
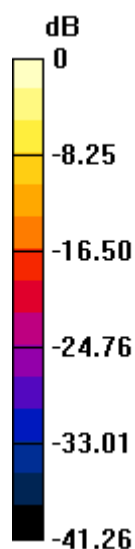
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4.3\text{mm}$, $dy=4.3\text{mm}$, $dz=3\text{mm}$

Reference Value = 83.078 V/m ; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 62.924 mW/g

SAR(1 g) = 19.4 mW/g ; SAR(10 g) = 5.49 mW/g

Maximum value of SAR (measured) = 34.2 mW/g



0 dB = 34.2 mW/g = 30.68 dB mW/g

System Check_Body_5800MHz_120724**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120724 Medium parameters used: $f = 5800$ MHz; $\sigma = 6.219$ mho/m; $\epsilon_r = 47.128$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.89, 3.89, 3.89); Calibrated: 2012/6/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 35.3 mW/g

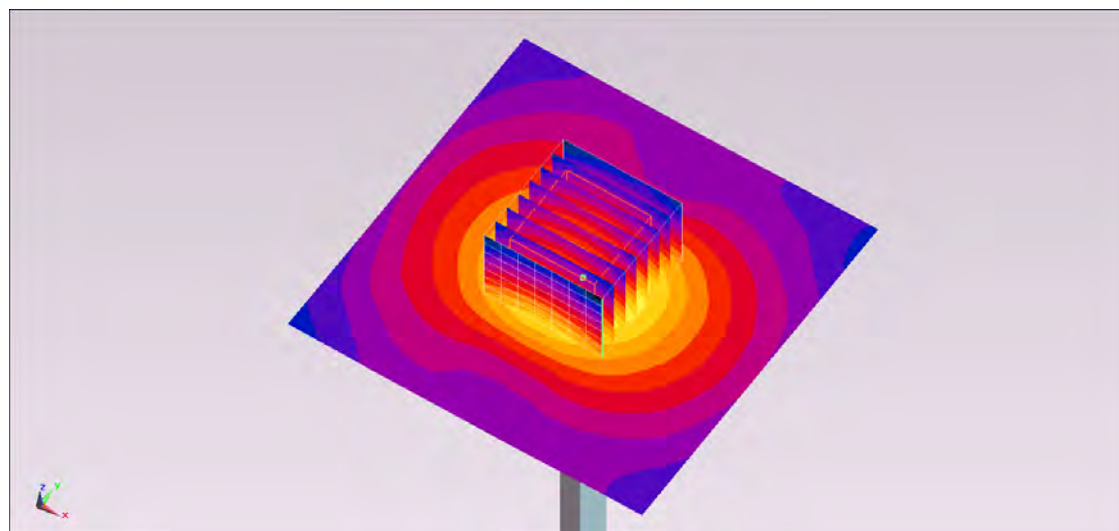
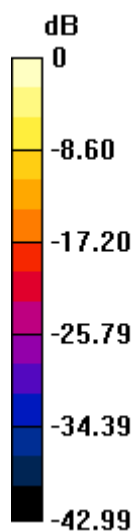
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 81.539 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 56.274 mW/g

SAR(1 g) = 19.2 mW/g; SAR(10 g) = 5.56 mW/g

Maximum value of SAR (measured) = 32.7 mW/g



0 dB = 32.7 mW/g = 30.29 dB mW/g

System Check_Body_5800MHz_120725**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120725 Medium parameters used: $f = 5800$ MHz; $\sigma = 6.127$ mho/m; $\epsilon_r = 47.784$;

$\rho = 1000$ kg/m³

Ambient Temperature : 22.6 °C; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.89, 3.89, 3.89); Calibrated: 2012/6/21;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Software: DASY5 Version; SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 34.8 mW/g

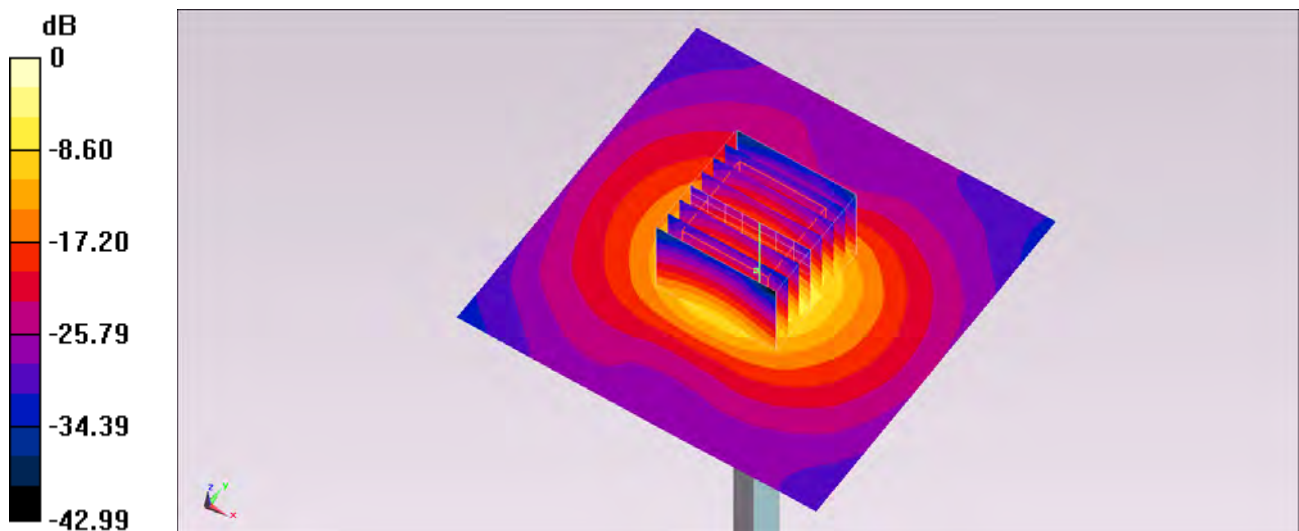
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 81.539 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 55.439 mW/g

SAR(1 g) = 18.9 mW/g; SAR(10 g) = 5.47 mW/g

Maximum value of SAR (measured) = 32.2 mW/g



0 dB = 32.2 mW/g = 30.16 dB mW/g

System Check_Body_5800MHz_120913

DUT: D5GHzV2-SN:1006

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

Medium: MSL_5G_120913 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.13 \text{ mho/m}$; $\epsilon_r = 47.8$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.89, 3.89, 3.89); Calibrated: 2012/6/21
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 34.4 mW/g

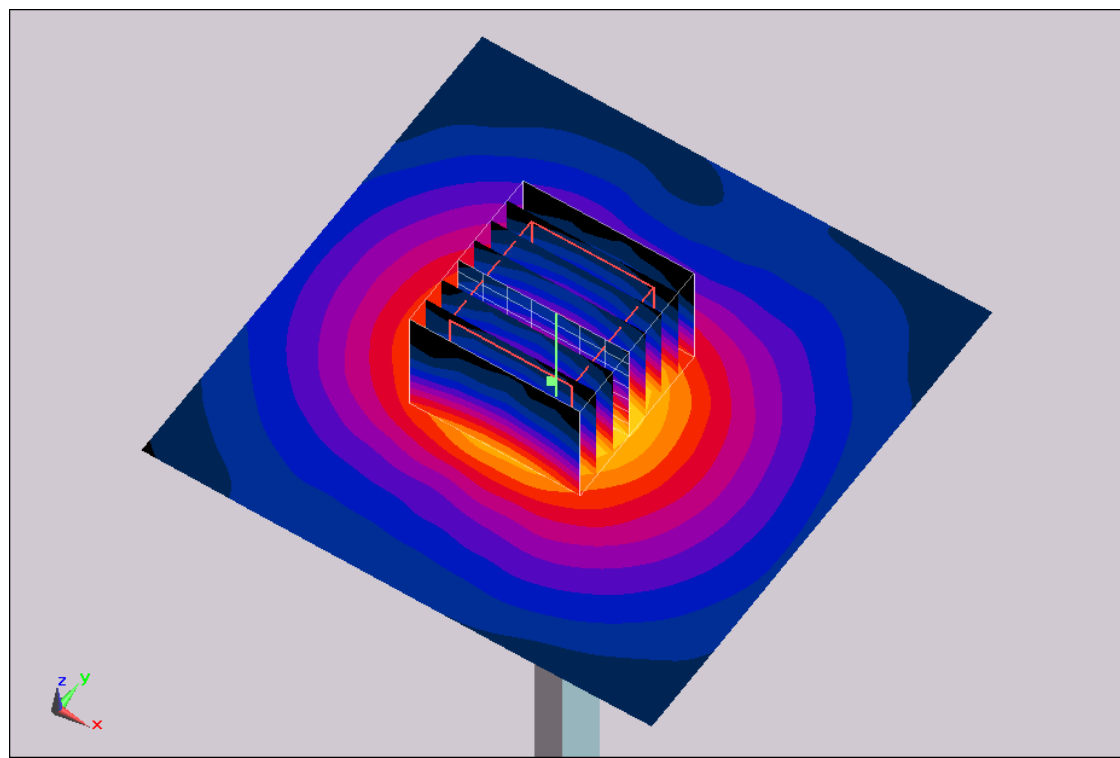
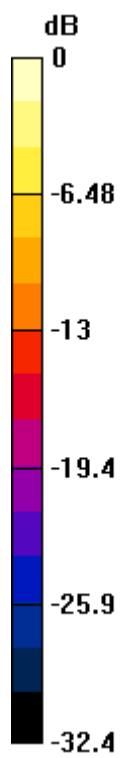
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4.3\text{mm}$, $dy=4.3\text{mm}$, $dz=3\text{mm}$

Reference Value = 81.6 V/m ; Power Drift = 0.166 dB

Peak SAR (extrapolated) = 78.5 W/kg

SAR(1 g) = 19.6 mW/g ; SAR(10 g) = 5.47 mW/g

Maximum value of SAR (measured) = 33.7 mW/g



0 dB = 33.7mW/g

System Check_Body_5800MHz_120915**DUT: D5GHzV2-SN:1006**

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

Medium: MSL_5G_120915 Medium parameters used: $f = 5800$ MHz; $\sigma = 5.976$ mho/m; $\epsilon_r = 47.158$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3792; ConvF(3.89, 3.89, 3.89); Calibrated: 2012/6/21;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 34.0 mW/g

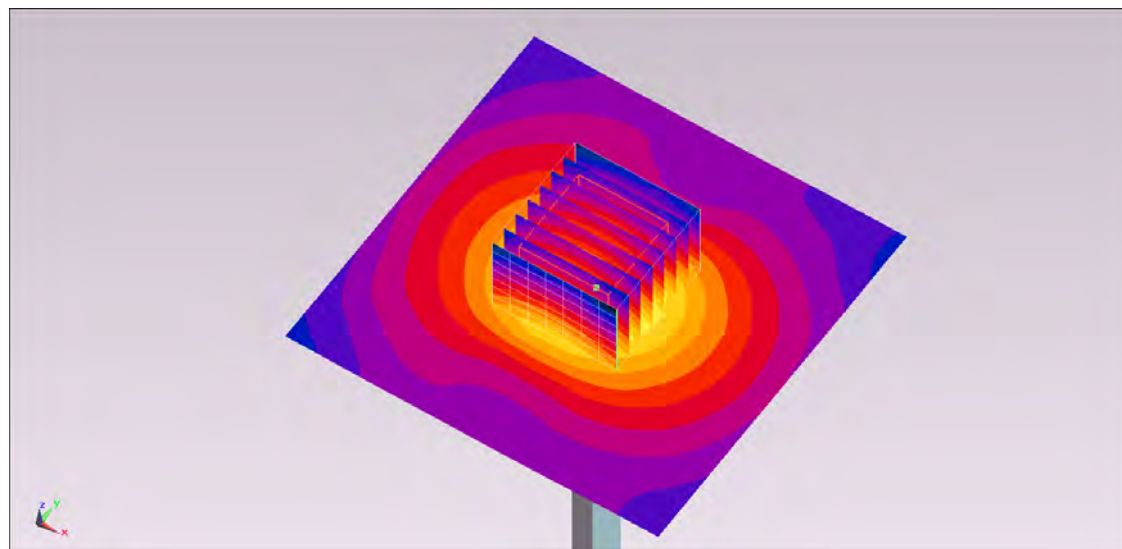
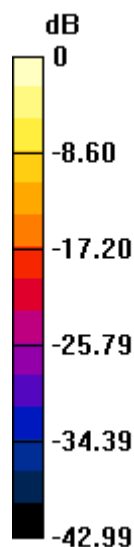
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 81.539 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 54.074 mW/g

SAR(1 g) = 18.5 mW/g; SAR(10 g) = 5.34 mW/g

Maximum value of SAR (measured) = 31.4 mW/g



0 dB = 31.4 mW/g = 29.94 dB mW/g

System Check_Body_5800MHz_120917

DUT: D5GHzV2 - SN:1006

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

Medium: MSL_5G_120917 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.11 \text{ mho/m}$; $\epsilon_r = 47.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3578; ConvF(3.43, 3.43, 3.43); Calibrated: 2012/6/21
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2012/6/12
- Phantom: ELI 4.0_Front; Type: QD 0VA 002 AA; Serial: TP-1131
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 27.2 mW/g

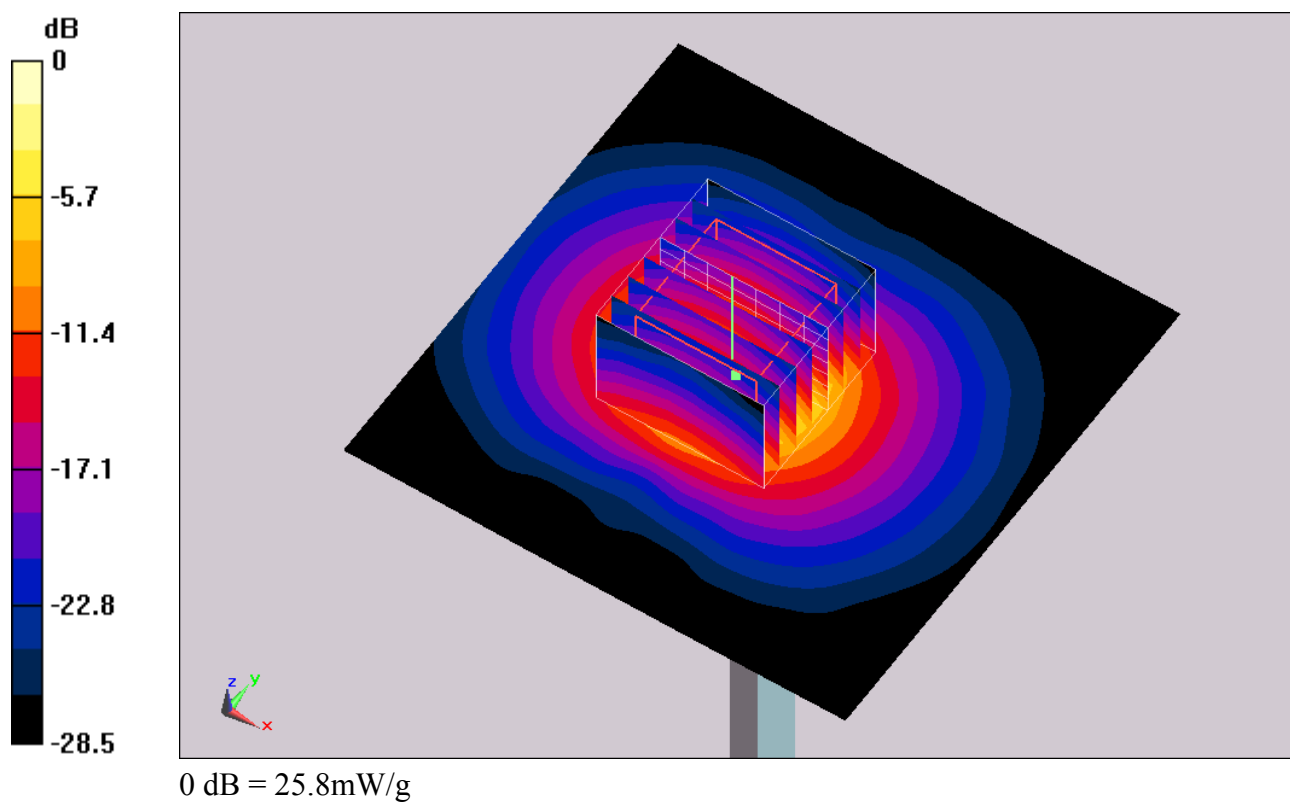
Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4.3\text{mm}$, $dy=4.3\text{mm}$, $dz=3\text{mm}$

Reference Value = 64.7 V/m ; Power Drift = 0.172 dB

Peak SAR (extrapolated) = 42.7 W/kg

SAR(1 g) = 16.9 mW/g ; SAR(10 g) = 5.29 mW/g

Maximum value of SAR (measured) = 25.8 mW/g



Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.