Global Product Certification
EMC-EMF-Safety Approvals

EMC Technologies Pty Ltd
ABN 82 057 105 549
176 Harrick Road
Keilor Park
Victoria Australia 3042

Ph: + 613 9365 1000
Fax: + 613 9331 7455
email: melb@emctech.com.au

SAR Test Report

Report Number: M120827_FCC_AR5BHB116_SAR_2.4

Test Sample: STYLISTIC T series tablet PC
Radio Modules: WLAN HB116 AR5BHB116
Host PC Model Number: T732 / TH702

FCC ID: PPD-AR5BHB116
IC: 4104A-AR5BHB116
Date of Issue: 13th September 2012

CONTENTS

SAR TEST REPORT
Report Number: M120827_FCC_AR5BHB116_SAR_2.4
FCC ID: PPD-AR5BHB116
IC: 4104A-AR5BHB116

1.0 GENERAL INFORMATION

Table 1

Test Sample:	STYLISTIC T series tablet PC
Model Name:	T732 / TH702
Radio Modules:	WLAN AR5BHB116
Interface Type:	Half Mini-PCI Module
Device Category:	Portable Transmitter
Test Device:	Pre-Production Unit
FCC ID:	PPD-AR5BHB116
IC:	4104A-AR5BHB116
RF exposure Category:	General Population/Uncontrolled

Manufacturer: Fujitsu Limited

Test Standard/s:

1. Evaluating Compliance with FCC Guidelines For Human Exposure to Radiofrequency Electromagnetic Fields
   Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01)
2. Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands), RSS-102
3. **EN 62209-2:2010**
   Human exposure to radio frequency fields from hand-held and bodymounted wireless communication devices. Human models, instrumentation, and procedures.
   Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)

Statement Of Compliance: The Fujitsu TABLET Computer T732 / TH702 with Wireless LAN model AR5BHB116 and complied with the FCC General public/uncontrolled RF exposure limits of 1.6mW/g per requirements of 47CFR2.1093(d). It also complied with IC RSS-102 requirements.

Test Date: 7th September 2012

Test Officer:

Peter Jakubiec

Authorised Signature:

Chris Zombolas
Technical Director

SAR TEST REPORT
Portable TABLET Computer
Model: T732 / TH702
Report Number: M120827_FCC_AR5BHB116_SAR_2.4

2.0 INTRODUCTION

Testing was performed on the Fujitsu TABLET PC, Model: T732 / TH702 with ATHEROS Half Mini-PCI Wireless LAN Module (HB116 802.11a/b/g/n), Model: AR5BHB116. The HB116 module is an OEM product. The Half Mini-PCI Wireless LAN (WLAN) was tested in the dedicated host – STYLISTIC T SERIES, Model T732 / TH702. The system tested will be referred to as the DUT throughout this report.
There are two variants of the Fujitsu Tablet PC, Model: T732 / TH702 one that is equipped with the Bluetooth transmitter and Bluetooth antenna, and one variant that does not contain Bluetooth transmitter or Bluetooth antenna. SAR testing was conducted on the sample that is equipped with the Bluetooth transmitter and Bluetooth antenna. Additionally the test sample had the WWAN antenna present during testing but WWAN antenna was not transmitting.

The measurement test results mentioned herein only apply to the 2450MHz frequency band; an additional report titled “M120827_FCC_AR5BHB116_SAR_5.6” applies to the 5GHz range.

3.0 TEST SAMPLE TECHNICAL INFORMATION

(Information supplied by the client)

3.1 DUT (WLAN) Details

Table 2

Transmitter:	Half Mini-Card Wireless LAN Module
Wireless Module:	HB116 (11a/b/g/n)
Model Number:	AR5BHB116
Manufacturer:	Atheros Communication Inc,
Modulation Type:	DSSS for 802.11b OFDM for 802.11g OFDM for 802.11a OFDM for 802.11n
5GHz (802.11a/n)	BPSK, QPSK, 16QAM, 64QAM
2.4GHz (802.11b/g/n)	CCK, DQPSK, DBPSK, 16QAM, 64QAM
Maximum Data Rate:	802.11b = 11 Mbps, 802.11g and 802.11a = 54 Mbps 802.11n = 300 Mbps
Frequency Range:	2.412–2.462 GHz for 11b/g/n 5.18-5.32 GHz, 5.5-5.6 GHz and 5.745-5.825 GHz for 11a/n
Number of Channels:	11 channels for 11b/g/n with 20MHz Bandwidth 24 channels for 11a/n with 20MHz Bandwidth 18 channels for 11n with 40MHz Bandwidth
Antenna Types:	Nissei Electric Inverted F Antenna
Power Supply:	3.3 VDC from PCI Express bus

Table 3 Channels and Output power setting

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tx BW (MHz)	Average Power Target (dBm)		
					Ch A		Ch B
802.11b 2.4 GHz	1	2412	1	-	**16.5**		**16.5**
	6	2437					
	11	2462					
	13	2472					
802.11g 2.4 GHz	1	2412	6	-	**10.5**		**10.5**
	2	2417			**16.5**		**16.5**
	6	2437					
	10	2457					
	11	2462			**10.0**		**10.0**
	13	2472			**16.5**		**16.5**

NOTE: For 5GHz SAR results refer to report titled “M120827_FCC_AR5BHB116_SAR_5.6”.

DUT (Notebook PC) Details

Table 4

Host notebook :	STYLISTIC T series
Model Name:	T732 / TH702
Serial Number:	Pre-production Sample
Manufacturer:	FUJITSU LIMITED
CPU Type and Speed:	Core i7 2.9GHz
LCD	12.5”WXGA(1280x800 : LP125WH2
Graphics chip	None
Wired LAN:	Intel 82579LM : 10 Base-T/100 Base-TX/1000Base-T
Modem:	None
Port Replicator Model:	FPCPR132
AC Adapter Model:	80W: ADP-80RB A(Delta), SEE100P2-19.0(Sanken), PJW1942N(Tamura), PJW1942NA(Tamura) 100W: A11-100-3A (Chicony)
Voltage:	19 V
Current Specs:	4.22A / 5.26A
Watts:	80W / 100W
Radio Modules:	WLAN (HB116 IEEE802.11a/b/g/n)
WLAN Model Number:	AR5BHB116
WLAN Manufacturer:	Atheros Corp.
Interface Type:	Half Mini-Card Wireless LAN Module
Radio Modules:	Bluetooth module
Model Number:	BCM92070MD_REF6
Manufacturer:	Broadcom
Interface Type:	USB

*The model numbers shown T732 and TH702 are for the same product. The difference between T732 and TH702 is color and target market.
The T732 is for commercial market.
The TH702 is for consumer market.

3.2 Test Sample Accessories

3.2.1 Battery Types

One type of Fujitsu Lithium Ion battery is used to power the DUT.

Table 5 Battery Details

Model	FPCBP373
V/mAh	10.8V/6700mAh

4.0 TEST SIGNAL, FREQUENCY AND OUTPUT POWER

The Atheros ART test tool was used to configure the WLAN for testing. The DUT Wireless LAN had a total of 11 channels within the 2412 to 2462 MHz frequency band and 24 channels within the frequency range 5180 to 5825 MHz. In The frequency range 2412 MHz to 2462 MHz the DUT operates in 2 modes, OFDM and DSSS. Within the 5180 to 5825 MHz frequency range the device operates in OFDM mode only. For the SAR measurements the device was operating in continuous transmit mode using programming codes supplied by Fujitsu. The fixed frequency channels used in the testing are shown in Table Below.

The Bluetooth module operates over 79 channels within the frequency range 2402 to 2480 MHz. It is possible for the Bluetooth module to operate simultaneously with the WLAN module (co-transmission). However, due to low output power of Bluetooth module (less than 5mW), standalone SAR measurement for Bluetooth module was not conducted (as per KDB 616217).

The test results mentioned in this report only apply to the 2450MHz frequency range. An additional report titled *"M120827_FCC_AR5BHB116_SAR_5.6"* is specific to the 5GHz range.

The WLAN modules can be configured in a number of different data rates. It was found that the highest source based time averaged power was measured when using the lowest data rates available in each mode. This lowest data rate corresponds to 6Mbps in OFDM mode and 1Mbps in DSSS mode.

The frequency span of the 2450 MHz range Band was more than 10MHz consequently; the SAR levels of the test sample were measured for lowest, centre and highest channels in the applicable modes. The DUT is capable of using two antennas transmitting simultaneously (HT8 DATA mode) the power level is 3dB lower (50%) than if a single antenna was transmitting. There were no wires or other connections to the DUT during the SAR measurements.

At the beginning of the SAR tests, the conducted power of the device was measured after temporary modification of antenna connector inside the device's TX RX compartment. Measurements were performed with a calibrated Power Meter. The Transmitter power was set to be equal or higher than the power specified by the manufacturer.

4.1 Battery Status

The device battery was fully charged prior to commencement of measurement. Each SAR test was completed within 30 minutes. The battery condition was monitored by measuring the RF field at a defined position inside the phantom before the commencement of each test and again after the completion of the test. It was not possible to perform conducted power measurements at the output of the device, at the beginning and end of each scan due to lack of a suitable antenna port. The uncertainty associated with the power drift was less than 5% and was assessed in the uncertainty budget.

5.0 DETAILS OF TEST LABORATORY

5.1 Location

EMC Technologies Pty Ltd
176 Harrick Road
Keilor Park, (Melbourne) Victoria
Australia 3042

Telephone:	+61 3 9365 1000
Facsimile:	+61 3 9331 7455
email:	melb@emctech.com.au
website:	www.emctech.com.au

5.2 Accreditations

EMC Technologies Pty. Ltd. is accredited by the National Association of Testing Authorities, Australia (NATA).
NATA Accredited Laboratory Number: 5292

EMC Technologies Pty Ltd is NATA accredited for the following standards:

Table 6

ACMA:	Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2003 + Amdt (No. 1):2007
FCC:	Guidelines for Human Exposure to RF Electromagnetic Field OET65C 01/01
EN 50360: 2001	Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)
EN 62209-1:2006	Human Exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models instrumentation and procedures. **Part 1:** Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (300 MHz to 3 GHz)
EN 62209-2:2010	Human Exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models instrumentation and procedures **Part 2**: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz
IEEE 1528: 2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head Due to Wireless Communications Devices: Measurement Techniques.

Refer to NATA website www.nata.asn.au for the full scope of accreditation.

5.3 Environmental Factors

The measurements were performed in a shielded room with no background RF signals. The temperature in the laboratory was controlled to within 21±1°C, the humidity was 38%. The liquid parameters are measured daily prior to the commencement of each test. Tests were performed to check that reflections within the environment did not influence the SAR measurements. The noise floor of the DASY5 SAR measurement system using the SN1380 probe was less than 5μV in both air and liquid mediums.

6.0 DESCRIPTION OF SAR MEASUREMENT SYSTEM

Table 7

Applicable Head Configurations Applicable Body Configurations	: None : Lap Held Position : Edge On Position : Bystander

6.1 Probe Positioning System

The measurements were performed with the state-of-the-art automated near-field scanning system **DASY5 Version 52** from Schmid & Partner Engineering AG (SPEAG). The DASY5 fully complies with the OET65 C (01-01), IEEE 1528, EN62209-1 and EN62209-2 SAR measurement requirements.

6.2 E-Field Probe Type and Performance

The SAR measurements were conducted with SPEAG dosimetric probe ET3DV6 Serial: 1380. Please refer to appendix C for detailed information.

6.3 System Verification

6.3.1 System Verification Results @ 2450MHz

The following tables lists the dielectric properties of the tissue simulating liquid measured prior to SAR system verification. The results of the system verification are listed in columns 4 and 5. The forward power into the reference dipole for SAR system verification was adjusted to 250 mW.

Table 8 System Verification Results (Dipole: SPEAG D2450V2 SN: 724)

1. System Frequency and Verification Date	2. ∈r (measured)	3. σ (mho/m) (measured)	4. Measured SAR 1g (mW/g)	5. Measured SAR 10g (mW/g)
2450MHz 7^{th} Sep 2012	52.1	1.98	14.0	6.55

6.3.2 Deviation from reference system verification values

The SPEAG calibration reference SAR value is the SAR system verification result obtained in a specific dielectric liquid using the validation dipole (D2450V2) during calibration. The measured one-gram SAR should be within 10% of the expected target reference values shown in table below (2450MHz) below.

Table 9 Deviation from reference system verification values @ 2450MHz

Frequency and Date	Measured SAR 1g (mW/g)	Measured SAR 1g (Normalized to 1W)	SPEAG Calibration reference SAR Value 1g (mW/g)	Deviation From SPEAG Reference 1g (%)
2450MHz	14	56.00	60	-6.67

NOTE: All reference system verification values are referenced to 1W input power.

6.3.3 Liquid Depth 15cm

During the SAR measurement process the liquid level was maintained to a level of 15cm with a tolerance of 0.5cm.

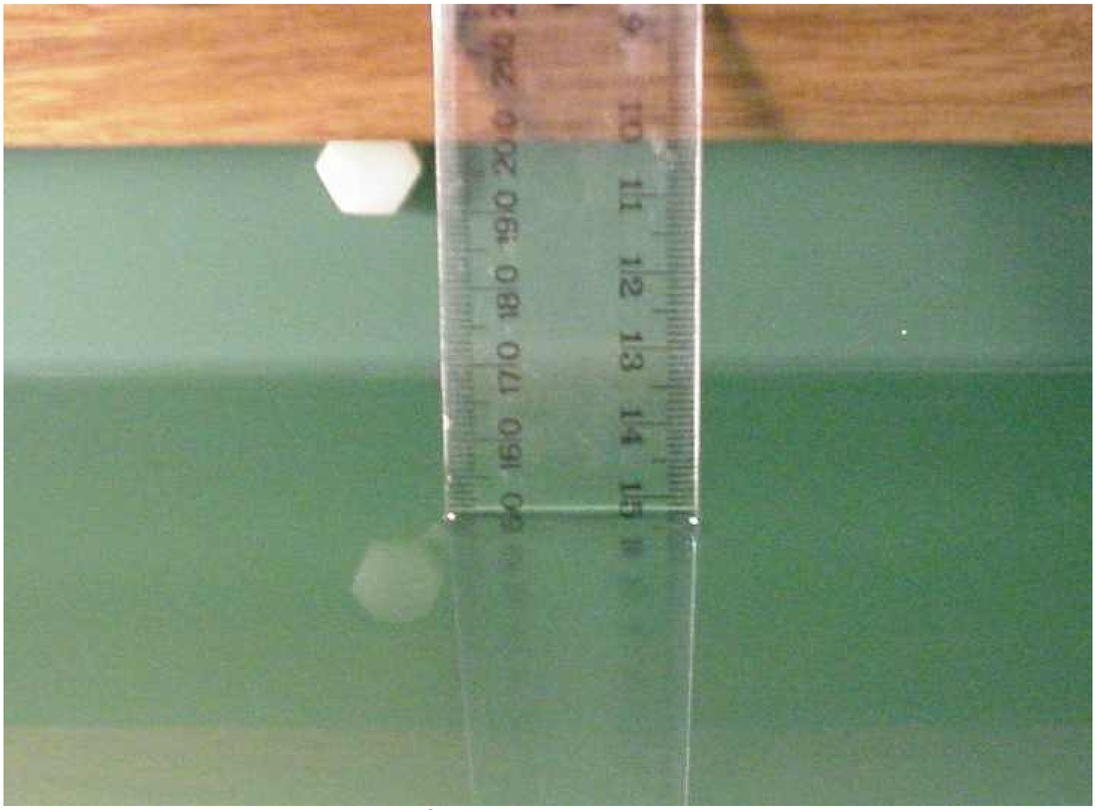


Photo of liquid Depth in Flat Phantom

6.4 Phantom Properties

The phantoms used during the testing comply with the OET65 C (01-01), IEEE 1528 and EN62209-1 and EN62209-2 SAR measurement requirements.

Phantom Properties	Required	Measured
Thickness of flat section	2.0mm ± 0.2mm (bottom section)	2.12-2.20mm
Dielectric Constant	<5.0	4.603 @ 300MHz (worst-case frequency)
Loss Tangent	<0.05	0.0379 @ 2500MHz (worst-case frequency)

6.5 Tissue Material Properties

The dielectric parameters of the human tissue simulating liquid were measured prior to SAR assessment using the HP85070A dielectric probe kit and HP8753ES Network Analyser. The actual dielectric parameters are shown in the following table.

Table 10 Measured Brain Simulating Liquid Dielectric Values for System Verifications

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
2450 MHz Body	52.1	39.2 ±5% (37.2 to 41.2)	1.98	1.80 ±5% (1.71 to 1.89)	1000

NOTE: The brain liquid parameters were within the required tolerances of ±5%.

Table 11 Measured Body Simulating Liquid Dielectric Values

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
2412 MHz Muscle	52.2	52.7 ±5% (50.1 to 55.3)	1.93	1.95 ±5% (1.85 to 2.05)	1000
2437 MHz Muscle	52.1	52.7 ±5% (50.1 to 55.3)	1.96	1.95 ±5% (1.85 to 2.05)	1000
2462 MHz Muscle	52.0	52.7 ±5% (50.1 to 55.3)	1.99	1.95 ±5% (1.85 to 2.05)	1000

NOTE: The liquid parameters were within the required tolerances of ±5%.

6.5.1 Liquid Temperature and Humidity

The humidity and dielectric/ambient temperatures were recorded during the assessment of the tissue material dielectric parameters. The difference between the ambient temperature of the liquid during the dielectric measurement and the temperature during tests was less than |2|°C.

Table 12 Temperature and Humidity recorded for each day

Date	Ambient Temperature (°C)	Liquid Temperature (°C)	Humidity (%)
7th September 2012	20.9	20.5	38

6.6 Simulated Tissue Composition Used for SAR Test

The tissue simulating liquids are created prior to the SAR evaluation and often require slight modification each day to obtain the correct dielectric parameters.

Table 13 Tissue Type: Muscle @ 2450MHz

Volume of Liquid: 60 Litres

Approximate Composition	% By Weight
Distilled Water	73.2
Salt	0.04
DGBE	26.7

*Refer "OET Bulletin 65 97/01 P38"

6.7 Device Holder for Laptops and P 10.1 Phantom

A low loss clamp was used to position the DUT underneath the phantom surface.

Refer to Appendix A for photographs of device positioning

7.0 SAR MEASUREMENT PROCEDURE USING DASY5

The SAR evaluation was performed with the SPEAG DASY5 system. A summary of the procedure follows:

a) A measurement of the SAR value at a fixed location is used as a reference value for assessing the power drop of the DUT. The SAR at this point is measured at the start of the test, and then again at the end of the test.

b) The SAR distribution at the exposed flat section of the flat phantom is measured at a distance of 4 mm from the inner surface of the shell. The area covers the entire dimension of the DUT and the horizontal grid spacing is 15 mm x 15 mm. The actual Area Scan has dimensions of 90mm x 120mm surrounding the test device. Based on this data, the area of the maximum absorption is determined by Spline interpolation.

c) Around this point, a volume of 30 mm x 30 mm x 30 mm is assessed by measuring 7 x 7 x 7 points. On the basis of this data set, the spatial peak SAR value is evaluated with the following procedure:

   (i) The data at the surface are extrapolated, since the centre of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 4 mm. The extrapolation is based on a least square algorithm. A polynomial of the fourth order is calculated through the points in z-axes. This polynomial is then used to evaluate the points between the surface and the probe tip.

   (ii) The maximum interpolated value is searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g and 10 g) are computed using the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot”- condition (in x, y and z-direction). The volume is integrated with the trapezoidal – algorithm. One thousand points (10 x 10 x 10) are interpolated to calculate the averages.

   (iii) All neighbouring volumes are evaluated until no neighbouring volume with a higher average value is found.

   (iv) The SAR value at the same location as in Step (a) is again measured to evaluate the actual power drift.

8.0 MEASUREMENT UNCERTAINTY

The uncertainty analysis is based on the template listed in the IEEE Std 1528-2003 for both device SAR tests and System verification uncertainty. The measurement uncertainty of a specific device is evaluated independently and the total uncertainty for both evaluations (95% confidence level) must be less than 30%.

Table 14 Uncertainty Budget for DASY5 Version 52 – DUT SAR test 2450MHz

Error Description	Uncert. Value	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i	10g u_i	v_i
Measurement System								
Probe Calibration	6	N	1.00	1	1	6.00	6.00	∞
Axial Isotropy	4.7	R	1.73	0.7	0.7	1.90	1.90	∞
Hemispherical Isotropy	9.6	R	1.73	0.7	0.7	3.88	3.88	∞
Boundary Effects	1	R	1.73	1	1	0.58	0.58	∞
Linearity	4.7	R	1.73	1	1	2.71	2.71	∞
System Detection Limits	1	R	1.73	1	1	0.58	0.58	∞
Readout Electronics	0.3	N	1.00	1	1	0.30	0.30	∞
Response Time	0.8	R	1.73	1	1	0.46	0.46	∞
Integration Time	2.6	R	1.73	1	1	1.50	1.50	∞
RF Ambient Noise	3	R	1.73	1	1	1.73	1.73	∞
RF Ambient Reflections	3	R	1.73	1	1	1.73	1.73	∞
Probe Positioner	0.4	R	1.73	1	1	0.23	0.23	∞
Probe Positioning	2.9	R	1.73	1	1	1.67	1.67	∞
Max. SAR Eval.	1	R	1.73	1	1	0.58	0.58	∞
Post Processing	2	R	1.73	1	1	1.15	1.15	∞
Test Sample Related								
Power Scaling	0	R	1.73	1	1	0.00	0.00	∞
Test Sample Positioning	2.9	N	1.00	1	1	2.90	2.90	145
Device Holder Uncertainty	3.6	N	1.00	1	1	3.60	3.60	5
Output Power Variation – SAR Drift Measurement	5.00	R	1.73	1	1	2.89	2.89	∞
Phantom and Setup								
Phantom Uncertainty	7.5	R	1.73	1	1	4.33	4.33	∞
Liquid Conductivity – Deviation from target values	5	R	1.73	0.64	0.43	1.85	1.24	∞
Liquid Permittivity – Deviation from target values	5	R	1.73	0.6	0.49	1.73	1.41	∞
Liquid Conductivity – Measurement uncertainty	2.5	N	1.00	0.64	0.71	1.60	1.78	∞
Liquid Permittivity – Measurement uncertainty	2.5	N	1.00	0.6	0.26	1.50	0.65	∞
Temp.unc. - Conductivity	1.7	R	1.73	0.78	0.71	0.77	0.70	∞
Temp. unc. - Permittivity	0.3	R	1.73	0.23	0.26	0.04	0.05	∞
Combined standard Uncertainty (u_c)						11.7	11.5	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k= 2			23.3	23.0	

Estimated total measurement uncertainty for the DASY5 measurement system was ±11.7%. The extended uncertainty (K = 2) was assessed to be ±23.3% based on 95% confidence level. The uncertainty is not added to the measurement result.

Table 15 Uncertainty Budget for DASY5 Version 52 – System Verification 2450MHz

Error Description	Uncert. Value	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i	10g u_i	v_i
Measurement System								
Probe Calibration	6.55	N	1.00	1	1	6.55	6.55	∞
Axial Isotropy	4.7	R	1.73	1	1	2.71	2.71	∞
Hemispherical Isotropy	9.6	R	1.73	0	0	0.00	0.00	∞
Boundary Effects	1	R	1.73	1	1	0.58	0.58	∞
Linearity	4.7	R	1.73	1	1	2.71	2.71	∞
System Detection Limits	1	R	1.73	1	1	0.58	0.58	∞
Readout Electronics	0.3	N	1.00	1	1	0.30	0.30	∞
Response Time	0	R	1.73	1	1	0.00	0.00	∞
Integration Time	0	R	1.73	1	1	0.00	0.00	∞
RF Ambient Noise	1	R	1.73	1	1	0.58	0.58	∞
RF Ambient Reflections	1	R	1.73	1	1	0.58	0.58	∞
Probe Positioner	0.8	R	1.73	1	1	0.46	0.46	∞
Probe Positioning	6.7	R	1.73	1	1	3.87	3.87	∞
Max. SAR Eval.	2	R	1.73	1	1	1.15	1.15	∞
Post Processing	2	R	1.73	1	1	1.15	1.15	∞
Dipole Related								
Deviation of exp. dipole	5.5	R	1.73	1	1	3.18	3.18	∞
Dipole Axis to Liquid Dist.	2	R	1.73	1	1	1.15	1.15	∞
Input power & SAR drift	5.00	R	1.73	1	1	2.89	2.89	∞
Phantom and Setup								
Phantom Uncertainty	4	R	1.73	1	1	2.31	2.31	∞
Liquid Conductivity – Deviation from target values	5	R	1.73	0.64	0.43	1.85	1.24	∞
Liquid Permittivity – Deviation from target values	5	R	1.73	0.6	0.49	1.73	1.41	∞
Liquid Conductivity – Measurement uncertainty	2.5	N	1.00	0.78	0.71	1.95	1.78	∞
Liquid Permittivity – Measurement uncertainty	2.5	N	1.00	0.26	0.26	0.65	0.65	∞
Temp.unc. - Conductivity	1.7	R	1.73	0.78	0.71	0.77	0.70	∞
Temp. unc. - Permittivity	0.3	R	1.73	0.23	0.26	0.04	0.05	∞
Combined standard Uncertainty (u_c)						10.6	10.5	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=	2		21.3	20.9	

Estimated total measurement uncertainty for the DASY5 measurement system was ±10.6%. The extended uncertainty (K = 2) was assessed to be ±21.3% based on 95% confidence level. The uncertainty is not added to the System verification measurement result.

9.0 EQUIPMENT LIST AND CALIBRATION DETAILS

Table 16 SPEAG DASY5 Version 52

Equipment Type	Manufacturer	Model Number	Serial Number	Calibration Due	Used For this Test?
Robot - Six Axes	Staubli	RX90BL	N/A	Not applicable	✓
Robot Remote Control	SPEAG	CS7MB	RX90B	Not applicable	✓
SAM Phantom	SPEAG	N/A	1260	Not applicable	
SAM Phantom	SPEAG	N/A	1060	Not applicable	
Flat Phantom	AndreT	10.1	P 10.1	Not Applicable	✓
Flat Phantom	AndreT	9.1	P 9.1	Not Applicable	
Flat Phantom	SPEAG	ELI 4.0	1101	Not Applicable	
Data Acquisition Electronics	SPEAG	DAE3 V1	359	21-June-2013	
Data Acquisition Electronics	SPEAG	DAE3 V1	442	05-Dec-2012	✓
Probe E-Field - Dummy	SPEAG	DP1	N/A	Not applicable	
Probe E-Field	SPEAG	ET3DV6	1380	12-Dec-2012	✓
Probe E-Field	SPEAG	ET3DV6	1377	20-June-2013	
Probe E-Field	SPEAG	ES3DV6	3029	Not Used	
Probe E-Field	SPEAG	EX3DV4	3563	21-June-2013	
Probe E-Field	SPEAG	EX3DV4	3657	14-Dec-2012	
Antenna Dipole 300 MHz	SPEAG	D300V3	1012	30-Nov-2012	
Antenna Dipole 450 MHz	SPEAG	D450V3	1074	30-Nov-2012	
Antenna Dipole 750 MHz	SPEAG	D750V2	1051	9-Jan-2014	
Antenna Dipole 900 MHz	SPEAG	D900V2	047	22-June-2014	
Antenna Dipole 1640 MHz	SPEAG	D1640V2	314	20-June-2014	
Antenna Dipole 1800 MHz	SPEAG	D1800V2	242	20-June-2014	
Antenna Dipole 1950 MHz	SPEAG	D1950V3	1113	10-Dec -2012	
Antenna Dipole 2450 MHz	SPEAG	D2450V2	724	09-Dec-2012	✓
Antenna Dipole 2600 MHz	SPEAG	D2600V2	1044	10-Jan-2014	
Antenna Dipole 3500 MHz	SPEAG	D3500V2	1002	13-July-2013	
Antenna Dipole 5600 MHz	SPEAG	D5GHzV2	1008	14-Dec-2013	
RF Amplifier	EIN	603L	N/A	*In test	
RF Amplifier	Mini-Circuits	ZHL-42	N/A	*In test	✓
RF Amplifier	Mini-Circuits	ZVE-8G	N/A	*In test	
Synthesized signal generator	Hewlett Packard	ESG-D3000A	GB37420238	*In test	✓
RF Power Meter	Hewlett Packard	437B	3125012786	30-Aug-2013	
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481H	1545A01634	03-Sept-2013	
RF Power Meter	Rohde & Schwarz	NRP	101415	21-Sept-2012	✓
RF Power Sensor	Rohde & Schwarz	NRP - Z81	100174	21-Sept-2012	✓
RF Power Meter Dual	Hewlett Packard	435A	1733A05847	*In test	✓
RF Power Sensor	Hewlett Packard	8482A	2349A10114	*In test	✓
Network Analyser	Hewlett Packard	8714B	GB3510035	27-Sept-2012	
Network Analyser	Hewlett Packard	8753ES	JP39240130	7-Nov-2012	✓
Dual Directional Coupler	Hewlett Packard	778D	1144 04700	*In test	
Dual Directional Coupler	NARDA	3022	75453	*In test	✓
Radio Communication Test Set	Rohde & Schwarz	CMU200	101573	Not Applicable	
Radio Communication Test Set	Anritsu	MT8820A	6200240559	Not Applicable	
Radio Communication Test Set	Agilent	PXT E6621A	MY51100168	Not Applicable	

* Calibrated during the test for the relevant parameters.

10.0 TEST METHODOLOGY

Notebooks should be evaluated in normal use positions, typical for lap-held bottom-face only. However the number of positions will depend on the number of configurations the laptop can be operated in. The “STYLISTIC T SERIES” can be used in either a conventional laptop position (see Appendix A) or a Tablet configuration. The antenna location in the “STYLISTIC T SERIES” is closest to the top of the screen when used in a conventional laptop configuration and due to the separation distances involved between the phantom and the laptop antenna, testing is not required in this position.

10.1 Positions

10.1.1 “Lap Held” Position Definition (0mm spacing)

The DUT was tested in the 2.00 mm flat section of the AndreT Flat phantom for the “Lap Held” position. The Transceiver was placed at the bottom of the phantom and suspended in such way that the back of the DUT was touching the phantom. This device orientation simulates the PC’s normal use – being held on the lap of the user. A spacing of 0mm ensures that the SAR results are conservative and represent a worst-case position.

10.1.2 “Edge On” Position (Portrait or Landscape)

The DUT was tested in the (2.00 mm) flat section of the AndreT Flat phantom for the “Edge On” position. The Antenna edge of the Transceiver was placed underneath the flat section of the phantom and suspended until the edge touched the phantom. *Refer to Appendix A for photos of measurement positions.*

10.1.3 “Bystander” Position (25mm spacing)

The DUT was tested in the 2.00 mm flat section of the AndreT Flat phantom for the “Bystander” position. The Transceiver was placed at the bottom of the phantom and suspended in such way that the back of its LCD screen was parallel to phantom and at 25mm distance. This orientation simulates use of the device in a way that allows occasional RF exposure of the nearby person (Bystander).

10.2 List of All Test Cases (Antenna In/Out, Test Frequencies, User Modes)

The DUT has a fixed antenna. Depending on the measured SAR level up to three test channels with the test sample operating at maximum power were recorded. The following table represents the matrix used to determine what testing was required. All relevant provisions of KDB 447498 are applied for SAR measurements of the host system.

Table 17 Testing configurations

Phantom Configuration	*Device Mode	Antenna	Test Configurations		
			Channel (Low)	Channel (Middle)	Channel (High)
Lap Held	DSSS 2.4GHz	A		X	
		B		X	
Bystander	DSSS 2.4GHz	A		X	
		B		X	
Edge On	DSSS 2.4GHz	A		X	
		B		X	

Legend

X (blue)	Testing Required in this configuration
(green)	Testing required in this configuration only if SAR of middle channel is more than 3dB below the SAR limit or it is the worst case.

NOTE: Throughout this report, Antenna A and B refer to Tx1 and Tx2 in the host respectively.

11.0 SAR MEASUREMENT RESULTS

The SAR values averaged over 1g tissue masses were determined for the sample DUT for all test configurations listed in section 10.2.

11.1 2450MHz SAR Results

There are two modes of operation within the 2450MHz band, they include OFDM and DSSS modulations. Refer to section 10.2 for selection of all device test configurations. Table below displays the SAR results.

Table 18 SAR MEASUREMENT RESULTS – DSSS Mode

Test Position	Plot No.	Ant	Bit rate Mode (Mbps)	Channel Bandwidth (MHz)	Test Channel	Test Freq (MHz)	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Lap Held	-	A	1	-	06	2437	Noise Floor	-
Lap Held	-	B	1	-	06	2437	Noise Floor	-
Edge On Secondary Landscape	1	A	1	-	01	2412	0.394	-0.06
	2	A	1	-	06	2437	0.348	-0.06
	3	A	1	-	11	2462	**0.427**	0.02
	4	B	1	-	06	2437	0.270	0.21
Edge On Primary Portrait	5	B	1	-	06	2437	0.171	-0.07
Edge On Secondary Portrait	-	A	1	-	06	2437	Noise Floor	-
Bystander	-	A	1	-	06	2437	Noise Floor	-
Bystander	6	B	1	-	06	2437	0.054	0.06

NOTE: The measurement uncertainty of 23.3% for 2.45GHz was not added to the result.

The highest SAR level recorded in the 2450MHz band was 0.427 mW/g as evaluated in a 1g cube of averaging mass. This value was obtained in the Edge On Secondary Landscape position in DSSS mode, utilizing channel 11 (2462 MHz) and antenna A.

12.0 COMPLIANCE STATEMENT

The Fujitsu TABLET PC, Model: T732 / TH702 with ATHEROS Mini-PCI Wireless LAN Module (HB116 802.11a/b/g/n), Model: AR5BHB116 was found to comply with the FCC and RSS-102 SAR requirements.

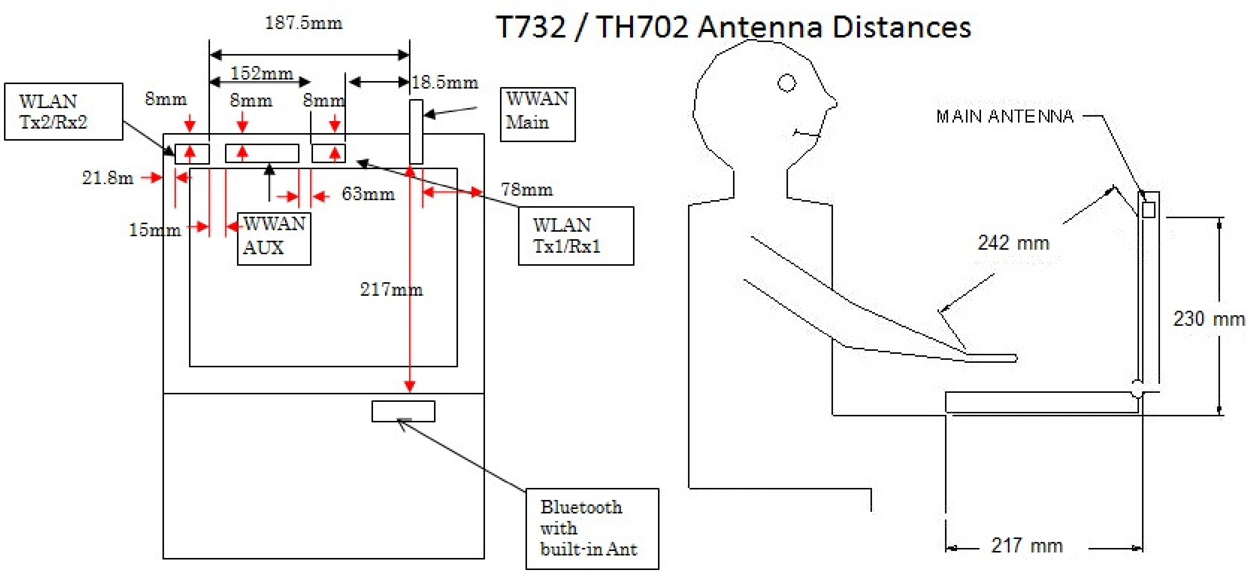
The highest SAR level recorded was 0.427 mW/g for a 1g cube. This value was measured at 2462 MHz (channel 11) in the "Edge On Secondary Landscape" position in DSSS modulation mode at the antenna A. This was below the limit of 1.6 mW/g for uncontrolled exposure, even taking into account the measurement uncertainty of 23.3 %.

13.0 MULTIBAND EVALUATION CONSIDERATIONS

According to the FCC SAR evaluation procedures mentioned in **KDB 616217**, stand-alone SAR evaluation is NOT required when the maximum transmitter and antenna output power is less than or equal to $60/f_{(GHz)}$ (P_{ref}) The Bluetooth module in the DUT operates in the 2.4GHz range. It has a maximum output power of 5mW which is < P_{ref} (=60/2.4=25mW).

The shortest distance between the BT module and any other transmitting antenna was more than 21.7cm. Because 21.7cm > 5cm, and 5mW < 25mW, the Bluetooth module was not considered for SAR evaluation. This is in accordance with the test reduction methods detailed in KDB 616217 and KDB 447498

Diagram Showing Antenna Positions



NOTE: Throughout this report, Antenna A and B refer to Tx1 and Tx2 in the host.