FCC SAR Test Report

APPLICANT	:	Brightstar Corporation
EQUIPMENT	:	Tablet PC
BRAND NAME	:	Avvio
MODEL NAME	:	Avvio PAD 2
MARKETING NAME	:	Avvio PAD 2
FCC ID	:	WVBA1001
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003

The product was testing completed on Feb. 27, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL (SHENZHEN) INC.
No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C.

Table of Contents

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA411703	Rev. 01	Initial issue of report	Feb. 28, 2014

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Brightstar Corporation Tablet PC, Avvio PAD 2** are as follows.

<Highest SAR Summary>

Exposure Position	Frequency Band	Reported 1g-SAR (W/kg)	Equipment Class	Highest Reported 1g-SAR (W/kg)
Head	GPRS850	0.02	PCE	<0.10
	GPRS1900	0.03		
	WCDMA Band V	0.01		
	WCDMA Band II	0.02		
	WLAN 2.4GHz Band	0.35	DTS	0.35
Body	GPRS850	0.89	PCE	1.34
	GPRS1900	1.17		
	WCDMA Band V	0.69		
	WCDMA Band II	1.34		
	WLAN 2.4GHz Band	1.53	DTS	1.53

<Highest Simultaneous transmission SAR>

Exposure Position	Frequency Band	Equipment Class	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
Body	WCDMA Band II	PCE	1.53
	WLAN 2.4GHz Band	DTS	
Body	WCDMA Band II	PCE	1.47
	Bluetooth	DSS	

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003.

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.
Test Site Location	No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755-8637-9589 FAX: +86-755-8637-9595

2.2 Applicant

Company Name	Brightstar Corporation
Address	9725 NW 117th Ave., Miami,Florida, FL 33178, United States

2.3 Manufacturer

Company Name	KCMobile Co., Ltd.
Address	#502, Ace techno tower 8th,191-7 Guro-dong, Guro-Gu, Seoul, South Korea

2.4 Application Details

Date of Start during the Test	Feb. 22, 2014
Date of End during the Test	Feb. 27, 2014

3. General Information

3.1 Description of Equipment Under Test (EUT)

3.2

Product Feature & Specification	
EUT	Tablet PC
Brand Name	Avvio
Model Name	Avvio PAD 2
Marketing Name	Avvio PAD 2
FCC ID	WVBA1001
IMEI Code	358632059900397
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	• GSM/GPRS/EGPRS • RMC/AMR 12.2Kbps Rel 99 • HSDPA Rel 7, Cat14 • HSUPA Rel 6, Cat6 • HSPA+ Rel 7, Cat 14 (Downlink Only) • 802.11b/g/n HT20/HT40 • Bluetooth 3.0+EDR, Bluetooth 4.0
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna
HW Version	M7B-55
SW Version	M7B_APAD2_72_COV01.01
Transfer Mode Category	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Production Unit

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This device has voice function.
3. This device supported VoIP in GPRS/EGPRS, WCDMA (e.g. 3rd part VoIP).
4. This device supports GPRS/EGPRS operation up to class12.

3.3 Maximum RF output power among production units

Burst Average Power (dBm)		
Mode / Band	GSM850	GSM1900
GSM (GMSK, 1 Tx slot)	31.5	29
GPRS (GMSK, 1 Tx slot)	31.5	29
GPRS (GMSK, 2 Tx slots)	29.5	27.5
GPRS (GMSK, 3 Tx slots)	29	26.5
GPRS (GMSK, 4 Tx slots)	27	24.5
EDGE (8PSK, 1 Tx slot)	27	27
EDGE (8PSK, 2 Tx slots)	26	26
EDGE (8PSK, 3 Tx slots)	23.5	24
EDGE (8PSK, 4 Tx slots)	22.5	22.5

Maximum Target Power for Production Unit		
Mode / Band	WCDMA Band V	WCDMA Band II
AMR	22.5	23
RMC 12.2K	22.5	23
HSDPA Subtest-1	21.5	22.5
HSDPA Subtest-2	21.5	22.5
HSDPA Subtest-3	21	22
HSDPA Subtest-4	21	22
HSUPA Subtest-1	21	21
HSUPA Subtest-2	19	20
HSUPA Subtest-3	20	20.5
HSUPA Subtest-4	19	20
HSUPA Subtest-5	21	21

Average Power (dBm)				
Mode / Band	IEEE 802.11b/g/n			
	11b	11g	11n-HT20	11n-HT40
WLAN 2.4GHz Band	13	14	13.5	13

Average Power (dBm)				
Mode / Band	1Mbps (GFSK)	2Mbps (π/4-DQPSK)	3Mbps (8-DPSK)	BT4.0 LE (GFSK)
Bluetooth	4	2.5	2.5	-0.5

3.4 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 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 248227 D01 SAR meas for 802 11abg v01r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r01
- FCC KDB 941225 D01 SAR test for 3G devices v02
- FCC KDB 941225 D02 HSPA and 1x Advanced v02r02
- FCC KDB 941225 D03 SAR Test Reduction GSM GPRS EDGE v01

3.5 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 for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

3.6 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 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.

During WLAN SAR testing EUT is configured with the WLAN continuous TX tool, and the transmission duty factor was monitored on the spectrum analyzer with zero-span setting

Duty factor observed as below:

802.11b, 1Mbps: 98.27%

802.11g, 6Mbps: 89.17%

802.11n-HT20, MCS0: 89.04%

802.11n-HT40, MCS0,: 78.92%

For WLAN SAR testing, WLAN engineering testing software installed on the EUT can provide continuous transmitting RF signal.

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:

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

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

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

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

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

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

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

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

5. SAR Measurement System

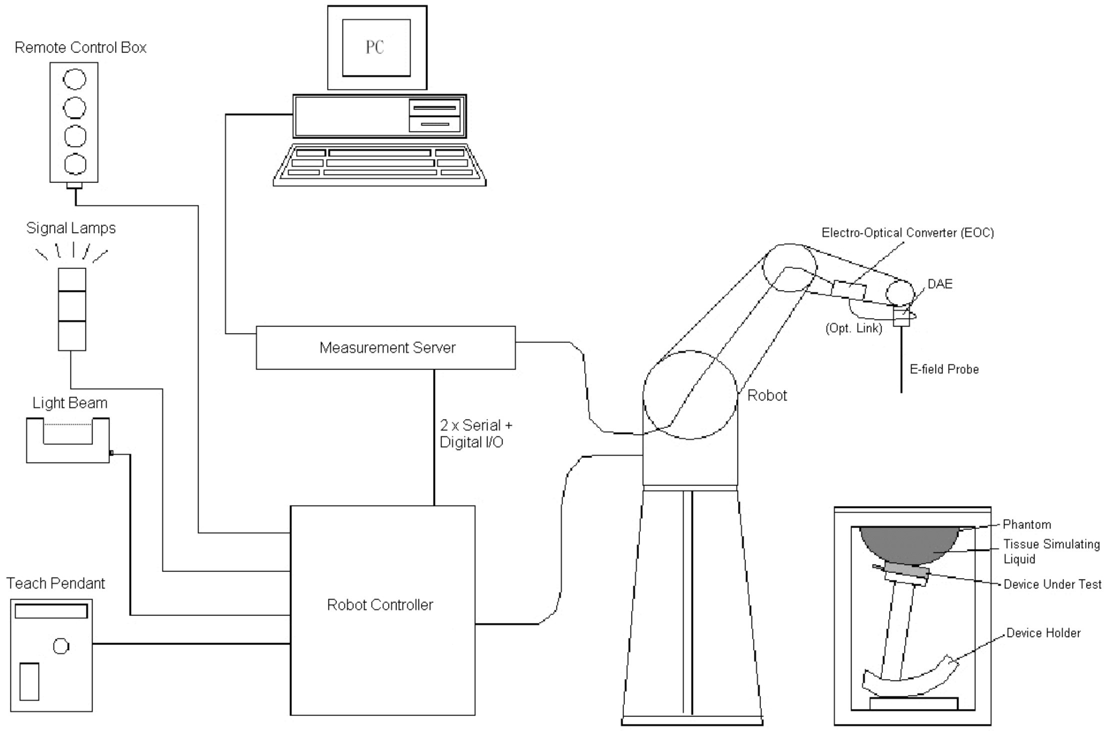


Fig 5.1 SPEAG DASY System Configurations

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
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Component details are described in 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 frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

5.1.1 E-Field Probe Specification

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/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

Fig 5.2 Photo of EX3DV4

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy shall be evaluated and within ± 0.25dB. 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 5.3 Photo of DAE

5.3

5.4 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (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 5.4 Photo of DASY5

5.5 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128 MB), RAM (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 5.5 Photo of Server for DASY5

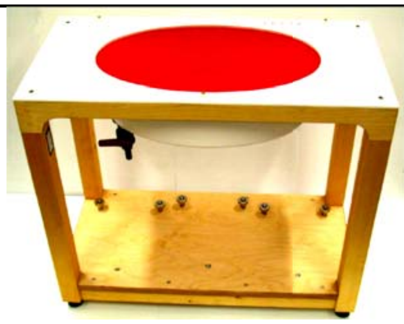
5.6 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	 **Fig 5.6 Photo of SAM Phantom**
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat 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%)	 **Fig 5.7 Photo of ELI4 Phantom**
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

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.

5.7 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 ε = 3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Fig 5.8 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.

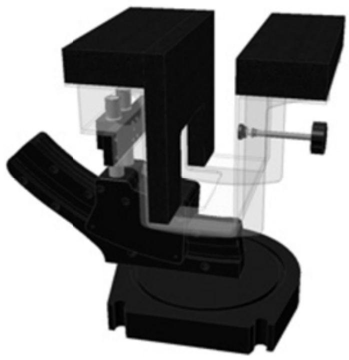


Fig 5.9 Laptop Extension Kit

5.8 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：

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

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：

E-field Probes：$\mathbf{E_i} = \sqrt{\frac{\mathbf{V_i}}{\mathbf{Norm_i \cdot ConvF}}}$

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

with V$_i$ = compensated signal of channel i, (i = x, y, z)
Norm$_i$ = sensor sensitivity of channel i, (i = x, y, z), μV/(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)：

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

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

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

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.

5.9 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 18, 2011	Nov. 14, 2014
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2011	Nov. 14, 2014
SPEAG	2450MHz System Validation Kit	D2450V2	840	Mar. 26, 2013	Mar. 25, 2014
SPEAG	Data Acquisition Electronics	DAE4	1303	Nov. 22, 2013	Nov. 21, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Nov. 27, 2013	Nov. 26, 2014
SPEAG	SAM Twin Phantom	QD 000 P40 CD	TP-1670	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CD	TP-1671	NCR	NCR
SPEAG	ELI4 Phantom	QD OVA 002 AA	1149	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Agilent	Wireless Communication Test Set	E5515C	MY50267224	Oct. 10, 2013	Oct. 09, 2014
R&S	Network Analyzer	ZVB8	100106	Nov. 07, 2013	Nov. 06, 2014
Speag	Dielectric Assessment KIT	DAK-3.5	1032	NCR	NCR
Anritsu	Power Meter	ML2495A	1218010	Mar. 28. 2013	Mar. 27, 2014
Anritsu	Power Sensor	MA2411B	1207253	Mar. 28. 2013	Mar. 27, 2014
Agilent	Dual Directional Coupler	778D	50422	Note 4	
Woken	Attenuator 1	WK0602-XX	N/A	Note 4	
PE	Attenuator 2	PE7005-10	N/A	Note 4	
PE	Attenuator 3	PE7005- 3	N/A	Note 4	
AR	Power Amplifier	5S1G4M2	328767	Note 5	
R&S	Spectrum Analyzer	FSP7	101230	Jun. 13, 2013	Jun. 12, 2014

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 865664 D01v01r03, 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 D835V2, SN: 4d091, D1900V2, SN: 5d118, 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.
4. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
5. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1W input power according to the ratio of 1W to the input power to the dipole. For system check, the calibration of the power amplifier is deemed not critically required for correct measurement; the power meter is critical and we do have calibration for it
6. Attenuator 1 insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.

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.

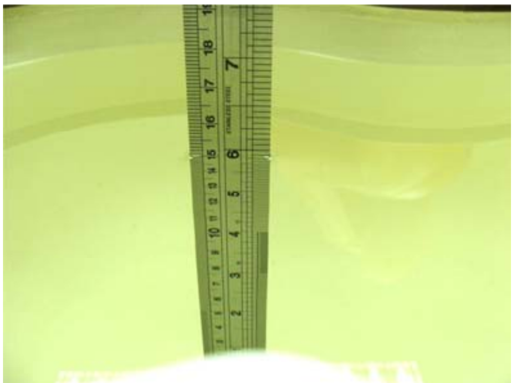


Fig 6.1 Photo of Liquid Height for Head SAR

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								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an SPEAG DAK-3.5 Dielectric Probe Kit and an R&S Network Analyzer.

The following table shows the measuring results for simulating liquid.

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	22.8	0.897	40.781	0.90	41.50	-0.33	-1.73	±5	Feb. 27, 2014
1900	Head	22.6	1.417	40.994	1.40	40.00	1.21	2.49	±5	Feb. 27, 2014
2450	Head	22.7	1.823	37.961	1.80	39.20	1.28	-3.16	±5	Feb. 27, 2014
835	Body	22.6	1.011	56.243	0.97	55.20	4.23	1.89	±5	Feb. 22, 2014
1900	Body	22.7	1.533	54.611	1.52	53.30	0.86	2.46	±5	Feb. 22, 2014
2450	Body	22.8	1.949	51.667	1.95	52.70	-0.05	-1.96	±5	Feb. 24, 2014

Table 6.2 Measuring Results for Simulating Liquid

7. System Verification Procedures

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:

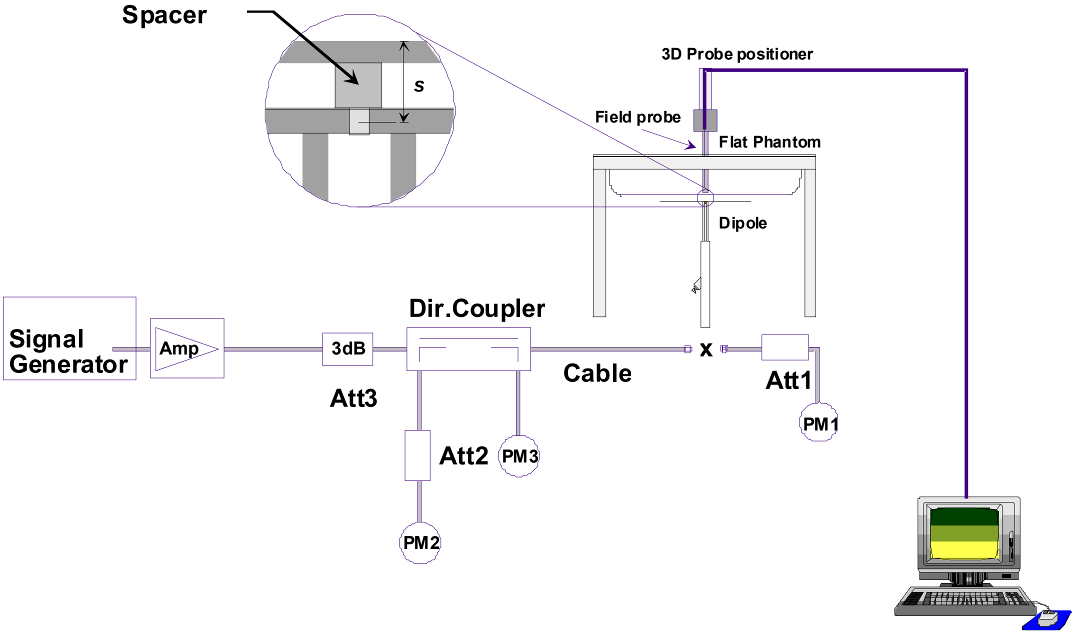


Fig 7.1 System Setup for System Evaluation

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

Fig 7.2 Photo of Dipole Setup

7.3 SAR System Verification Results

Comparing to the original SAR value provided by SPEAG, the verification 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.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured SAR (W/kg)	Targeted SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
Feb. 27, 2014	835	Head	250	4d091	3819	1303	2.43	9.40	9.72	3.40
Feb. 27, 2014	1900	Head	250	5d118	3819	1303	9.75	40.30	39	-3.23
Feb. 27, 2014	2450	Head	250	840	3819	1303	12.52	53.60	50.08	-6.57
Feb. 22, 2014	835	Body	250	4d091	3819	1303	2.27	9.42	9.08	-3.61
Feb. 22, 2014	1900	Body	250	5d118	3819	1303	9.91	41.80	39.64	-5.17
Feb. 24, 2014	2450	Body	250	840	3819	1303	13.50	50.40	54	7.14

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

This EUT was tested in eleven different positions. They are Right Cheek, Right Tilted, Left Cheek, Left Tilted, bottom-face, Edge1, Edge2, Edge3, Edge4, Curved surface of Edge1 and Curved surface of Edge3. In these positions, the surface of EUT is touching with phantom 0cm. Please refer to Appendix D for the test setup photos.

8.1 SAR Testing for Tablet

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

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area & 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 is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r03 quoted below.

When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

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

9.4 Volume Scan Procedures

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

9.5 SAR Averaged Methods

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

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

9.6 Power Drift Monitoring

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

10. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

Note:

1. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. The EUT do not support DTM function.
3. According to October 2013TCB Workshop, for GSM / GPRS, the number of time slots to test for SAR should correspond to the highest source-based time-averaged maximum output power configuration; When time slots with equivalent maximum average output power specifications, including tolerance, if the measured maximum output power levels are within 0.25 dB of each other, test the configuration with the most number of time slots.
4. For head and Body worn SAR testing, the EUT was set in GPRS 3 Tx slots for GSM850/GSM1900 band due to its highest frame-average power.

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM (GMSK, 1 Tx slot)	**31.22**	31.17	31.08	31.5	22.22	22.17	22.08	22.5
GPRS (GMSK, 1 Tx slot)	31.21	31.16	31.07	31.5	22.21	22.16	22.07	22.5
GPRS (GMSK, 2 Tx slots)	29.48	29.33	29.23	29.5	23.48	23.33	23.23	23.5
GPRS (GMSK, 3 Tx slots)	28.69	28.63	28.54	29	**24.43**	24.37	24.28	24.74
GPRS (GMSK, 4 Tx slots)	26.73	26.66	26.56	27	23.73	23.66	23.56	24
EDGE (8PSK, 1 Tx slot)	26.63	26.61	26.63	27	17.63	17.61	17.63	18
EDGE (8PSK, 2 Tx slots)	25.56	25.49	25.57	26	19.56	19.49	19.57	20
EDGE (8PSK, 3 Tx slots)	23.25	23.22	23.22	23.5	18.99	18.96	18.96	19.24
EDGE (8PSK, 4 Tx slots)	22.10	22.09	22.08	22.5	19.10	19.09	19.08	19.5
Band GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM (GMSK, 1 Tx slot)	28.64	**28.73**	28.72	29	19.64	19.73	19.72	20
GPRS (GMSK, 1 Tx slot)	28.62	28.72	28.71	29	19.62	19.72	19.71	20
GPRS (GMSK, 2 Tx slots)	26.72	26.88	26.87	27.5	20.72	20.88	20.87	21.5
GPRS (GMSK, 3 Tx slots)	25.89	26.01	25.99	26.5	21.63	**21.75**	21.73	22.24
GPRS (GMSK, 4 Tx slots)	23.96	24.06	24.10	24.5	20.96	21.06	21.10	21.5
EDGE (8PSK, 1 Tx slot)	26.57	25.97	25.32	27	17.57	16.97	16.32	18
EDGE (8PSK, 2 Tx slots)	25.51	24.84	24.17	26	19.51	18.84	18.17	20
EDGE (8PSK, 3 Tx slots)	23.43	22.76	22.08	24	19.17	18.50	17.82	19.74
EDGE (8PSK, 4 Tx slots)	22.22	21.55	20.81	22.5	19.22	18.55	17.81	19.5

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

<WCDMA Conducted Power>

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

<WCDMA Conducted Power>

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. By design, HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps, detailed information is included in Tune-up Procure exhibit.
3. 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 tune-up procedure exhibit.
4. Per KDB 941225 D02v02r02, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA / HSUPA output power is < 0.25dB higher than RMC, or reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA / HSUPA SAR evaluation can be excluded.

Band		WCDMA Band V				WCDMA Band II			
Tx Channel		4132	4182	4233	Tune-up Limit (dBm)	9262	9400	9538	Tune-up Limit (dBm)
Rx Channel		4357	4407	4458		9662	9800	9938	
Frequency (MHz)		826.4	836.4	846.6		1852.4	1880	1907.6	
3GPP Rel 99	AMR	21.87	21.68	21.80	22.5	22.86	22.57	22.47	23
3GPP Rel 99	RMC 12.2Kbps	**21.89**	21.69	21.81	22.5	**22.87**	22.58	22.50	23
3GPP Rel 6	HSDPA Subtest-1	20.91	20.74	20.73	21.5	21.87	21.64	21.55	22.50
3GPP Rel 6	HSDPA Subtest-2	20.89	20.74	20.74	21.5	21.86	21.65	21.55	22.50
3GPP Rel 6	HSDPA Subtest-3	20.44	20.26	20.29	21	21.37	21.20	21.09	22
3GPP Rel 6	HSDPA Subtest-4	20.41	20.24	20.26	21	21.35	21.15	21.07	22
3GPP Rel 6	HSUPA Subtest-1	19.43	19.25	19.25	21	20.29	20.04	19.93	21
3GPP Rel 6	HSUPA Subtest-2	18.40	18.26	18.29	19	19.32	19.16	19.08	20
3GPP Rel 6	HSUPA Subtest-3	19.41	19.26	19.26	20	20.29	20.06	19.97	20.5
3GPP Rel 6	HSUPA Subtest-4	18.92	18.75	18.73	19	19.88	19.66	19.56	20
3GPP Rel 6	HSUPA Subtest-5	20.33	20.17	20.18	21	20.50	20.29	20.19	21
3GPP MPR specification	MPR result	WCDMA Band V			MPR Target	WCDMA Band II			MPR Target
0	HSDPA Subtest-1	0.00	0.00	0.00	0	0.00	0.00	0.00	0
0	HSDPA Subtest-2	0.02	0.00	-0.01	0	0.01	-0.01	0.00	0
≦0.5	HSDPA Subtest-3	0.47	0.48	0.44	0.5	0.50	0.44	0.46	0.5
≦0.5	HSDPA Subtest-4	0.50	0.50	0.47	0.5	0.52	0.49	0.48	0.5
≦0	HSUPA Subtest-1	0.90	0.92	0.93	0	0.21	0.25	0.26	0
≦2	HSUPA Subtest-2	1.93	1.91	1.89	2	1.18	1.13	1.11	2
≦1	HSUPA Subtest-3	0.92	0.91	0.92	1	0.21	0.23	0.22	1
≦2	HSUPA Subtest-4	1.41	1.42	1.45	2	0.62	0.63	0.63	2
≦0	HSUPA Subtest-5	0.00	0.00	0.00	0	0.00	0.00	0.00	0

<WLAN 2.4GHz Conducted Power>

WLAN 2.4GHz Band 802.11b Average Power (dBm)					
Channel	Frequency (MHz)	Data Rate (bps)			
		1M	2M	5.5M	11M
CH 01	2412	12.39	12.10	12.18	12.16
CH 06	2437	12.17	11.88	11.96	11.94
CH 11	2462	12.68	12.39	12.47	12.45

WLAN 2.4GHz Band 802.11g Average Power (dBm)									
Channel	Frequency (MHz)	Data Rate (bps)							
		6M	9M	12M	18M	24M	36M	48M	54M
CH 01	2412	13.35	13.33	13.32	13.26	13.30	13.32	13.32	13.31
CH 06	2437	13.52	13.50	13.49	13.43	13.47	13.49	13.49	13.48
CH 11	2462	13.94	13.92	13.91	13.85	13.89	13.91	13.91	13.90

WLAN 2.4GHz Band 802.11n (HT 20) Average Power (dBm)									
Channel	Frequency (MHz)	MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	12.26	12.23	12.21	12.23	12.20	12.23	12.22	12.17
CH 06	2437	12.48	12.45	12.43	12.45	12.42	12.45	12.44	12.39
CH 11	2462	13.02	12.99	12.97	12.99	12.96	12.99	12.98	12.93

WLAN 2.4GHz Band 802.11n (HT 40) Average Power (dBm)									
Channel	Frequency (MHz)	MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	12.18	12.03	12.01	12.05	12.02	12.00	12.01	12.00
CH 06	2437	12.34	12.19	12.17	12.21	12.18	12.16	12.17	12.16
CH 09	2452	12.57	12.42	12.40	12.44	12.41	12.39	12.40	12.39

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. 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 1/4dB higher than those measured at the lowest data rate
3. Per KDB 248227 D01 v01r02, 11g and 11n-HT20 average output power is higher than 1/4dB higher than 11b mode, these modes SAR will be verified at the highest RF exposure position found in 802.11b SAR testing.

Bluetooth average power (dBm)				
Mode	1Mbps (GFSK)	2Mbps (π/4-DQPSK)	3Mbps (8-DPSK)	BT4.0 LE (GFSK)
Tune Up Limit	4	2.5	2.5	-0.5

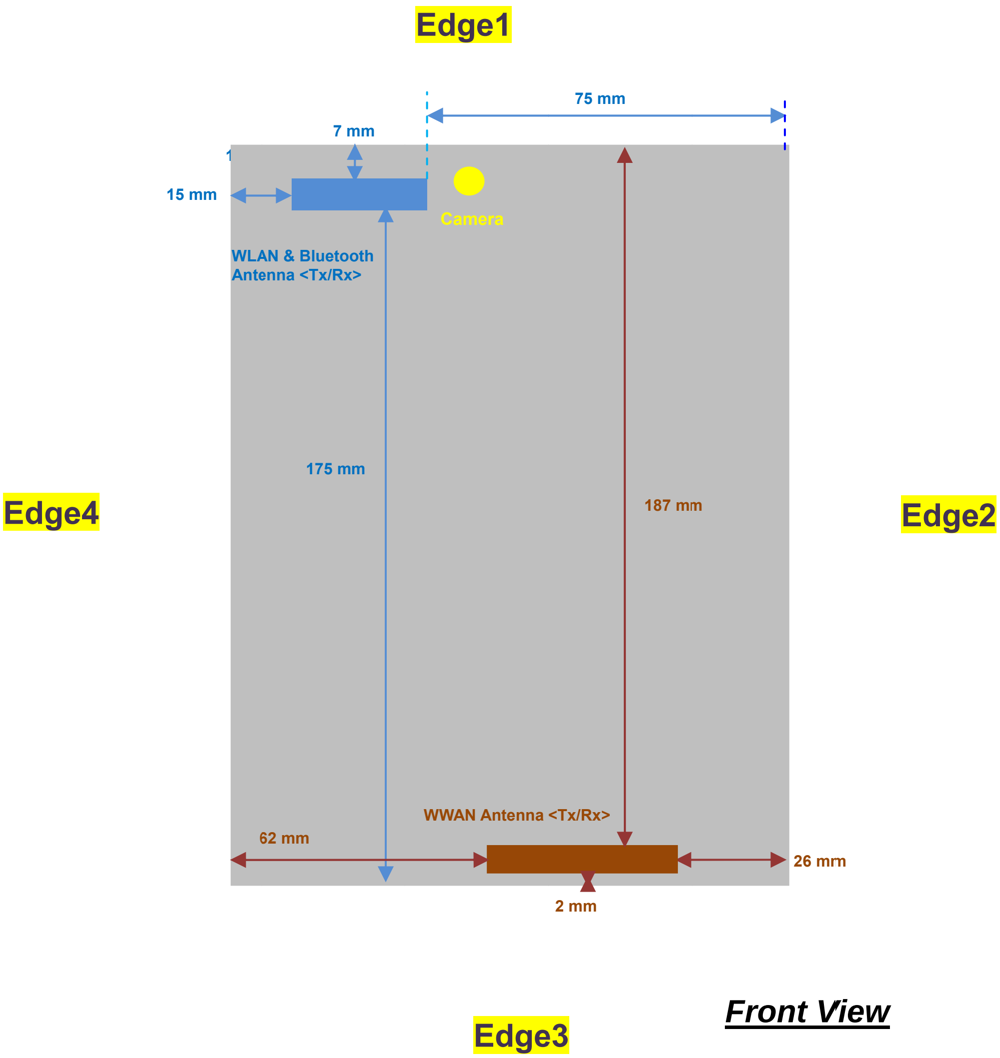
Note:

1. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
   - If the distance of the antenna to the user is < 5mm, 5mm is used to determine SAR exclusion threshold

Bluetooth Max Power (dBm)	mW	Test Distance (mm)	Frequency (GHz)	exclusion thresholds
4	3.00	0	2.48	0.31

Per KDB 447498 D01v05r02 exclusion thresholds is 0.31 < 3, RF exposure evaluation is not required.

11. Antenna Location



Antennas	Wireless Interface
WWAN Main Antenna (Tx / Rx)	GSM850 GSM1900 WCDMA Band V WCDMA Band II
BT&WLAN Antenna (Tx / Rx)	WLAN 2.4GHz Bluetooth

SAR test exclusion table distance is ≤ 50mm

Exposure Position	Wireless Interface	GPRS850 3 Tx slots	GPRS1900 3 Tx slots	WCDMA Band V	WCDMA Band II	802.11b
	Tune-up Maximum power (dBm)	24.74	22.24	22.5	23	13
Bottom Face	Antenna to user (mm)	5				5
	SAR exclusion threshold	55	46	33	55	6
	SAR testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Edge 1	Antenna to user (mm)					7
	SAR exclusion threshold					4
	SAR testing required?					**Yes**
Edge 2	Antenna to user (mm)	26				
	SAR exclusion threshold	11	9	6	11	
	SAR testing required?	**Yes**	**Yes**	**Yes**	**Yes**	
Edge 3	Antenna to user (mm)	2				
	SAR exclusion threshold	55	46	33	55	
	SAR testing required?	**Yes**	**Yes**	**Yes**	**Yes**	
Edge 4	Antenna to user (mm)					15
	SAR exclusion threshold					2
	SAR testing required?					No

SAR test exclusion table distance is > 50mm

Exposure Position	Wireless Interface	GPRS850 3 Tx slots	GPRS1900 3 Tx slots	WCDMA Band V	WCDMA Band II	802.11b
	Tune-up Maximum power (dBm)	24.74	22.24	22.5	23	13
	Tune-up Maximum rated power (mW)	298	167	178	200	20
Edge 1	Antenna to user (mm)	187				
	SAR exclusion threshold (mW)	937	1479	936	1479	
	SAR testing required?	No	No	No	No	
Edge 2	Antenna to user (mm)					75
	SAR exclusion threshold (mW)					346
	SAR testing required?					No
Edge 3	Antenna to user (mm)					175
	SAR exclusion threshold (mW)					1346
	SAR testing required?					No
Edge 4	Antenna to user (mm)	62				
	SAR exclusion threshold (mW)	231	229	231	229	
	SAR testing required?	**Yes**	No	No	No	

Note:
1. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
2. Per KDB 447498 D01v05r02, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D01v05r02, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
4. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison

- For < 50 mm distance, we just calculate mW of the exclusion threshold value (3.0) to do compare. This formula is [3.0] / [$\sqrt{f(GHz)}$] ·[(*min. test separation distance, mm*)] = exclusion threshold of mW.

5. Per KDB 447498 D01v05r02, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

12. SAR Test Results

Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v05r02, for each exposure position, if the highest output channel reported SAR ≤0.8W/kg, other channels SAR testing is not necessary.
3. According to October 2013TCB Workshop, for GSM / GPRS, the number of time slots to test for SAR should correspond to the highest source-based time-averaged maximum output power configuration; When time slots with equivalent maximum average output power specifications, including tolerance, if the measured maximum output power levels are within 0.25 dB of each other, test the configuration with the most number of time slots.
4. Considering the curvature transition from bottom face to the edge, SAR testing at the curvature was performed. Per KDB 616217 D04v01r01, only wireless interfaces which SAR level at standard edge position >1.2w/kg, are chosen to test SAR at the curved surface, more detail information please refer to the setup photo.

12.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
61	GSM850	GPRS (3 Tx slots)	Right Cheek	128	824.2	28.69	29	1.074	-0.07	0.00585	0.006
62	GSM850	GPRS (3 Tx slots)	Right Tilted	128	824.2	28.69	29	1.074	-0.02	0.011	0.012
63	**GSM850**	**GPRS (3 Tx slots)**	**Left Cheek**	**128**	**824.2**	**28.69**	**29**	**1.074**	**-0.1**	**0.016**	**0.017**
64	GSM850	GPRS (3 Tx slots)	Left Tilted	128	824.2	28.69	29	1.074	-0.01	0.011	0.012
81	**GSM1900**	**GPRS (3 Tx slots)**	**Right Cheek**	**661**	**1880**	**26.01**	**26.5**	**1.119**	**0.02**	**0.025**	**0.028**
82	GSM1900	GPRS (3 Tx slots)	Right Tilted	661	1880	26.01	26.5	1.119	0.02	0.011	0.012
83	GSM1900	GPRS (3 Tx slots)	Left Cheek	661	1880	26.01	26.5	1.119	-0.1	0.018	0.020
84	GSM1900	GPRS (3 Tx slots)	Left Tilted	661	1880	26.01	26.5	1.119	-0.07	0.00984	0.011

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
71	WCDMA Band V	RMC12.2K	Right Cheek	4132	826.4	21.89	22.5	1.151	0.03	0.00813	0.009
72	WCDMA Band V	RMC12.2K	Right Tilted	4132	826.4	21.89	22.5	1.151	-0.05	0.00905	0.010
73	**WCDMA Band V**	**RMC12.2K**	**Left Cheek**	**4132**	**826.4**	**21.89**	**22.5**	**1.151**	**-0.08**	**0.011**	**0.013**
74	WCDMA Band V	RMC12.2K	Left Tilted	4132	826.4	21.89	22.5	1.151	-0.04	0.00768	0.009
91	**WCDMA Band II**	**RMC 12.2K**	**Right Cheek**	**9262**	**1852.4**	**22.87**	**23**	**1.030**	**-0.07**	**0.021**	**0.022**
92	WCDMA Band II	RMC 12.2K	Right Tilted	9262	1852.4	22.87	23	1.030	0.09	0.012	0.012
93	WCDMA Band II	RMC 12.2K	Left Cheek	9262	1852.4	22.87	23	1.030	-0.04	0.019	0.020
94	WCDMA Band II	RMC 12.2K	Left Tilted	9262	1852.4	22.87	23	1.030	-0.08	0.011	0.011

<WLAN2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
101	WLAN 2.4GHz	802.11b	Right Cheek	11	2462	12.68	13	1.076	1.000	0.02	0.259	0.279
102	WLAN 2.4GHz	802.11b	Right Tilted	11	2462	12.68	13	1.076	1.000	0.06	0.201	0.216
103	WLAN 2.4GHz	802.11b	Left Cheek	11	2462	12.68	13	1.076	1.000	0.09	0.143	0.154
104	WLAN 2.4GHz	802.11b	Left Tilted	11	2462	12.68	13	1.076	1.000	0.02	0.115	0.124
105	**WLAN 2.4GHz**	**802.11g**	**Right Cheek**	**11**	**2462**	**13.94**	**14**	**1.014**	**1.121**	**-0.06**	**0.304**	**0.346**
106	WLAN 2.4GHz	802.11n-HT20	Right Cheek	11	2462	13.02	13.5	1.116	1.123	-0.05	0.238	0.298

12.2 Body SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
21	GSM850	GPRS (3 Tx slots)	Bottom Face	0	128	824.2	28.69	29	1.074	0.06	0.774	0.831
22	GSM850	GPRS (3 Tx slots)	Edge 2	0	128	824.2	28.69	29	1.074	-0.01	0.030	0.032
23	GSM850	GPRS (3 Tx slots)	Edge 3	0	128	824.2	28.69	29	1.074	0.02	0.269	0.289
24	GSM850	GPRS (3 Tx slots)	Edge 4	0	128	824.2	28.69	29	1.074	-0.01	0.017	0.018
25	GSM850	GPRS (3 Tx slots)	Bottom Face	0	189	836.4	28.63	29	1.089	-0.02	0.809	0.881
26	**GSM850**	**GPRS (3 Tx slots)**	**Bottom Face**	**0**	**251**	**848.8**	**28.54**	**29**	**1.112**	**0.07**	**0.797**	**0.886**
1	GSM1900	GPRS (3 Tx slots)	Bottom Face	0	661	1880	26.01	26.5	1.119	-0.09	0.971	1.087
2	GSM1900	GPRS (3 Tx slots)	Edge 2	0	661	1880	26.01	26.5	1.119	-0.01	0.103	0.115
3	GSM1900	GPRS (3 Tx slots)	Edge 3	0	661	1880	26.01	26.5	1.119	0.09	0.371	0.415
5	GSM1900	GPRS (3 Tx slots)	Bottom Face	0	512	1850.2	25.89	26.5	1.151	0.06	0.874	1.006
6	**GSM1900**	**GPRS (3 Tx slots)**	**Bottom Face**	**0**	**810**	**1909.8**	**25.99**	**26.5**	**1.125**	**0.09**	**1.040**	**1.170**

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
31	**WCDMA Band V**	**RMC12.2K**	**Bottom Face**	**0**	**4132**	**826.4**	**21.89**	**22.5**	**1.151**	**0.03**	**0.595**	**0.685**
32	WCDMA Band V	RMC12.2K	Edge 2	0	4132	826.4	21.89	22.5	1.151	-0.08	0.024	0.028
33	WCDMA Band V	RMC12.2K	Edge 3	0	4132	826.4	21.89	22.5	1.151	0.02	0.188	0.216
11	WCDMA Band II	RMC12.2K	Bottom Face	0	9262	1852.4	22.87	23	1.030	-0.09	1.070	1.103
12	WCDMA Band II	RMC12.2K	Edge 2	0	9262	1852.4	22.87	23	1.030	-0.07	0.129	0.133
13	WCDMA Band II	RMC12.2K	Edge 3	0	9262	1852.4	22.87	23	1.030	-0.06	0.489	0.504
15	**WCDMA Band II**	**RMC12.2K**	**Bottom Face**	**0**	**9400**	**1880**	**22.58**	**23**	**1.102**	**0.1**	**1.220**	**1.344**
16	WCDMA Band II	RMC12.2K	Bottom Face	0	9538	1907.6	22.5	23	1.122	0.03	1.140	1.279
18	WCDMA Band II	RMC12.2K	Curved surface of Edge3	0	9400	1880	22.58	23	1.102	0.08	0.790	0.870
19	WCDMA Band II	RMC12.2K	Curved surface of Edge3	0	9262	1852.4	22.87	23	1.030	0.02	0.756	0.779
20	WCDMA Band II	RMC12.2K	Curved surface of Edge3	0	9538	1907.6	22.5	23	1.122	0.05	0.657	0.737

<WLAN2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
41	WLAN 2.4GHz	802.11b	Bottom Face	0	11	2462	12.68	13	1.076	1.000	0.09	1.030	1.109
42	WLAN 2.4GHz	802.11b	Edge 1	0	11	2462	12.68	13	1.076	1.000	0.03	0.163	0.175
44	WLAN 2.4GHz	802.11b	Bottom Face	0	1	2412	12.39	13	1.151	1.000	-0.01	0.774	0.891
45	WLAN 2.4GHz	802.11b	Bottom Face	0	6	2437	12.17	13	1.211	1.000	0.06	0.915	1.108
46	WLAN 2.4GHz	802.11g	Bottom Face	0	11	2462	13.94	14	1.014	1.121	-0.01	1.340	1.524
47	WLAN 2.4GHz	802.11g	Bottom Face	0	1	2412	13.35	14	1.162	1.121	-0.03	0.972	1.266
48	**WLAN 2.4GHz**	**802.11g**	**Bottom Face**	**0**	**6**	**2437**	**13.52**	**14**	**1.117**	**1.121**	**-0.07**	**1.220**	**1.528**
49	WLAN 2.4GHz	802.11n-HT20	Bottom Face	0	11	2462	13.02	13.5	1.116	1.123	0.02	1.070	1.341
50	WLAN 2.4GHz	802.11n-HT20	Bottom Face	0	1	2412	12.26	13.5	1.329	1.123	-0.03	0.751	1.121
51	WLAN 2.4GHz	802.11n-HT20	Bottom Face	0	6	2437	12.48	13.5	1.264	1.123	-0.04	0.965	1.369
53	WLAN 2.4GHz	802.11g	Curved surface of Edge1	0	11	2462	13.94	14	1.014	1.121	0.09	0.939	1.068
54	WLAN 2.4GHz	802.11g	Curved surface of Edge1	0	1	2412	13.35	14	1.014	1.121	-0.02	0.804	0.914
55	WLAN 2.4GHz	802.11g	Curved surface of Edge1	0	6	2437	13.52	14	1.117	1.121	0.01	0.654	0.819

12.3 Repeated SAR Measurement

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
25	GSM850	GPRS (3 Tx slots)	Bottom Face	0	189	836.4	28.63	29	1.089	-	-0.02	0.809	1	0.881
27	GSM850	GPRS (3 Tx slots)	Bottom Face	0	189	836.4	28.63	29	1.089	-	-0.09	0.807	1.002	0.879
15	WCDMA Band II	RMC 12.2K	Bottom Face	0	9400	1880	22.58	23	1.102	-	0.1	1.220	1	1.344
17	WCDMA Band II	RMC 12.2K	Bottom Face	0	9400	1880	22.58	23	1.102	-	0.08	1.210	1.008	1.333
46	WLAN 2.4GHz	802.11g	Bottom Face	0	11	2462	13.94	14	1.014	1.121	-0.01	1.340	1	1.524
52	WLAN 2.4GHz	802.11g	Bottom Face	0	11	2462	13.94	14	1.014	1.121	-0.06	1.320	1.015	1.501

Note:

1. Per KDB 865664 D01v01r03, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01r03, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the largest SAR to the smallest SAR among original and repeated measurement.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

12.4 Highest SAR Plot

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.22

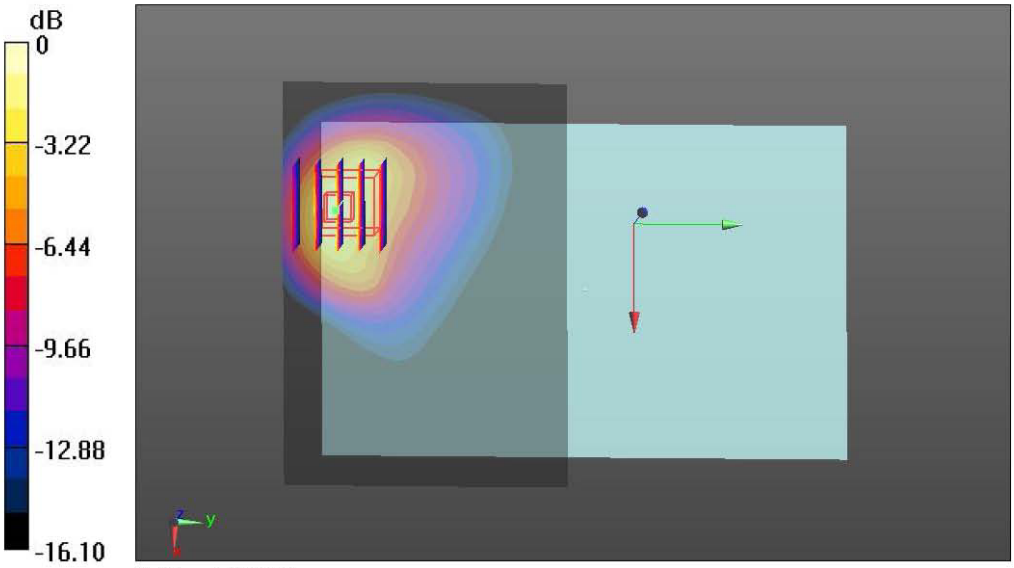
26 GSM850_GPRS(3 Tx slots)_Bottom Face_0cm_Ch251

Communication System: UID 0, GPRS/EDGE11 (0); Frequency: 848.8 MHz;Duty Cycle: 1:2.77
Medium: MSL_835_140222 Medium parameters used: f = 848.8 MHz; σ = 1.026 S/m; ε_r = 56.11; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(9.54, 9.54, 9.54); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Ch251/Area Scan (101x71x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.06 W/kg

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.756 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 0.797 W/kg; SAR(10 g) = 0.423 W/kg
Maximum value of SAR (measured) = 1.25 W/kg



0 dB = 1.25 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.22

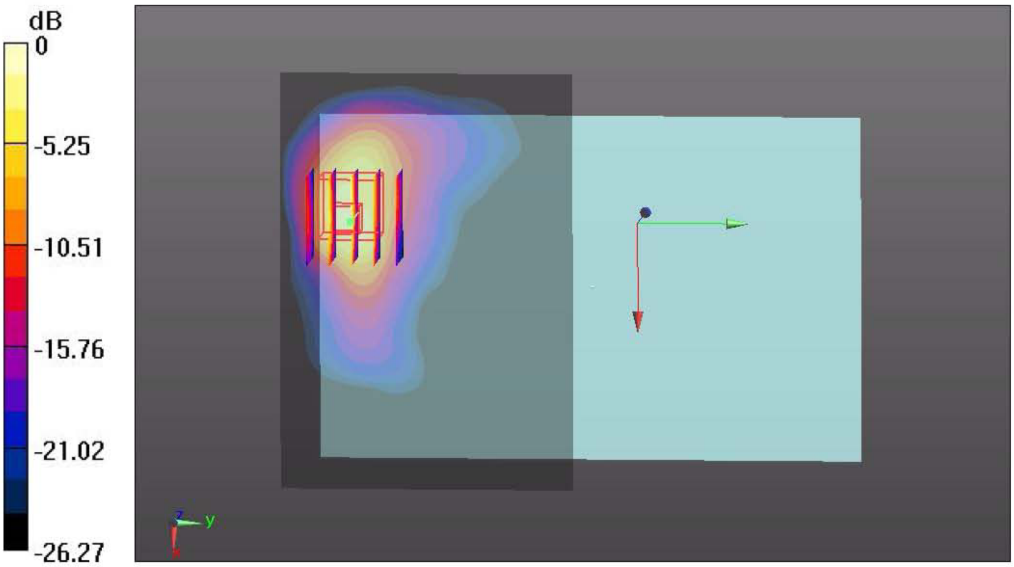
06 GSM1900_GPRS(3 Tx slots)_Bottom Face_0cm_Ch810

Communication System: UID 0, GPRS/EDGE11 (0); Frequency: 1909.8 MHz;Duty Cycle: 1:2.77
Medium: MSL_1900_140222 Medium parameters used: f = 1919.8 MHz; σ = 1.544 S/m; ε_r = 54.586; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.55, 7.55, 7.55); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Ch810/Area Scan (101x71x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.34 W/kg

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.448 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.44 W/kg
SAR(1 g) = 1.040 W/kg; SAR(10 g) = 0.435 W/kg
Maximum value of SAR (measured) = 1.88 W/kg



0 dB = 1.88 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.22

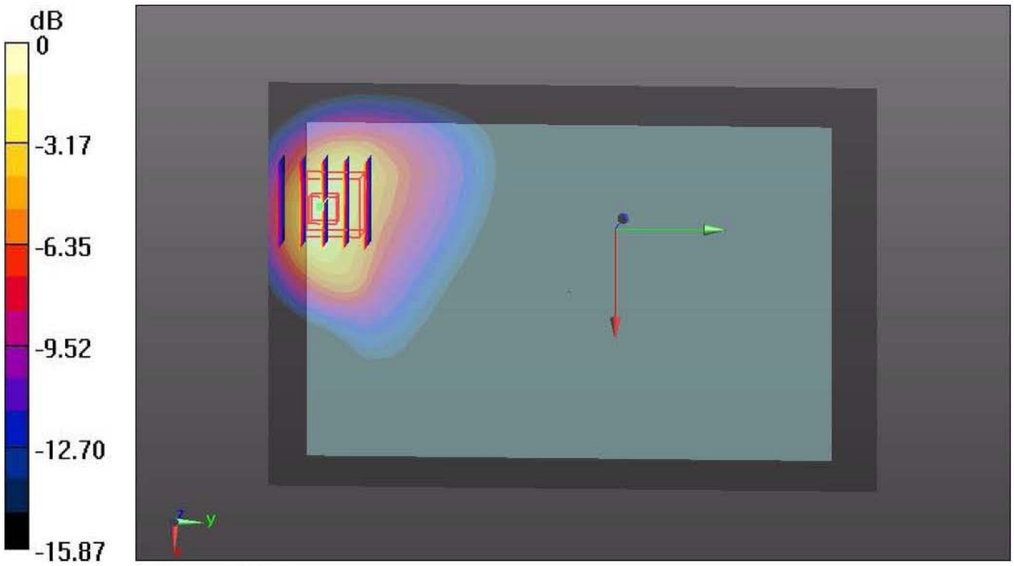
31 WCDMA Band V_RMC 12.2K_Bottom Face_0cm_Ch4132

Communication System: UID 0, UMTS (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_140222 Medium parameters used: f = 826.4 MHz; σ = 1.002 S/m; ε_r = 56.337; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(9.54, 9.54, 9.54); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Ch4132/Area Scan (101x151x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.789 W/kg

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.460 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.595 W/kg; SAR(10 g) = 0.315 W/kg
Maximum value of SAR (measured) = 0.937 W/kg



0 dB = 0.937 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.22

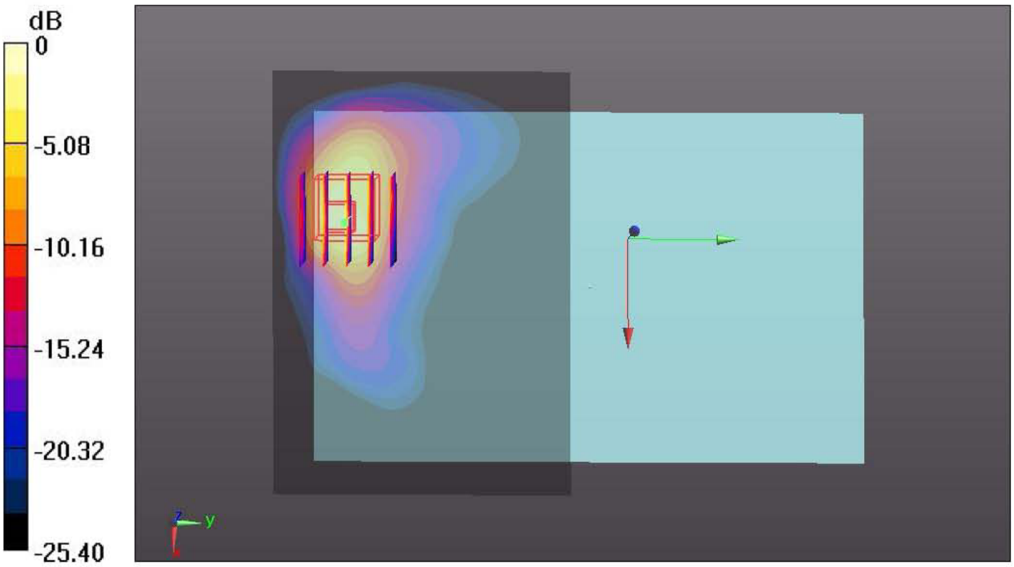
15 WCDMA Band II_RMC 12.2K_Bottom Face_0cm_Ch9400

Communication System: UID 0, UMTS (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_140222 Medium parameters used: f = 1880 MHz; σ = 1.507 S/m; ε_r = 54.733; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.55, 7.55, 7.55); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Ch9400/Area Scan (101x71x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.57 W/kg

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.794 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 2.84 W/kg
SAR(1 g) = 1.220 W/kg; SAR(10 g) = 0.518 W/kg
Maximum value of SAR (measured) = 2.22 W/kg



0 dB = 2.22 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.24

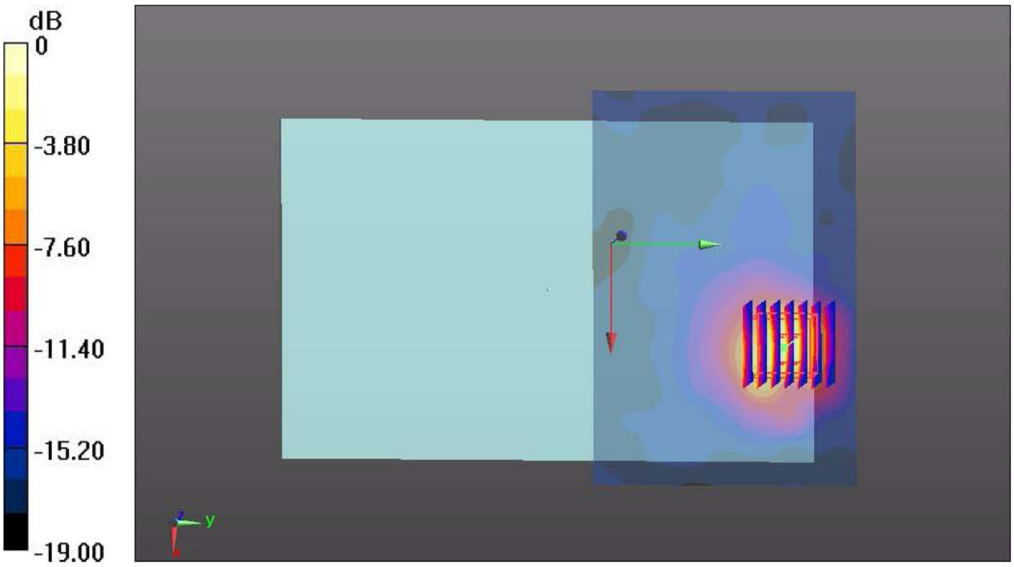
48 WLAN2.4GHz_802.11g_Bottom Face_0cm_Ch6

Communication System: UID 0, WIFI (0); Frequency: 2437 MHz;Duty Cycle: 1:1.121
Medium: MSL_2450_140224 Medium parameters used: f = 2437 MHz; σ = 1.931 S/m; ε_r = 51.715; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.07, 7.07, 7.07); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Ch6/Area Scan (121x81x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 2.19 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.161 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.71 W/kg
SAR(1 g) = 1.220 W/kg; SAR(10 g) = 0.507 W/kg
Maximum value of SAR (measured) = 1.96 W/kg



0 dB = 1.96 W/kg

13. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Tablet		Note
		Head	Body	
1.	GSM(Voice) + WLAN2.4GHz(data)	Yes	Yes	
2.	WCDMA(Voice) + WLAN2.4GHz(data)	Yes	Yes	
3.	GSM(Voice) + Bluetooth(data)	Yes	Yes	
4.	WCDMA((Voice) + Bluetooth(data)	Yes	Yes	
5.	GPRS/EDGE(Data) + WLAN 2.4GHz	Yes	Yes	2.4GHz Hotspot
6.	WCDMA(Data) + WLAN 2.4GHz	Yes	Yes	2.4GHz Hotspot
7.	GPRS/EDGE(Data) + Bluetooth	Yes	Yes	Bluetooth Tethering
8.	WCDMA(Data) + Bluetooth	Yes	Yes	Bluetooth Tethering

Note:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either GSM or WCDMA according to the network signal condition; therefore, they will not transmit simultaneously.
3. The Reported SAR summation is calculated based on the same configuration and test position.
4. Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where ($x_1$, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
   If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
   iii) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg
5. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05r02 based on the formula below.
   i) (*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[$\sqrt{f(GHz)}$/*x*] W/kg for *test separation distances* ≤ 50 mm; where *x* = 7.5 for 1-g SAR, and *x* = 18.75 for 10-g SAR.
   ii) When the minimum test separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
   iii) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.
   iv) If the test separation distance (antenna-user) is < 5mm, 5mm is used for estimated SAR calculation.

In this report, 50mm separation is applied to conservatively estimate SAR value for separation distance > 50mm

Max Power	Exposure Position	Head	Bottom Face	Edge 2	Edge 3	Edge 4
	Test separation (mm)	0	0	0	0	0
4 dBm	Antenna to user distance (mm)	5	5	75	175	15
	Estimated SAR (W/kg)	0.126	0.126	0.013	0.013	0.042

13.1 Head Exposure Conditions

< WWAN + WLAN >

	WWAN-PCE			WLAN 2.4GHz -DTS		WWAN + WLAN 2.4GHz (W/kg)	SPLSR ≤ 0.04	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN SAR (W/kg)			
Right Cheek	GSM850	61	0.006	105	0.346	0.35		
	GSM1900	81	0.028	105	0.346	0.37		
	WCDMA Band V	71	0.009	105	0.346	0.36		
	WCDMA Band II	91	0.022	105	0.346	0.37		
Right Tilted	GSM850	62	0.012	102	0.216	0.23		
	GSM1900	82	0.012	102	0.216	0.23		
	WCDMA Band V	72	0.010	102	0.216	0.23		
	WCDMA Band II	92	0.012	102	0.216	0.23		
Left Cheek	GSM850	63	0.017	103	0.154	0.17		
	GSM1900	83	0.020	103	0.154	0.17		
	WCDMA Band V	73	0.013	103	0.154	0.17		
	WCDMA Band II	93	0.020	103	0.154	0.17		
Left Tilted	GSM850	64	0.012	104	0.124	0.14		
	GSM1900	84	0.011	104	0.124	0.14		
	WCDMA Band V	74	0.009	104	0.124	0.13		
	WCDMA Band II	94	0.011	104	0.124	0.14		

< WWAN + Bluetooth >

	WWAN-PCE			Bluetooth-DSS	WWAN + Bluetooth (W/kg)	SPLSR ≤ 0.04	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Estimated SAR (W/kg)			
Right Cheek	GSM850	61	0.006	0.126	0.13		
	GSM1900	81	0.028	0.126	0.15		
	WCDMA Band V	71	0.009	0.126	0.14		
	WCDMA Band II	91	0.022	0.126	0.15		
Right Tilted	GSM850	62	0.012	0.126	0.14		
	GSM1900	82	0.012	0.126	0.14		
	WCDMA Band V	72	0.01	0.126	0.14		
	WCDMA Band II	92	0.012	0.126	0.14		
Left Cheek	GSM850	63	0.017	0.126	0.14		
	GSM1900	83	0.02	0.126	0.15		
	WCDMA Band V	73	0.013	0.126	0.14		
	WCDMA Band II	93	0.02	0.126	0.15		
Left Tilted	GSM850	64	0.012	0.126	0.14		
	GSM1900	84	0.011	0.126	0.14		
	WCDMA Band V	74	0.009	0.126	0.14		
	WCDMA Band II	94	0.011	0.126	0.14		

13.2 Body Exposure Conditions

< WWAN + WLAN >

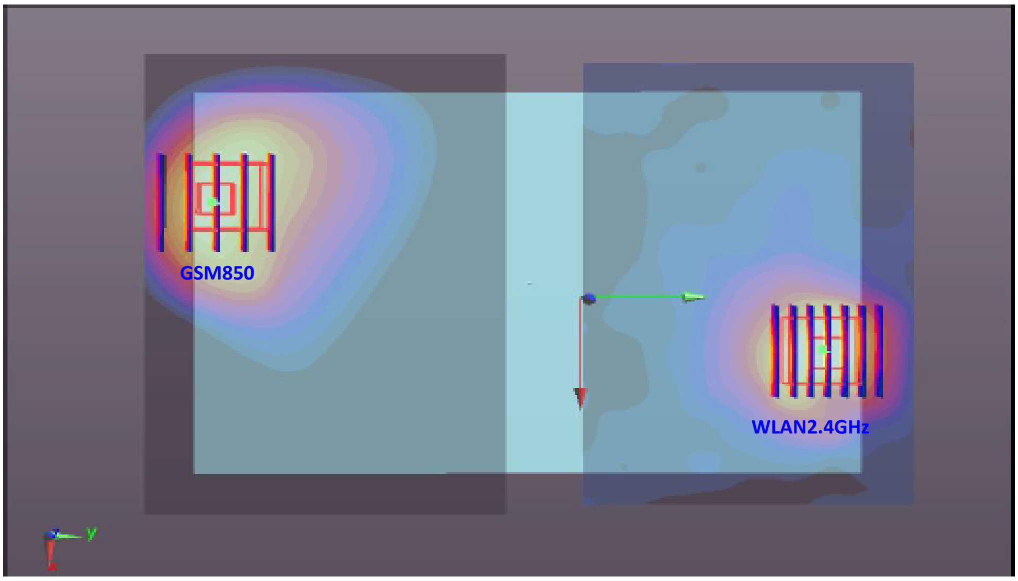
Position	WWAN-PCE			WLAN 2.4GHz-DTS		WWAN + WLAN 2.4GHz (W/kg)	SPLSR ≤0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN SAR (W/kg)			
Bottom Face	GSM850	26	0.886	48	1.528	2.41	0.02	#1
	GSM1900	6	1.170	48	1.528	2.70	0.03	#2
	WCDMA Band V	31	0.685	48	1.528	2.21	0.02	#3
	WCDMA Band II	15	1.344	48	1.528	2.87	0.03	#4
Edge1	GSM850			42	0.175	0.18		
	GSM1900			42	0.175	0.18		
	WCDMA Band V			42	0.175	0.18		
	WCDMA Band II			42	0.175	0.18		
Edge2	GSM850	22	0.032			0.03	-	-
	GSM1900	2	0.115			0.12	-	-
	WCDMA Band V	32	0.028			0.03	-	-
	WCDMA Band II	12	0.133			0.13	-	-
Edge3	GSM850	23	0.289			0.29	-	-
	GSM1900	3	0.415			0.42	-	-
	WCDMA Band V	33	0.216			0.22	-	-
	WCDMA Band II	18	0.870			0.87	-	-
Edge4	GSM850	24	0.018			0.02	-	-

<WWAN + Bluetooth>

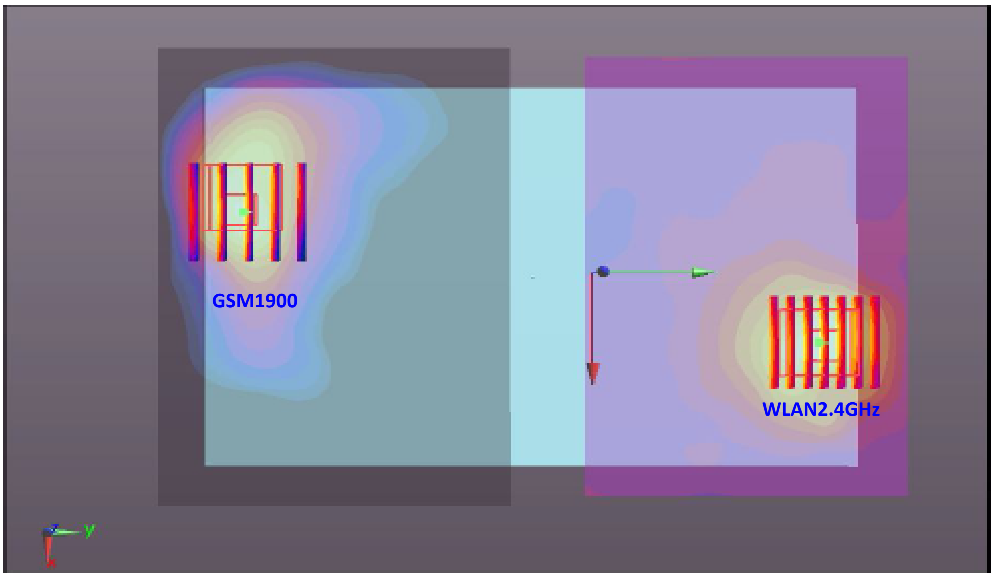
Position	WWAN-PCE			Bluetooth-DSS	WWAN + Bluetooth (W/kg)	SPLSR ≤0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Estimated SAR (W/kg)			
Bottom Face	GSM850	26	0.886	0.126	1.01	-	-
	GSM1900	6	1.17	0.126	1.30	-	-
	WCDMA Band V	31	0.685	0.126	0.81	-	-
	WCDMA Band II	15	1.344	0.126	1.47	-	-
Edge2	GSM850	22	0.032	0.013	0.05	-	-
	GSM1900	2	0.115	0.013	0.13	-	-
	WCDMA Band V	32	0.028	0.013	0.04	-	-
	WCDMA Band II	12	0.133	0.013	0.15	-	-
Edge3	GSM850	23	0.289	0.013	0.30	-	-
	GSM1900	3	0.415	0.013	0.43	-	-
	WCDMA Band V	33	0.216	0.013	0.23	-	-
	WCDMA Band II	18	0.870	0.013	0.88	-	-
Edge4	GSM850	24	0.018	0.042	0.06	-	-

13.3 SPLSR Evaluation and Analysis

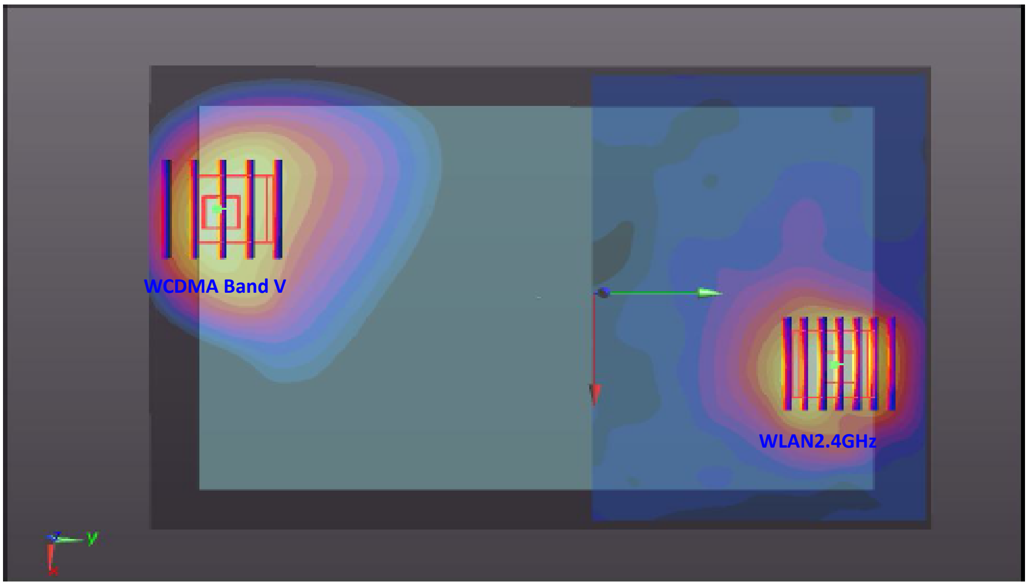
Case #1 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
26	GSM850	Bottom Face	0.886	0	-0.027	-0.093	-0.181	184.1	2.41	0.02	Not required
48	WLAN2.4GHz		1.528	0	0.0216	0.0846	-0.181				



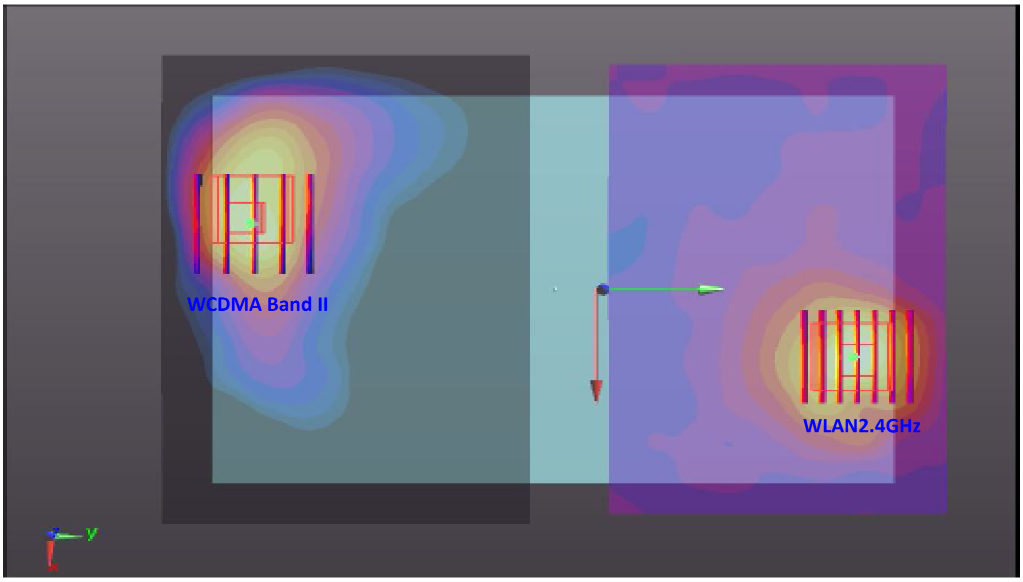
Case #2 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
6	GSM1900	Bottom Face	1.170	0	-0.021	-0.087	-0.181	176.8	2.70	0.03	Not required
48	WLAN2.4GHz		1.528	0	0.0216	0.0846	-0.181				



Case #3 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
31	WCDMA Band V	Bottom Face	0.685	0	-0.0285	-0.093	-0.181	184.5	2.21	0.02	Not required
48	WLAN2.4GHz		1.528	0	0.0216	0.0846	-0.181				



Case #4 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
15	WCDMA Band II	Bottom Face	1.344	0	-0.021	-0.087	-0.182	176.8	2.87	0.03	Not required
48	WLAN2.4GHz		1.528	0	0.0216	0.0846	-0.181				



Remark: Per KDB 447498 D01v05r02, if SPLSR ≤ 0.04, further evaluation is not required.

Test Engineer： Luke Lu

14. Uncertainty Assessment

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

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

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 14.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	1/√3	1/√6	1/√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 15.1. Standard Uncertainty for Assumed Distribution

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

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

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard 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 15.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

15. 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] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v01r02, "SAR Measurement Procedures for 802.11 a/b/g Transmitters", May 2007

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

[7] FCC KDB 941225 D01 v02, "SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA", October 2007

[8] FCC KDB 941225 D02 v02r02, "SAR Guidance for HSPA, HSPA+, DC-HSDPA and 1x-Advanced", May 2013.

[9] FCC KDB 941225 D03 v01, "Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE", December 2008

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

[11] FCC KDB 865664 D01 v01r03, "SAR Measurement Requirements for 100 MHz to 6 GHz", Feb 2014.

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.27

System Check_Head_835MHz_140227

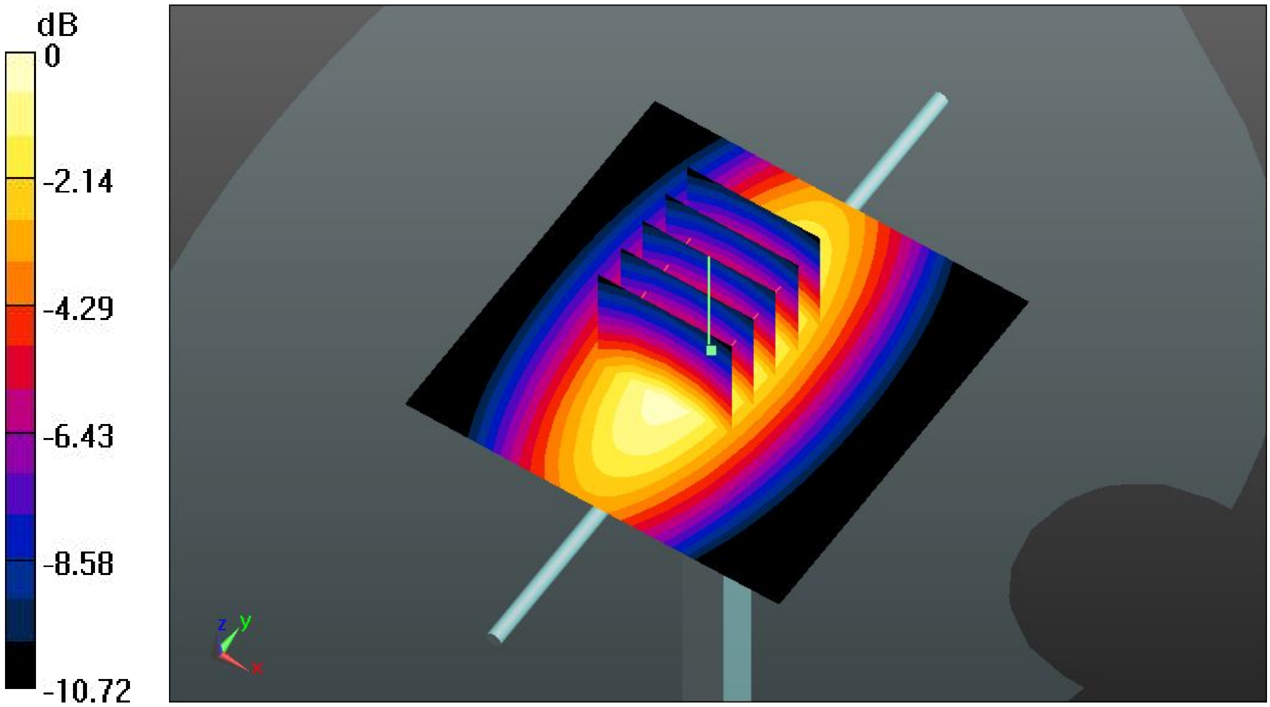
DUT: D835V2-SN: 4d091

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835_140227 Medium parameters used: f = 835 MHz; $\sigma = 0.897$ S/m; $\varepsilon_r = 40.781$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(9.68, 9.68, 9.68); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.06 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 59.979 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.07 W/kg



0 dB = 3.07 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.27

System Check_Head_1900MHz_140227

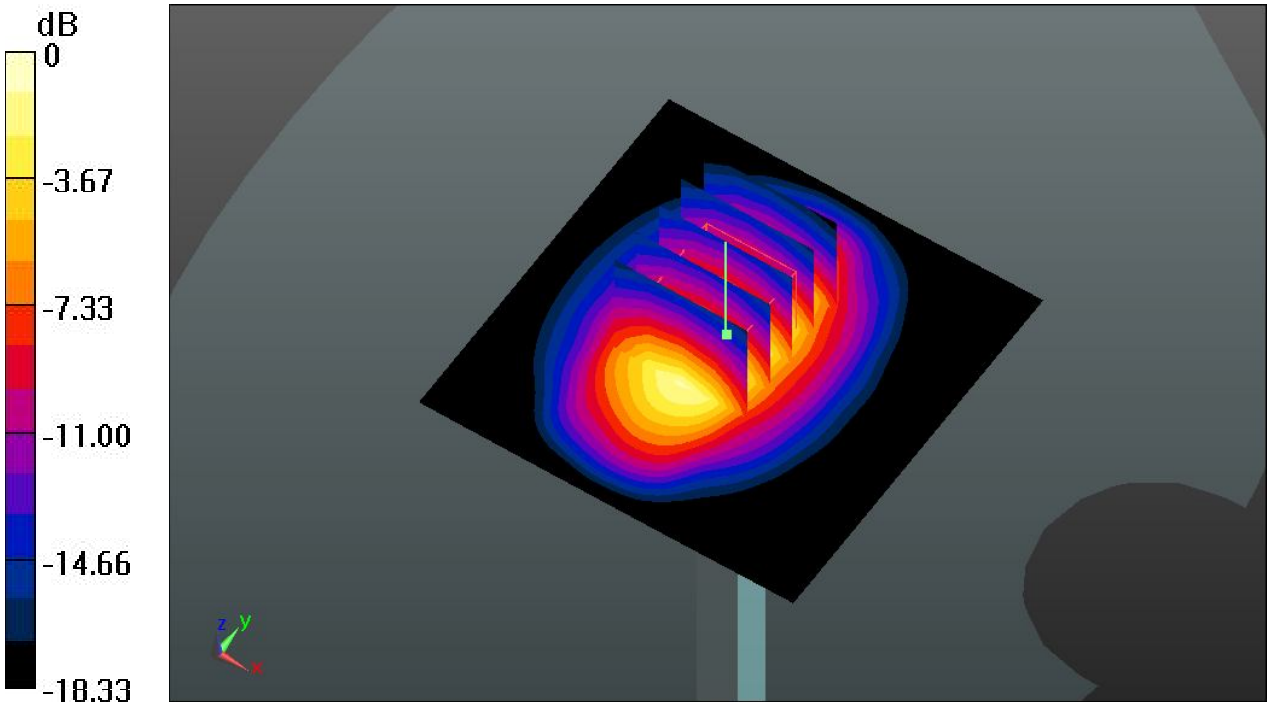
DUT: D1900V2-SN: 5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900_140227 Medium parameters used: f = 1900 MHz; σ = 1.417 S/m; ε_r = 40.994; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(8, 8, 8); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1670
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 94.546 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.75 W/kg; SAR(10 g) = 4.75 W/kg
Maximum value of SAR (measured) = 13.0 W/kg



0 dB = 13.0 W/kg

System Check_Head_2450MHz_140227

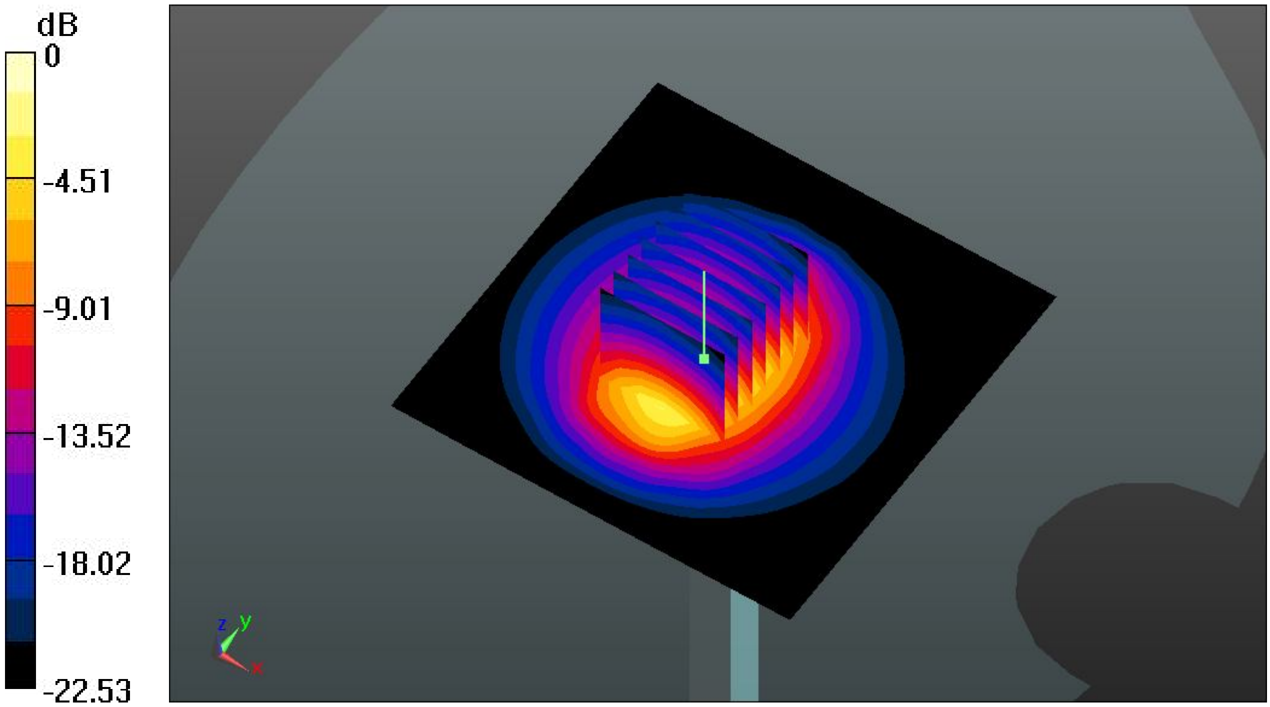
DUT: D2450V2-SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450_140227 Medium parameters used: f = 2450 MHz; σ = 1.823 S/m; ε_r = 37.961; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.22, 7.22, 7.22); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1671
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 19.2 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.223 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 26.1 W/kg
SAR(1 g) = 12.52 W/kg; SAR(10 g) = 5.61 W/kg
Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.1 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.22

System Check_Body_835MHz_140222

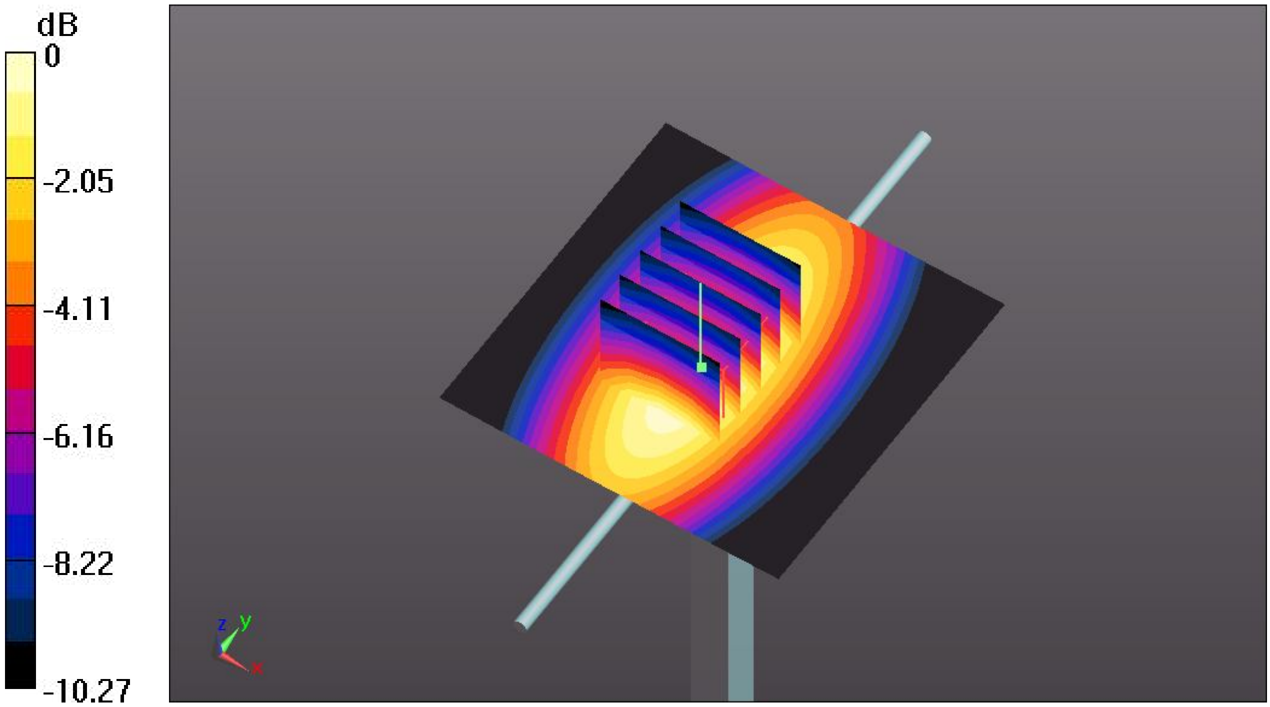
DUT: D835V2-SN: 4d091

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_140222 Medium parameters used: f = 835 MHz; σ = 1.011 S/m; ε_r = 56.243; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(9.54, 9.54, 9.54); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.45 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.348 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.28 W/kg
SAR(1 g) = 2.27 W/kg; SAR(10 g) = 1.5 W/kg
Maximum value of SAR (measured) = 2.45 W/kg



0 dB = 2.45 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.02.22

System Check_Body_1900MHz_140222

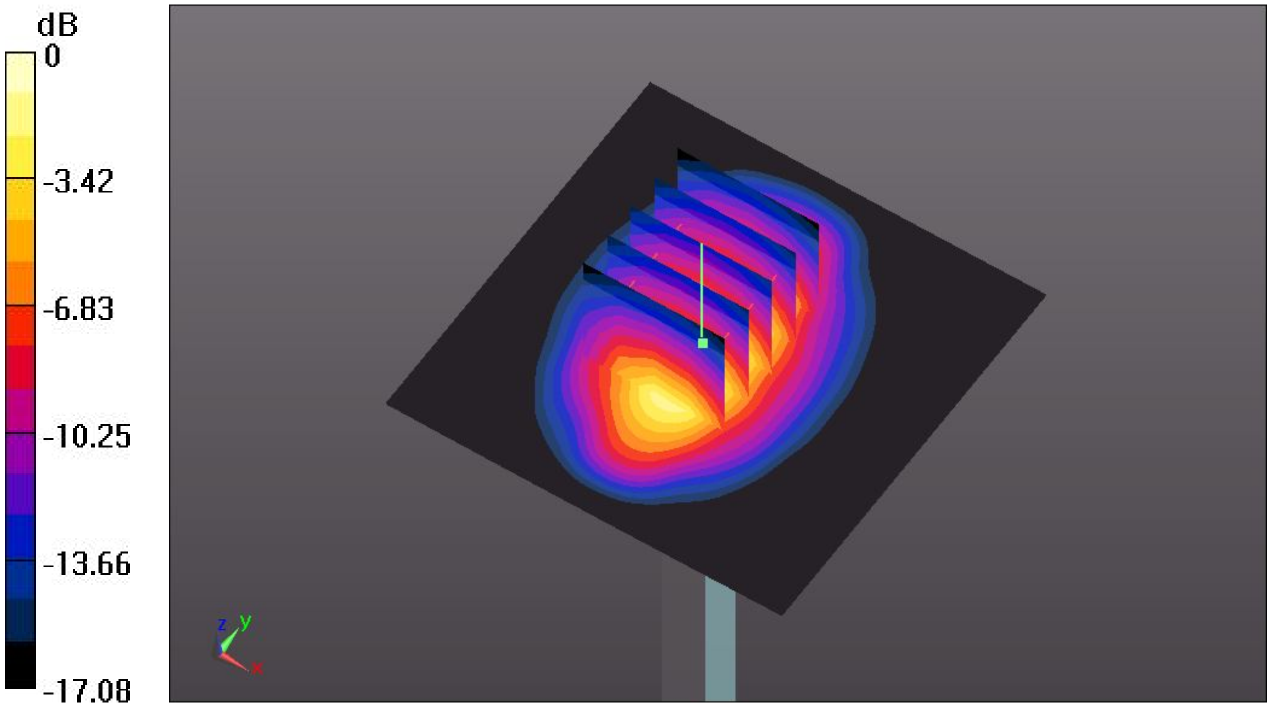
DUT: D1900V2-SN: 5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_140222 Medium parameters used: f = 1900 MHz; σ = 1.533 S/m; ε_r = 54.611; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.55, 7.55, 7.55); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 82.541 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.91 W/kg; SAR(10 g) = 4.99 W/kg
Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 13.4 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2014.02.24

System Check_Body_2450MHz_140224

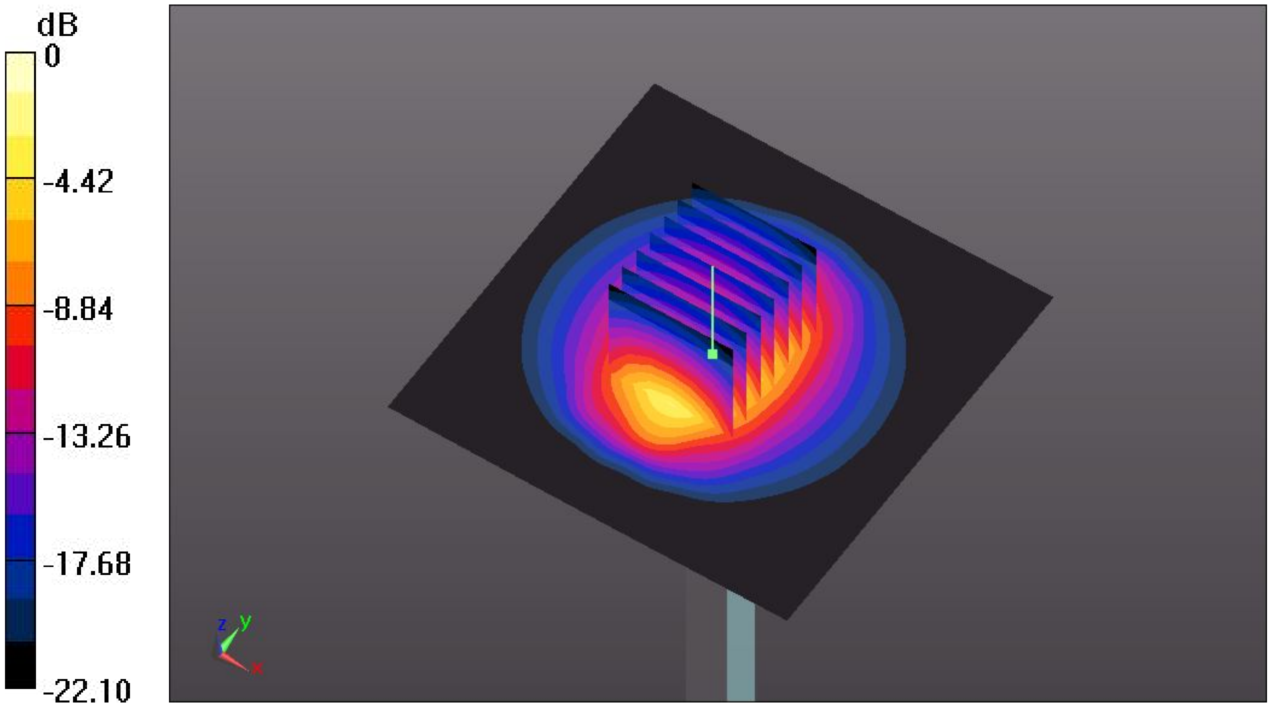
DUT: D2450V2-SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_140224 Medium parameters used: f = 2450 MHz; σ = 1.949 S/m; ε_r = 51.667; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(7.07, 7.07, 7.07); Calibrated: 2013.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1303; Calibrated: 2013.11.22
- Phantom: SAM3; Type: QDOVA002AA; Serial: TP:1149
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.781 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.2 W/kg
Maximum value of SAR (measured) = 20.7 W/kg



0 dB = 20.7 W/kg