



A D T

# FCC SAR Test Report

Report No. : SA120828C17

Applicant : CT Asia

Address : Unit 01, 15/F., Seaview Centre, 139-141 Hoi bun road, Kwun Tong, Kowloon, Hongkong

Product : Touch Book 9.7

FCC ID : YHLBLUTB97WIFI

Brand : BLU

Model No. : Touch Book 9.7

Standards : FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1991 / IEEE 1528:2003  
 FCC OET Bulletin 65 Supplement C (Edition 01-01)  
 KDB 248227 D01 v01r02 / KDB 447498 D01 v04

Date of Testing : Oct. 29, 2012

**CERTIFICATION:** The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., China Branch - Dongguan Lab**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by A2LA or any government agencies.

Prepared By : Evonne Liu  
 Evonne Liu / Specialist

Approved By : Roy Wu  
 Roy Wu / Manager



No: 2951.01

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



**Table of Contents**

**Release Control Record ..... 3**

**1. Summary of Maximum SAR Value ..... 4**

**2. Description of Equipment Under Test ..... 5**

**3. SAR Measurement System ..... 6**

    3.1 Definition of Specific Absorption Rate (SAR)..... 6

    3.2 SPEAG DASY System ..... 6

        3.2.1 Robot..... 7

        3.2.2 Probes..... 8

        3.2.3 Data Acquisition Electronics (DAE) ..... 8

        3.2.4 Phantoms ..... 9

        3.2.5 Device Holder..... 9

        3.2.6 System Validation Dipoles ..... 9

        3.2.7 Tissue Simulating Liquids..... 10

    3.3 SAR System Verification ..... 11

    3.4 SAR Measurement Procedure ..... 12

        3.4.1 Area & Zoom Scan Procedure ..... 12

        3.4.2 Volume Scan Procedure..... 12

        3.4.3 Power Drift Monitoring..... 12

        3.4.4 Spatial Peak SAR Evaluation ..... 13

        3.4.5 SAR Averaged Methods ..... 13

**4. SAR Measurement Evaluation ..... 14**

    4.1 EUT Configuration and Setting..... 14

    4.2 EUT Testing Position ..... 14

    4.3 Tissue Verification ..... 14

    4.4 System Verification..... 14

    4.5 Conducted Power Results..... 15

    4.6 SAR Testing Results..... 15

        4.6.1 SAR Results for Body..... 15

        4.6.2 Simultaneous Multi-band Transmission Evaluation ..... 15

**5. Calibration of Test Equipment..... 16**

**6. Measurement Uncertainty..... 17**

**7. Information on the Testing Laboratories..... 18**

**Appendix A. SAR Plots of System Verification**

**Appendix B. SAR Plots of SAR Measurement**

**Appendix C. Calibration Certificate for Probe and Dipole**

**Appendix D. Photographs of EUT and Setup**



## Release Control Record

Issue No.	Reason for Change	Date Issued
R01	Original release	Jan. 09, 2013

## 1. Summary of Maximum SAR Value

Mode / Band	Test Position	SAR-1g (W/kg)
WLAN 2.4GHz	Body (0 cm Gap)	0.489
Bluetooth	Body (0 cm Gap)	N/A

**Note:**

1. The SAR limit (**1.6 W/kg**) for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1991.
2. Since the Bluetooth maximum power is less than 60/f, SAR testing for Bluetooth is not required.



# FCC SAR Test Report

## 2. Description of Equipment Under Test

<b>EUT Type</b>	Touch Book 9.7
<b>FCC ID</b>	YHLBLUTB97WIFI
<b>Brand Name</b>	BLU
<b>Model Name</b>	Touch Book 9.7
<b>HW Version</b>	P3
<b>SW Version</b>	rk30_ics_v2.23.00
<b>Tx Frequency Bands (Unit: MHz)</b>	WLAN : 2400 ~ 2483.5 Bluetooth : 2400 ~ 2483.5
<b>Uplink Modulations</b>	802.11b : DSSS 802.11g/n : OFDM Bluetooth : GFSK
<b>Maximum AVG Conducted Power (Unit: dBm)</b>	802.11b : 14.68 802.11g : 14.62 802.11n HT20 : 13.50
<b>Antenna Type</b>	PIFA Antenna
<b>EUT Stage</b>	Identical Prototype

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

### List of Accessory:

<b>Battery</b>	<b>Brand Name</b>	BLU
	<b>Model Name</b>	N.A
	<b>Power Rating</b>	7.4Vdc, 6000mAh
	<b>Type</b>	Li-ion

### **3. SAR Measurement System**

#### **3.1 Definition of Specific Absorption Rate (SAR)**

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

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

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

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

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

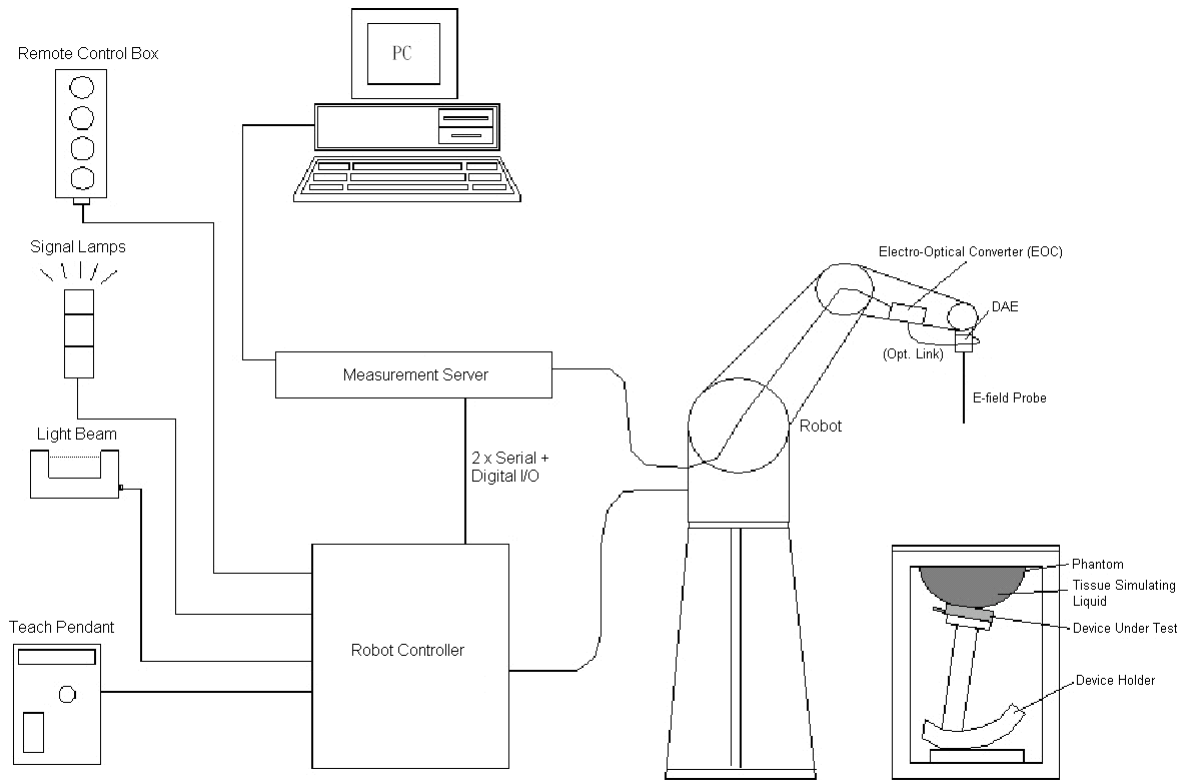
$$\text{SAR} = \frac{\sigma |E|^2}{\rho}$$

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  is the mass density of the tissue and E is the RMS electrical field strength.

#### **3.2 SPEAG DASY System**

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC.

# FCC SAR Test Report



**Fig-3.1 DASY System Setup**

## 3.2.1 Robot

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

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





**Fig-3.2 DASY5**

# FCC SAR Test Report


## 3.2.2 Probes

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

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

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


## 3.2.3 Data Acquisition Electronics (DAE)

<b>Model</b>	DAE3, DAE4	
<b>Construction</b>	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
<b>Measurement Range</b>	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)	
<b>Input Offset Voltage</b>	$< 5$ $\mu$ V (with auto zero)	
<b>Input Bias Current</b>	$< 50$ fA	
<b>Dimensions</b>	60 x 60 x 68 mm	




# FCC SAR Test Report


## 3.2.4 Phantoms

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

## 3.2.5 Device Holder

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

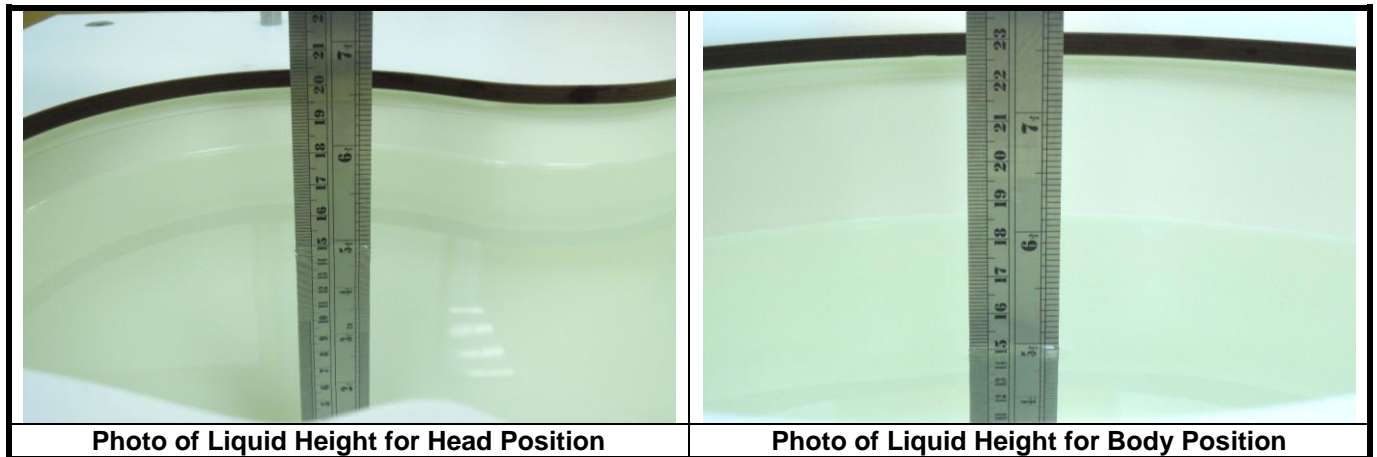
## 3.2.6 System Validation Dipoles

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

# FCC SAR Test Report

## 3.2.7 Tissue Simulating Liquids

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



The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 and FCC OET 65 Supplement C Appendix C. For the body tissue simulating liquids, the dielectric properties are defined in FCC OET 65 Supplement C Appendix C. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using an SPEAG DAK-3.5 Dielectric Probe Kit and an Agilent Network Analyzer.

**Table-3.1 Targets of Tissue Simulating Liquid**

Frequency (MHz)	Target Permittivity	Range of $\pm 5\%$	Target Conductivity	Range of $\pm 5\%$
<b>For Body</b>				
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05

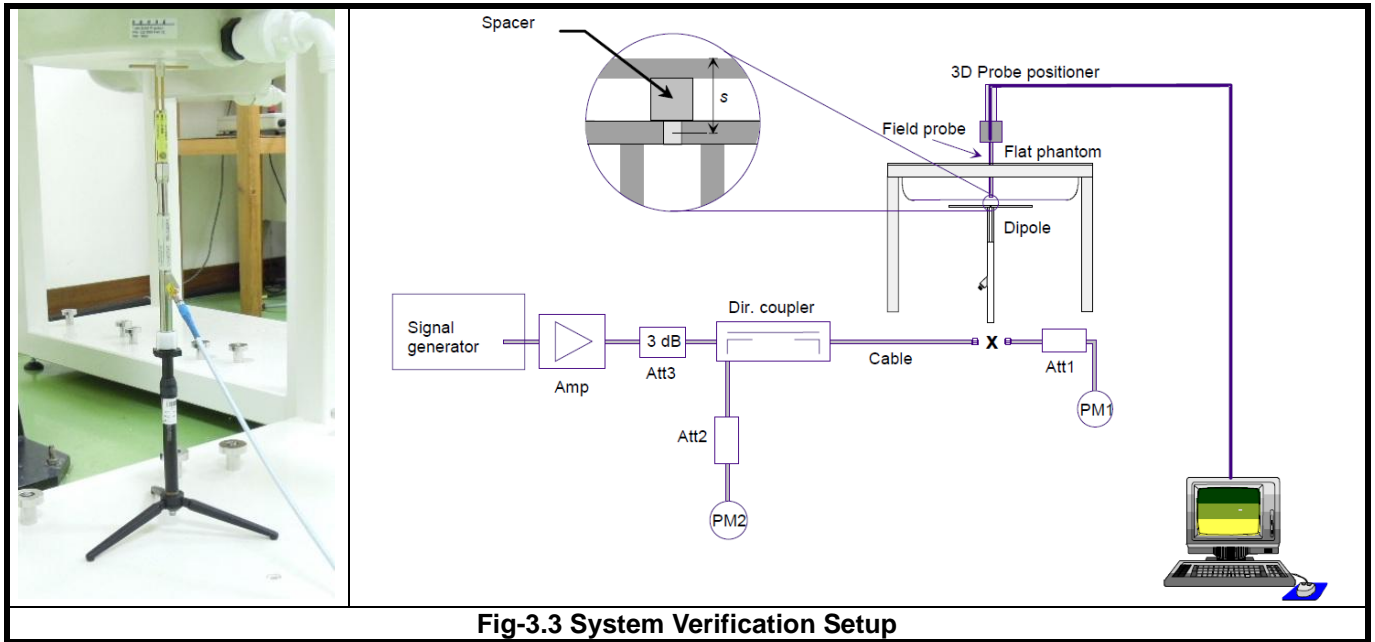
The following table gives the recipes for tissue simulating liquids.

**Table-3.2 Recipes of Tissue Simulating Liquid**

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
B2450	-	31.4	-	0.1	-	-	68.5	-

### 3.3 SAR System Verification

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



**Fig-3.3 System Verification Setup**

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

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

## FCC SAR Test Report

---

### **3.4 SAR Measurement Procedure**

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

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

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

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

#### **3.4.1 Area & Zoom Scan Procedure**

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for below 3 GHz, and 7x7x9 points with step size 4, 4 and 2.5 mm for above 5 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

#### **3.4.2 Volume Scan Procedure**

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

#### **3.4.3 Power Drift Monitoring**

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

## FCC SAR Test Report

---

### 3.4.4 Spatial Peak SAR Evaluation

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

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

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

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

### 3.4.5 SAR Averaged Methods

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

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

## 4. SAR Measurement Evaluation

### 4.1 EUT Configuration and Setting

For WLAN SAR testing, the EUT has installed WLAN engineering testing software which can provide continuous transmitting RF signal. According to KDB 248227 D01, WLAN SAR should be tested at the lowest data rate, and testing at higher data rate is not required when the maximum average output power is less than 1/4 dB higher than those measured at the lowest data rate. Since the WLAN power at lowest data rate has highest output power, WLAN SAR for this device was performed at the lowest data rate as set in 1 Mbps for 802.11b. This RF signal utilized in SAR measurement has almost 100% duty cycle for 802.11b, and the duty factor is 1 during WLAN SAR testing.

### 4.2 EUT Testing Position

According to KDB 447498, the SAR is needed for the antenna located within 5 cm from the surface/edge. Based on the antenna location shown in appendix D, the EUT was tested in two positions as **Rear Face** and **Primary Portrait**. In these positions, the separation distance between EUT and phantom is 0 cm.

### 4.3 Tissue Verification

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

Tissue Type	Frequency (MHz)	Liquid Temp. (°C)	Measured Conductivity ( $\sigma$ )	Measured Permittivity ( $\epsilon_r$ )	Target Conductivity ( $\sigma$ )	Target Permittivity ( $\epsilon_r$ )	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
B2450	2450	20.9	1.910	51.21	1.95	52.7	-2.05	-2.83	Oct. 29, 2012

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

### 4.4 System Verification

The measuring results for system check are shown as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Oct. 29, 2012	Body	2450	51.40	12.9	51.60	0.39	893	3873	1341

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



# FCC SAR Test Report

## 4.5 Conducted Power Results

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

Band	802.11b			802.11g		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	14.68	14.16	14.56	14.52	14.62	14.34

Band	802.11n (HT20)		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Average Power	12.70	13.02	13.50

## 4.6 SAR Testing Results

### 4.6.1 SAR Results for Body

Plot No.	Band	Test Position	Separation Distance (cm)	Channel	Power Drift (dB)	SAR-1g (W/kg)
101	802.11b	Rear Face	0	1	-0.01	0.489
102	802.11b	Primary Portrait	0	1	0.04	0.088

**Note:**

1. According to KDB 248227 D01, when the extrapolated maximum peak SAR for the maximum output power channel is  $\leq 1.6$  W/kg and the 1g averaged SAR is  $\leq 0.8$  W/kg, WLAN SAR testing for other channels is not required.
2. SAR testing for 802.11g/n is not required because its maximum power is less than 1/4 dB higher than 802.11b.

Test Engineer : Luke Lu

### 4.6.2 Simultaneous Multi-band Transmission Evaluation

Since the WLAN and Bluetooth share the same antenna and they cannot transmit simultaneously, therefore there is no simultaneous transmission issue.



## 5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Kit	SPEAG	D2450V2	893	Jul. 24, 2012	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3873	Aug. 06, 2012	Annual
Data Acquisition Electronics	SPEAG	DAE4	1341	Aug. 07, 2012	Annual
SAM Phantom	SPEAG	QD000P40CD	TP-1722	N/A	N/A
ENA Series Network Analyzer	Agilent	E5071C	MY46214638	Jun. 30, 2012	Annual
MXG Analog Signal Generator	Agilent	N5183A	MY50140980	Nov. 05, 2012	Annual
Power Meter	Agilent	N1914A	MY52180044	Aug. 24, 2012	Annual
Power Sensor	Agilent	E9304A	MY52050011	Aug. 23, 2012	Annual
EXA Spectrum Analyzer	Agilent	E7405A	MY45118807	May 14, 2012	Annual
Dielectric Assessment Kit	SPEAG	DAK-3.5	1076	Jul. 30, 2012	Annual
Thermometer	YFE	YF-160A	120100323	Sep. 03, 2012	Annual
Power Amplifier	TESEQ	CBA 1G-150	T44029	Dec. 28, 2011	Annual
Power Amplifier	TESEQ	CBA 3G-100	T44030	Dec. 28, 2011	Annual
Power Amplifier	TESEQ	CBA 6G-50	1041204	Dec. 28, 2011	Annual
Attenuator	Woken	00800A1G01L-03	N/A	Sep. 03, 2012	Annual



## 6. Measurement Uncertainty

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

Uncertainty budget for frequency range 300 MHz to 3 GHz



## **7. Information on the Testing Laboratories**

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

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

**China Dongguan Lab:**

No. 34, Guantai Rd., Houjie Town, Dongguan, Guangdong 523942, China

Tel: 86-769-8593-5656

Fax: 86-769-8599-1080

**Email:** [service.dg@cn.bureauveritas.com](mailto:service.dg@cn.bureauveritas.com)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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

---END---