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SAR Test Report

Report Number: M100218R_FCC_Gobi2000_SAR_GSM-UMTS

Replacement for

M100218_FCC_GOBI2000_SAR_GSM-UMTS

Test Sample:	Portable Tablet Computer with Intel or Atheros WLAN Modules
Radio Modules Under Test:	WWAN Gobi2000
Host PC Model:	T730 / TH700
WWAN FCC ID:	N7NGOBI2
WWAN IC:	2417C-GOBI2
Date of Issue:	20th May 2010

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SAR TEST REPORT
Report Number: M100218 _FCC_Gobi2000 _SAR_GSM-UMTS
WWAN FCC ID: N7NGOBI2 IC: 2417C-GOBI2

1.0 GENERAL INFORMATION

Table 1

Test Sample:	Portable Tablet Computer with Intel or Atheros WLAN Modules
Radio Module Under Test:	WWAN Gobi2000
Interface Type:	Mini-PCI Module
Device Category:	Portable Transmitter
Test Device:	Pre-Production Unit
Host PC model:	T730 / TH700
WWAN FCC ID:	N7NGOBI2
WWAN IC:	2417C-GOBI2
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 Issue 4 March 2010
Statement Of Compliance:	The Fujitsu Tablet Computer T730 / TH700 with Sierra Wireless GSM/UMTS Module Gobi2000 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 Dates:	9th to 20th May 2010

Test Officer:

Peter Jakubiec

Authorised Signature:

Peter Jakubiec

SAR TEST REPORT
Portable Tablet Computer
Model: T730 / TH700
Report Number: M100218 _FCC_Gobi2000 _SAR_GSM-UMTS

2.0 INTRODUCTION

Testing was performed on the Fujitsu Tablet PC, Model: T730 / TH700 with SIERRA Mini-PCI Wireless WAN Module, Model: Gobi2000. The SIERRA WIRELESS module is an OEM product. The Mini-PCI Wireless WAN (WWAN) was tested in the dedicated host – LifeBook T series, Model T730 / TH700 with Intel or Atheros WLAN modules.

3.0 TEST SAMPLE TECHNICAL INFORMATION

(Information supplied by the client)

3.1 WWAN Details

Table 2

Transmitter:	Mini-Card UMTS Module
Wireless Module:	UMTS
Model Number:	Gobi2000
Manufacturer:	Sierra Wireless
GSM Frequency Bands:	850 / 900 / 1800 / 1900 MHz
UMTS Frequency Bands:	Band I(2100MHz) / Band II(1900MHz) / Band V(850MHz) / Band VIII(900 MHz)
Features:	EGPRS, GPRS, UMTS and HSDPA, and HSUPA
Output Power:	**GPRS:** 850 MHz = 33 dBm and 1900 MHz = 30 dBm **EGPRS**: 850 MHz = 27 dBm and 1900 MHz = 26 dBm **UMTS**: 850 MHz and 1900 MHz bands = 24 dBm
Antenna Type:	Nissei Electric
Antenna Gain:	Max peak gain - 018 dBi (Tx)

3.1.1 Test Signal, Frequency and Output Power

The EUT was provided by Fujitsu Australia Pty Ltd. It was put into operation using a Rhodes & Schwarz Radio Communication Tester CMU200. The channels utilised in the measurements were the traffic channels shown in the table below. The power level was set to Class 4 for 850 MHz and Class 1 for 1900 MHz GSM bands and class 3 for 850 and 1900 MHz UMTS bands.

Channels and Output power:

Table 3

Channel and Mode	Frequency MHz	Average Output Power dBm
GPRS Mode		
Channels 128, 190 and 251	824.2, 836.6 and 848.8	33
Channels 512, 661 and 810	1850.2, 1880 and1909.8	30
UMTS Mode		
Channels 4132, 4183 and 4233	826.4, 836.6 and 846.6	24
Channels 9262, 9400 and 9538	1852.4, 1880 and 1907.6	24

3.3 EUT (Notebook PC) Details

Table 4

Host notebook :	LifeBook T series
***Model Name:**	T730 / TH700
Serial Number:	Pre-production Sample
Manufacturer:	FUJITSU LIMITED
CPU Type and Speed:	Core i7-620M 2.66GHz
LCD	12.1"WXGA
Wired LAN:	Intel 82577LM/82577LC: 10 Base-T/100 Base-TX/1000Base-T
Modem:	None
Port Replicator Model:	FPCPR94
AC Adapter Model:	80W: SEE100P2-19.0(Sanken), ADP-80NB A(Delta)
Voltage:	19V
Current Specs:	4.22A
Watts:	80W

Host System # 1** :	FCC Granted HOST PC FCC ID: EJE-WB0081 , IC ID: 337J-WB0081 and FCC ID: EJE-WL0021, IC ID: 337J-WL0021
Radio Module # 1:	WLAN Puma Peak (802.11a/b/g/n)
WLAN Model Number:	WLAN Radio 622ANHMW
WLAN Manufacturer:	Intel Corp.
Interface Type:	Half Mini-Card Wireless LAN Module
Radio Module # 2:	Bluetooth module
Model Number:	BSMAN3
Manufacturer:	TAIYO YUDEN
Interface Type:	USB

Host System # 2 :	FCC Granted HOST PC FCC ID: PPD-AR5B97-F , IC ID: 4104A-AR5B97
Radio Module # 2:	WLAN HB97 (802.11b/g/n)
WLAN Model Number:	AR5B97
WLAN Manufacturer:	Atheros Corp.
Interface Type:	Half Mini-Card Wireless LAN Module
Radio Module # 2:	Bluetooth module
Model Number:	BSMAN3
Manufacturer:	TAIYO YUDEN
Interface Type:	USB

*The model numbers shown T730 and TH700 are for the same product.
The T730 is for commercial market (there is Port-Replicator as option).
The TH700 is for consumer market (there is no Port-Replicator).
**The difference between these two samples is the low power Bluetooth module. The EJE-WB0081 has the BT module and the EJE-WL0021 does not have the BT module.

3.4 Test sample Accessories

3.4.1 Battery Types

One type of Fujitsu Lithium Ion Battery is used to power the Portable Tablet Computer with Wireless WAN Model: Gobi2000. SAR measurements were performed with the battery as shown below.

Standard Battery

Table 5

Battery #1		**Battery #2**	
Product No.	FPCBP215	Product No.	FPCBP215
V/mAh	10.8V/5800mAh	V/mAh	10.8V/5800mAh
Serial No.	01A-Z091109000178Z	Serial No.	01A-Z091109000279Z

4.0 TEST SIGNAL, FREQUENCY AND OUTPUT POWER

The Portable Tablet Computer Wireless WAN had a total of 423 channels (USA model) within the 824.2 to 848.8 MHz and 1850.2 to 1909.8 MHz GPRS frequency bands and 379 channels within the frequency ranges 826.4 to 846.6 MHz and 1852.4 to 1907.6 MHz. For the SAR measurements the device was operating at full transmit power. The fixed frequency channels used in the testing are shown in Table Below.

The frequency span of the GSM and UMTS bands was more than 10MHz consequently; the SAR levels of the test sample were measured for lowest, centre and highest channels in the applicable modes. There were no wires or other connections to the Portable Tablet Computer during the SAR measurements.

At the beginning and at the completion 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 results of this measurement are listed in table below. Maximum burst-averaged output power for each mode (GPRS/EDGE) and the corresponding multi-slot class were obtained and listed in this section.

Table: Frequency and Conducted Power Results GSM

Table 6

Coding Scheme	GPRS Multislot Class	RF Channel	Measured Power (dBm)
CS1	10	128	**32.05**
CS1	10	190	**32.39**
CS1	10	251	**31.95**
CS1	11	128	**N/A**
CS1	11	190	**N/A**
CS1	11	251	**N/A**
CS1	12	128	**N/A**
CS1	12	190	**N/A**
CS1	12	251	**N/A**

Table 7

Coding Scheme	EGPRS Multislot Class	RF Channel	Measured Power (dBm)
MCS5	10	128	**27.96**
MCS5	10	190	**28.35**
MCS5	10	251	**27.81**
MCS5	11	128	**N/A**
MCS5	11	190	**N/A**
MCS5	11	251	**N/A**
MCS5	12	128	**N/A**
MCS5	12	190	**N/A**
MCS5	12	251	**N/A**

Table 8

Coding Scheme	GPRS Multislot Class	RF Channel	Measured Power (dBm)
CS1	10	512	**29.85**
CS1	10	661	**29.30**
CS1	10	810	**27.89**
CS1	11	512	**N/A**
CS1	11	661	**N/A**
CS1	11	810	**N/A**
CS1	12	512	**N/A**
CS1	12	661	**N/A**
CS1	12	810	**N/A**

Table 9

Coding Scheme	EGPRS Multislot Class	RF Channel	Measured Power (dBm)
MCS5	10	512	**26.53**
MCS5	10	661	**26.10**
MCS5	10	810	**24.76**
MCS5	11	512	**N/A**
MCS5	11	661	**N/A**
MCS5	11	810	**N/A**
MCS5	12	512	**N/A**
MCS5	12	661	**N/A**
MCS5	12	810	**N/A**

Conducted Power Measurement UMTS 850 MHz

Configuration:
12.2 kbps RMC
Test Loop Mode 1
βc = 8, βd = 15 (3GPP default)
TPC (Transmit Power Control) = All 1s

Table 10

Channel No.	βc	βd	Result (dBm)
4132	8	15	24.41
4183	8	15	24.46
4233	8	15	24.44

Conducted Power Measurement UMTS + HSDPA 850 MHz

Configuration:
Device HSDPA Category 6 (Downlink 3.6 Mbps and Uplink 384 kbps)
H-Set = 1
QPSK in H-Set (1)
CQI Fidback Cycle = 4ms; CQI Repetition Rate = 2ms; ACK-NACK repetition factor = 3

Table 11

Sub Test No.	βc	βd	ΔAKN	ΔNAKN	ΔCQI	Result (dBm)		
						4132	4183	4233
1	2	15	8	8	8	24.07	24.03	23.93
2	12	15	8	8	8	23.37	23.46	23.29
3	15	8	8	8	8	23.37	23.48	23.26
4	15	4	8	8	8	23.42	23.43	23.29

Conducted Power Measurement UMTS + HSDPA + HSUPA 850 MHz

Configuration:
Device HSUPA Release 6 (5.7 Mbps)
RMC 12.2 kbps + HSPA 34.108 with loop mode 1
HS-DPCCH, E-DPCCH, E-DPDCH Enabled
Power Control – TPC algorithm 2
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2
E-TFCI table index = 0
E-DCH minimum set E-TFCI = 9
PLnon-max = 0.84
Max. number channelisation codes = 2xsf4
Initial Serving Grant Value = Off
Δ HARQ =0
Number of Ref.E-TFCIs – Subtests 1,2,4,5 = 5; Subtest 3 = 2
Set1 Patern Type = Closed Loop

Table 12

Sub Test No.	βc	βd	Δ AKN	Δ NAKN	Δ CQI	Δ E-DPCCH	AG Index	Result (dBm)		
								4132	4183	4233
1	11	15	8	8	8	6	20	23.62	23.51	23.25
2	6	15	8	8	8	8	12	21.54	21.46	21.34
3	15	9	8	8	8	8	15	22.16	22.25	22.27
4	2	15	8	8	8	5	17	21.76	21.56	21.53
5	15	15	8	8	8	7	21	23.88	23.21	23.20

Conducted Power Measurement UMTS 1900 MHz

Configuration:
12.2 kbps RMC
Test Loop Mode 1
βc = 8, βd = 15 (3GPP default)
TPC (Transmit Power Control) = All 1s

Table 13

Channel No.	βc	βd	Result (dBm)
9262	8	15	24.51
9400	8	15	24.71
9538	8	15	24.11

Conducted Power Measurement UMTS + HSDPA 1900 MHz

Configuration:
Device HSDPA Category 6 (Downlink 3.6 Mbps and Uplink 384 kbps)
H-Set = 1
QPSK in H-Set (1)
CQI Fidback Cycle = 4ms; CQI Repetition Rate = 2ms; ACK-NACK repetition factor = 3

Table 14

Sub Test No.	βc	βd	ΔACKN	ΔNACKN	ΔCQI	Result (dBm)		
						9262	9400	9538
1	2	15	8	8	8	24.33	24.63	23.94
2	12	15	8	8	8	23.75	23.96	23.34
3	15	8	8	8	8	23.81	24.13	23.48
4	15	4	8	8	8	23.79	24.02	23.45

Conducted Power Measurement UMTS + HSDPA + HSUPA 1900 MHz

Configuration:
Device HSUPA Release 6 (5.7 Mbps)
HS-DPCCH, E-DPCCH, E-DPDCH Enabled
Power Control – TPC algorithm 2
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2
E-TFCI table index = 0
E-DCH minimum set E-TFCI = 9
PLnon-max = 0.84
Max. number channelisation codes = 2xsf4
Initial Serving Grant Value = Off
Δ HARQ =0
Number of Ref.E-TFCIs – Subtests 1,2,4,5 = 5; Subtest 3 = 2
Set1 Patern Type = Closed Loop

Table 15

Sub Test No.	βc	βd	Δ AKN	Δ NAKN	Δ CQI	Δ E-DPCCH	AG Index	Result (dBm)		
								9262	9400	9538
1	11	15	8	8	8	6	20	23.04	22.92	23.33
2	6	15	8	8	8	8	12	21.02	21.01	21.42
3	15	9	8	8	8	8	15	21.59	21.79	22.25
4	2	15	8	8	8	5	17	21.25	21.38	21.63
5	15	15	8	8	8	7	21	22.78	22.59	23.18

4.1 Battery Status

The device battery was fully charged prior to commencement of measurement. Each stand-alone SAR test was completed within 30 minutes. Volume scans for the co-transmission SAR tests took longer than 30mins. 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. Conducted power measurements were not performed at the beginning and end of each scan due to lack of a suitable external antenna port. The uncertainty associated with the power drift was less than 12% and was assessed in the uncertainty budget.

5.0 DETAILS OF TEST LABORATORY

5.1 Location

EMC Technologies Pty Ltd
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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 16

AS/NZS 2772.1:	RF and microwave radiation hazard measurement
ACA:	Radio communications (Electromagnetic Radiation - Human Exposure) Standard 2003
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)
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 in the range 51% to 61%. 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 DASY4 SAR measurement system using the SN3563 and SN1380 probes was less than 5μV in both air and liquid mediums.

6.0 DESCRIPTION OF SAR MEASUREMENT SYSTEM

Table 17

Applicable Head Configurations	: None
Applicable Body Configurations	: Tablet Position
	: Edge On Position

6.1 Probe Positioning System

The measurements were performed with the state-of-the-art automated near-field scanning system **DASY4 V4.7 Build 53** from Schmid & Partner Engineering AG (SPEAG). The DASY4 fully complies with the OET65 C (01-01), IEEE 1528 and EN62209-1 SAR measurement requirements.

6.2 E-Field Probe Type and Performance

The SAR measurements were conducted with SPEAG dosimetric probes ET3DV6 Serial: 1380 (GSM and 3G measurements) and EX3DV4 Serial: 3563 (Multiband Evaluations). Please refer to appendix C for detailed information.

6.4 System Verification

6.4.1 System Verification Results (900 MHz, 1950 MHz, 2450 MHz and 5GHz)

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.

System Verification Results

Table 18

1. System Verification Date & Frequency	2. ∈r (measured)	3. σ (mho/m) (measured)	5. Measured SAR 1g (mW/g)	6. Measured SAR 10g (mW/g)
9th March 2010 900 MHz Probe SN:1380	39.9	0.94	2.78	1.78
10th March 2010 1950 MHz Probe SN:1380	38.7	1.46	10.4	5.31
11th March 2010 1950 MHz Probe SN:1380	40.3	1.46	10.7	5.47
12th March 2010 900 MHz Probe SN:1380	40.6	0.95	2.81	1.81
15th March 2010 1950 MHz Probe SN:3563	39.3	1.45	10.9	5.50
15th March 2010 2450 MHz Probe SN:3563	39.6	1.86	13.8	6.42
9th May 2010 5200 MHz Probe SN:3563	45.8	5.04	8.30	2.34
9th May 2010 5500 MHz Probe SN:3563	45.0	5.54	8.58	2.39
9th May 2010 5800 MHz Probe SN:3563	44.2	6.02	8.69	2.43
14th May 2010 900 MHz Probe SN:3563	39.7	0.93	2.70	1.73
14th May 2010 1950 MHz Probe SN:3563	38.3	1.46	10.9	5.52
14th May 2010 5500 MHz Probe SN:3563	46.2	5.82	8.70	2.47
20th March 2010 2450 MHz Probe SN:1380	38.6	1.88	12.8	6.01

6.4.2 Deviation from reference system verification values

The reference SAR values are derived using a reference dipole and flat section of the SAM phantom suitable for a centre frequency of 900, 1950 MHz and 2450 MHz. These reference SAR values are obtained from the IEEE Std 1528-2003 and are normalized to 1W.
The SPEAG calibration reference SAR value is the SAR system verification result obtained in a specific dielectric liquid using the system verification dipole during calibration. The measured one-gram SAR should be within 10% of the expected target reference values shown in table below.
The reference SAR value for 5 GHz band is the SAR system verification result obtained in a specific dielectric liquid (body liquid) using the system verification dipole (D5GHzV2) after system component calibration. The measured one-gram SAR should be within 10% of the expected target reference values shown in table below.

Deviation from reference system verification values @ (900MHz, 1950 MHz, 2450MHz and 5GHz)

Table 19

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 (%)	IEEE Std 1528 reference SAR value 1g (mW/g)	Deviation From IEEE 1g (%)
9th March 10 900 MHz Probe SN:1380	2.78	11.12	10.9	2.02	10.8	2.96
10th March 10 1950 MHz Probe SN:1380	10.4	41.60	41.3	0.73	40.5	2.72
11th March 10 1950 MHz Probe SN:1380	10.7	42.80	41.3	3.63	40.5	5.68
12th March 10 900 MHz Probe SN:1380	2.81	11.24	10.9	3.12	10.8	4.07
15th March 10 1950 MHz Probe SN:3563	10.9	43.60	41.3	5.57	40.5	7.65
15th March 10 2450 MHz Probe SN:3563	13.8	55.20	52	6.15	52.4	5.34
9th May 2010 5200 MHz Probe SN:3563	8.30	83.00	87.7	-5.36	-	-
9th May 2010 5500 MHz Probe SN:3563	8.58	85.80	92.9	-7.64	-	-
9th May 2010 5800 MHz Probe SN:3563	8.69	86.90	95.6	-9.10	-	-
14th May 2010 900 MHz Probe SN:3563	2.70	10.80	10.9	-0.92	10.8	0.00
14th May 2010 1950 MHz Probe SN:3563	10.9	43.60	41.3	5.57	40.5	7.65
14th May 2010 5500 MHz Probe SN:3563	8.70	87.00	92.9	-6.35	-	-
20th March 2010 2450 MHz Probe SN:1380	12.8	51.20	52	-1.54	52.4	-2.29

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

6.4.3 Liquid Depth 15cm

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

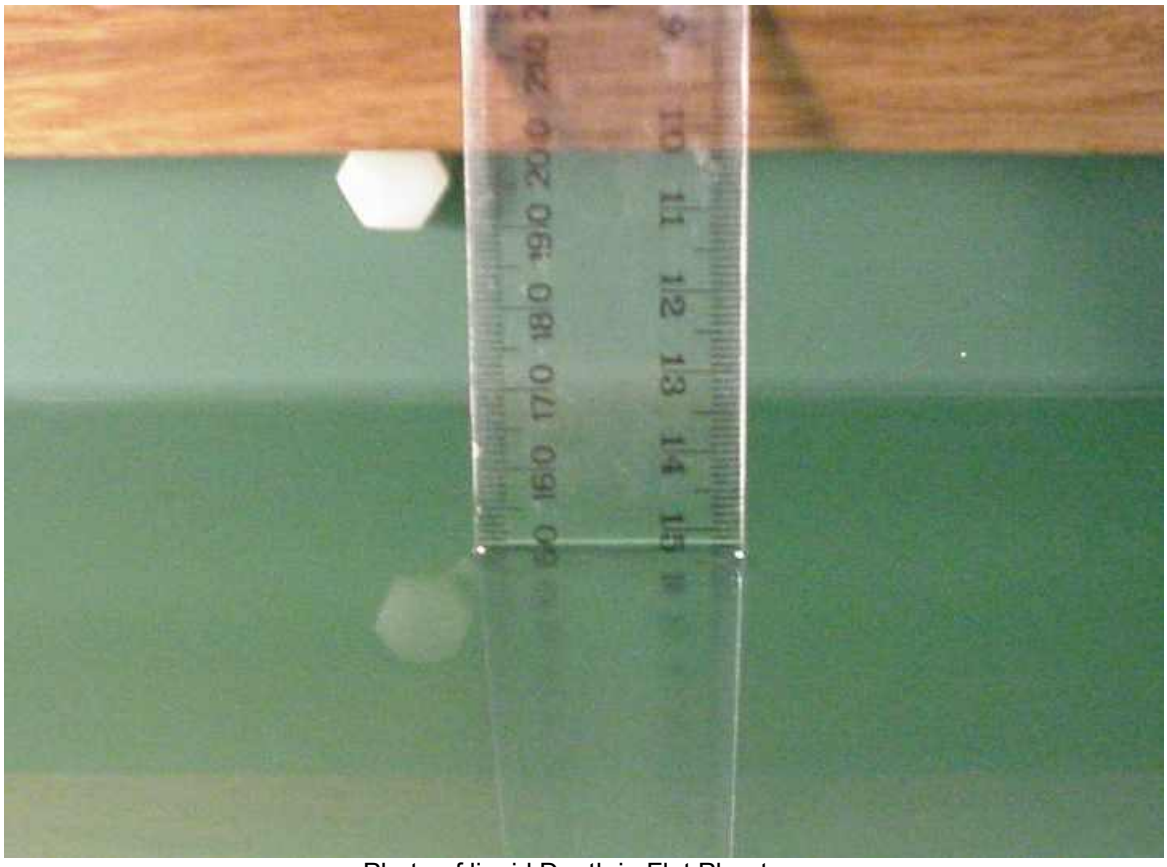


Photo of liquid Depth in Flat Phantom

6.5 Phantom Properties

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

6.6 Tissue Material Properties

The dielectric parameters of the brain 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.

Measured Brain and Body Simulating Liquid Dielectric Values for System Verifications

Table 20

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
900 MHz Brain	39.9 – 40.6	41.5 ±5% (39.4 to 43.6)	0.94 – 0.95	0.97 ±5% (0.92 to 1.02)	1000
1950 MHz Brain	40.3 – 41.0	40.0 ±5% (38.0 to 42.0)	1.46 – 1.47	1.40 ±5% (1.33 to 1.47)	1000
5500 MHz Body	46.2	48.2 ±10% (43.38 to 53.02)	5.82	6.0 ±5% (5.7 to 6.3)	1000
2450 MHz Brain	38.6 - 39.6	39.2 ±5% (37.2 to 41.2)	1.86 – 1.88	1.80 ±5% (1.71 to 1.89)	1000

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

Measured Body Simulating Liquid Dielectric Values at 850MHz

Table 21

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
825 MHz Body	52.8 – 53.1	55.2 ±5% (52.4 to 58.0)	0.98	0.97 ±5% (0.92 to 1.02)	1000
835 MHz Body	52.7 - 53.0	55.2 ±5% (52.4 to 58.0)	0.99	0.97 ±5% (0.92 to 1.02)	1000
850 MHz Body	52.6 - 52.7	55.2 ±5% (52.4 to 58.0)	1.00	0.97 ±5% (0.92 to 1.02)	1000

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

Measured Body Simulating Liquid Dielectric Values at 1880MHz

Table 22

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
1850 MHz Body	50.8 – 55.1	53.3 ±5% (50.6 to 56.0)	1.53 - 1.58	1.52 ±5% (1.44 to 1.60)	1000
1880.0 MHz Body	51.0 – 51.7	53.3 ±5% (50.6 to 56.0)	1.56	1.52 ±5% (1.44 to 1.60)	1000
1910 MHz Body	50.9 - 51.6	53.3 ±5% (50.6 to 56.0)	1.57 - 1.58	1.52 ±5% (1.44 to 1.60)	1000

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

Measured Body Simulating Liquid Dielectric Values at 5500MHz

Table 23

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
5500 MHz Body	46.2	48.2 ±10% (43.38 to 53.02)	5.82	6.0 ±5% (5.7 to 6.3)	1000

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

Measured Body Simulating Liquid Dielectric Values at 2450MHz

Table 24

Frequency Band	∈r (measured range)	∈r (target)	σ (mho/m) (measured range)	σ (target)	ρ kg/m^3
2437 MHz Body	50.9 - 53.0	52.7 ±5% (50.1 to 55.3)	1.93 – 2.07	1.95 ±5% (1.85 to 2.05)	1000

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

6.6.1 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: Temperature and Humidity recorded for each day

Table 25

Date	Ambient Temperature (°C)	Liquid Temperature (°C)	Humidity (%)
9th March 2010	20.2	20.0	61.0
10th March 2010	20.8	20.6	52.0
11th March 2010	20.9	20.7	51.0
12th March 2010	20.9	20.8	55.0
15th March 2010	20.6	20.4	57.0
14th May 2010	20.6	20.3	52.0
20th May 2010	20.8	20.5	57.0

6.7 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.

Tissue Type: Brain @ 850/900MHz
Volume of Liquid: 30 Litres

Table 26

Approximate Composition	% By Weight
Distilled Water	41.05
Salt	1.35
Sugar	56.5
HEC	1.0
Bactericide	0.1

Tissue Type: Brain @ 1800/1950MHz MHz
Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	61.17
Salt	0.31
Bactericide	0.29
Triton X-100	38.23

Tissue Type: Body @ 850/900MHz
Volume of Liquid: 30 Litres

Table 27

Approximate Composition	% By Weight
Distilled Water	56
Salt	0.76
Sugar	41.76
HEC	1.21
Bactericide	0.27

`Tissue Type: Body @ 1800/1950MHz MHz
Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	40.4
Salt	0.5
Sugar	58
HEC	1
Bactericide	0.1

*Refer “OET Bulletin 65 97/01 P38”

6.8 Phantom Properties

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

6.9 Device Holder for Laptops and P 10.1 Phantom

A low loss clamp was used to position the Tablet underneath the phantom surface. Small pieces of foam were then used to press the Tablet flush against the phantom surface.

Refer to Appendix A for photographs of device positioning

7.0 SAR MEASUREMENT PROCEDURE USING DASY4

The SAR evaluation was performed with the SPEAG DASY4 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 EUT. 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 3.9 mm from the inner surface of the shell. The area covers the entire dimension of the EUT and the horizontal grid spacing is 15 mm x 15 mm. The actual Area Scan has dimensions of 75mm 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 (1.0 mm for the probe SN: 3563) and the distance between the surface and the lowest measuring point is 1.2 mm (2.0 mm for the probe SN: 3563). 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 Handset 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%.

Uncertainty Budget for DASY4 V4.7 Build 53 – EUT SAR

Table 28

Uncertainty Component	Tol. (6%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i (6%)	10g u_i (6%)	v_i
Measurement System								
Probe Calibration	6.55	N	1	1	1	6.6	6.6	∞
Axial Isotropy	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effects	2	R	1.73	1	1	1.2	1.2	∞
Linearity	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	1	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	0.3	N	1	1	1	0.3	0.3	∞
Response Time	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	2.6	R	1.73	1	1	1.5	1.5	∞
RF Ambient Noise	3	R	1.73	1	1	1.7	1.7	∞
RF Ambient Reflections	3	R	1.73	1	1	1.7	1.7	∞
Probe Positioner	0.8	R	1.73	1	1	0.5	0.5	∞
Probe Positioning	9.9	R	1.73	1	1	5.7	5.7	∞
Max. SAR Eval.	4	R	1.73	1	1	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	1.61	N	1	1	1	1.6	1.6	11
Device Holder Uncertainty	3.6	N	1	1	1	3.6	3.6	7
Output Power Variation – SAR Drift Measurement	0.67	R	1.73	1	1	0.4	0.4	∞
Phantom and Setup								
Phantom Uncertainty	4	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity – Deviation from target values	5	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity – Measurement uncertainty	5	N	1.00	0.64	0.43	3.2	2.2	5
Liquid Permittivity – Deviation from target values	10	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity – Measurement uncertainty	5	N	1.00	0.6	0.49	3.0	2.5	5
Combined standard Uncertainty		RSS				12.8	12.4	154
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2				25.6	24.73	

Estimated total measurement uncertainty for the DASY4 measurement system was ±12.8%. The extended uncertainty (K = 2) was assessed to be ±25.6% based on 95% confidence level. The uncertainty is not added to the measurement result.

Uncertainty Budget for DASY4 V4.7 Build 53 – System Verification

Table 29

Uncertainty Component	Tol. (6%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i (6%)	10g u_i (6%)	v_i
Measurement System								
Probe Calibration	6.55	N	1	1	1	6.6	6.6	∞
Axial Isotropy	4.7	R	1.73	1	1	2.7	2.7	∞
Hemispherical Isotropy	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effects	2	R	1.73	1	1	1.2	1.2	∞
Linearity	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	1	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	0.3	N	1	1	1	0.3	0.3	∞
Response Time	0	R	1.73	1	1	0.0	0.0	∞
Integration Time	0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Noise	3	R	1.73	1	1	1.7	1.7	∞
RF Ambient Reflections	3	R	1.73	1	1	1.7	1.7	∞
Probe Positioner	0.8	R	1.73	1	1	0.5	0.5	∞
Probe Positioning	9.9	R	1.73	1	1	5.7	5.7	∞
Max. SAR Eval.	4	R	1.73	1	1	2.3	2.3	∞
Dipole								
Dipole Axis to Liquid Distance	2	N	1.73	1	1	1.2	1.2	11
Input Power and SAR drift meas.	4.7	R	1.73	1	1	2.7	2.7	∞
Phantom and Tissue Param.								
Phantom Uncertainty	4	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity – Deviation from target values	5	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity – Measurement uncertainty	2.5	N	1.00	0.64	0.43	1.6	1.1	5
Liquid Permittivity – Deviation from target values	10	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity – Measurement uncertainty	2.5	N	1.00	0.6	0.49	1.5	1.2	5
Combined standard Uncertainty		RSS				11.7	11.4	154
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2				23.5	22.79	

Estimated total measurement uncertainty for the DASY4 measurement system was ±11.7%. The extended uncertainty (K = 2) was assessed to be ±23.5% based on 95% confidence level. The uncertainty is not added to the System Verification measurement result.

9.0 EQUIPMENT LIST AND CALIBRATION DETAILS

SPEAG DASY4 Version V4.7 Build 53

Table 30

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	PO1A 6mm	1003	Not Applicable	
Data Acquisition Electronics	SPEAG	DAE3 V1	359	08-July-2010	
Data Acquisition Electronics	SPEAG	DAE3 V1	442	08-Dec-2010	✓
Probe E-Field - Dummy	SPEAG	DP1	N/A	Not applicable	
Probe E-Field	SPEAG	ET3DV6	1380	11-Dec-2010	✓
Probe E-Field	SPEAG	ET3DV6	1377	14-July-2010	
Probe E-Field	SPEAG	ES3DV6	3029	Not Used	
Probe E-Field	SPEAG	EX3DV4	3563	16-July-2010	✓
Probe E-Field	SPEAG	EX3DV4	3557	16-Dec-2010	
Antenna Dipole 300 MHz	SPEAG	D300V2	1005	15-Dec-2011	
Antenna Dipole 450 MHz	SPEAG	D450V2	1009	17-Dec-2010	
Antenna Dipole 900 MHz	SPEAG	D900V2	047	7-July-2010	✓
Antenna Dipole 1640 MHz	SPEAG	D1640V2	314	16-July-2010	
Antenna Dipole 1800 MHz	SPEAG	D1800V2	242	8-July-2010	
Antenna Dipole 1950 MHz	SPEAG	D1950V3	1113	12-Dec -2010	✓
Antenna Dipole 3500 MHz	SPEAG	D3500V2	1002	17-July-2010	
Antenna Dipole 2450 MHz	SPEAG	D2450V2	724	10-Dec-2010	✓
Antenna Dipole 5600 MHz	SPEAG	D5GHzV2	1008	16-Dec-2011	✓
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 Dual	Hewlett Packard	437B	3125012786	29-June-2010	✓
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481H	1545A01634	01-July-2010	✓
RF Power Meter Dual	Gigatronics	8542B	1830125	26-Mar-2010	
RF Power Sensor	Gigatronics	80301A	1828805	26-Mar-2010	
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	30-Sept-2010	
Network Analyser	Hewlett Packard	8753ES	JP39240130	24-Nov-2010	✓
Dual Directional Coupler	Hewlett Packard	778D	1144 04700	*In test	
Dual Directional Coupler	NARDA	3022	75453	*In test	✓

* Calibrated during the test for the relevant parameters.

10.0 OET BULLETIN 65 – SUPPLEMENT C TEST METHOD

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 "LifeBook T series" can be used in either a conventional laptop position (see Appendix A1) or a Tablet configuration. The antenna location in the "LifeBook 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.

10.1.1 "Tablet" Position Definition (0mm spacing)

The device was tested in the 2.00 mm flat section of the AndreT Flat phantom P 10.1 for the "Tablet" position. The Transceiver was placed at the bottom of the phantom and suspended in such way that the back of the device 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

The device was tested in the (2.00 mm) flat section of the AndreT 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.*

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

The device 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, KDB 450824 and KDB 941225 are applied for SAR measurements of the host system. KDB 616217 was used in the SAR evaluation. SAR measurement for the HSDPA and HSUPA modes were not conducted because the results of conducted power measurements showed that neither HSDPA nor HSUPA has RF power output more than 0.25 dB above the UMTS mode levels. Additionally SAR results in WWAN bands are lower than 1.2 mW/g (75% of the SAR limit) therefore worst case UMTS configuration measurements were not repeated in the HSDPA and HSUPA modes.

Testing configurations

Table 31

Phantom Configuration	*Device Mode WWAN Band Name	Antenna Position	Test Configurations		
			CHANNEL (LOW)	Channel (Middle)	Channel (High)
Tablet	GPRS 850 MHz	In		x	
		Out		x	
	GPRS 1900 MHz	In		x	
		Out		x	
	WCDMA 850 MHz	In		x	
		Out		x	
	WCDMA 1900 MHz	In		x	
		Out		x	
Secondary Landscape	GPRS 850 MHz	In		x	
	GPRS 1900 MHz	In		x	
	WCDMA 850 MHz	In		x	
	WCDMA 1900 MHz	In		x	
Secondary Portrait	GPRS 850 MHz	In		x	
		Out		x	
	GPRS 1900 MHz	In		x	
		Out		x	
	WCDMA 850 MHz	In		x	
		Out		x	
	WCDMA 1900 MHz	In		x	
		Out		x	

Legend

X	Testing Required in this configuration
	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: Primary Portrait and Primary Landscape positions were not considered for SAR evaluation due to the separation distances of the UMTS antenna and the notebook edge. (see diagram 1, page 33)

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 device for all test configurations listed in section 10.2.

11.1.1 SAR Results

There are two modes of operation which include UMTS and GPRS transmission. Table below displays the SAR results.

SAR MEASUREMENT RESULTS – 850MHz GPRS Class 10

Table 32

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Tablet Ant In	-	190	836	30, 30, 30	5, 5, 5	Noise Floor	N/A
Tablet Ant Out	1	190	836	30, 30, 30	5, 5, 5	0.440	0.015
Secondary Portrait Ant In	-	190	836	30, 30, 30	5, 5, 5	Noise Floor	N/A
Secondary Portrait Ant Out	2	128	824	30, 30, 30	5, 5, 5	0.304	-0.056
	3	190	836	30, 30, 30	5, 5, 5	0.302	0.108
	4	251	849	30, 30, 30	5, 5, 5	0.250	-0.071
Secondary Landscape Ant In	5	128	824	30, 30, 30	5, 5, 5	0.395	-0.013
	6	190	836	30, 30, 30	5, 5, 5	0.404	0.119
	7	251	849	30, 30, 30	5, 5, 5	0.641	-0.162

NOTE: The measurement uncertainty of 25.6% was not added to the result.

SAR MEASUREMENT RESULTS – 1900MHz GPRS Class 10

Table 33

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Tablet Ant In	-	661	1880	30, 30, 30	5, 5, 5	Noise Floor	N/A
Tablet Ant Out	8	661	1880	30, 30, 30	5, 5, 5	0.156	-0.029
Secondary Portrait Ant In	9	661	1880	30, 30, 30	5, 5, 5	0.069	0.149
Secondary Portrait Ant Out	10	512	1850.2	30, 30, 30	5, 5, 5	0.393	0.000
	11	661	1880	30, 30, 30	5, 5, 5	0.302	-0.009
	12	810	1909.8	30, 30, 30	5, 5, 5	0.185	0.046
Secondary Landscape Ant In	13	512	1850.2	30, 30, 30	5, 5, 5	0.823	-0.231
	14	661	1880	30, 30, 30	5, 5, 5	0.873	0.089
	15	810	1909.8	30, 30, 30	5, 5, 5	0.582	0.104

NOTE: The measurement uncertainty of 25.6% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 850MHz UMTS

Table 34

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Tablet Ant In	-	4183	836.6	30, 30, 30	5, 5, 5	Noise Floor	N/A
Tablet Ant Out	16	4132	826.4	30, 30, 30	5, 5, 5	0.430	-0.137
	17	4183	836.6	30, 30, 30	5, 5, 5	0.428	-0.011
	18	4233	846.6	30, 30, 30	5, 5, 5	0.392	-0.012
Secondary Portrait Ant In	-	4183	836.6	30, 30, 30	5, 5, 5	Noise Floor	N/A
Secondary Portrait Ant Out	19	4132	826.4	30, 30, 30	5, 5, 5	0.241	-0.412
	20	4183	836.6	30, 30, 30	5, 5, 5	0.254	0.017
	21	4233	846.6	30, 30, 30	5, 5, 5	0.211	-0.057
Secondary Landscape Ant In	22	4132	826.4	30, 30, 30	5, 5, 5	0.336	-0.150
	23	4183	836.6	30, 30, 30	5, 5, 5	0.423	-0.347
	24	4233	846.6	30, 30, 30	5, 5, 5	0.454	-0.043

NOTE: The measurement uncertainty of 25.6% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1900MHz UMTS

Table 35

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Tablet Ant In	-	9400	1880	30, 30, 30	5, 5, 5	Noise Floor	N/A
Tablet Ant Out	25	9400	1880	30, 30, 30	5, 5, 5	0.244	-0.019
Secondary Portrait Ant In	26	9400	1880	30, 30, 30	5, 5, 5	0.074	-0.150
Secondary Portrait Ant Out	27	9262	1852.4	30, 30, 30	5, 5, 5	0.539	-0.192
	28	9400	1880	30, 30, 30	5, 5, 5	0.477	-0.079
	29	9538	1907.6	30, 30, 30	5, 5, 5	0.315	-0.049
Secondary Landscape Ant In	30	9262	1852.4	30, 30, 30	5, 5, 5	0.836	-0.254
	31	9400	1880	30, 30, 30	5, 5, 5	1.01	-0.110
	32	9538	1907.6	30, 30, 30	5, 5, 5	0.975	-0.279

NOTE: The measurement uncertainty of 25.6% was not added to the result.

The highest SAR level recorded was 1.01 mW/g as evaluated in a 1g cube of averaging mass. This value was obtained in Secondary Landscape Ant In position in UMTS mode, utilizing channel 9400 (1880 MHz).

Table: SAR MEASUREMENT RESULTS – Multiband Co-transmission with Intel 622ANHMW WLAN (Host System # 1)**.**

Table 36

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results(mW/g)		Measured Drift (dB)
						Combined	Stand alone	
Secondary Portrait Ant B WiFi WWAN Ant Out	33	140	5700	50, 70, 30	4, 4, 2.5	1.41	-	0.096
Secondary Portrait Ant Out GPRS		128	824.2	50, 70, 30	4, 4, 2.5			-0.071
Secondary Portrait Ant B WiFi WWAN Ant Out	34	140	5700	50, 70, 30	4, 4, 2.5	-	1.20	0.096
Secondary Portrait Ant Out GPRS	35	128	824.2	50, 70, 30	4, 4, 2.5	-	0.213	-0.071

Table 37

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results(mW/g)		Measured Drift (dB)
						Combined	Stand alone	
Secondary Portrait Ant B WiFi WWAN Ant Out	36	140	5700	50, 70, 30	4, 4, 2.5	**1.50**	**-**	0.096
Secondary Portrait Ant Out UMTS		9262	1852.4	50, 70, 30	4, 4, 2.5			-0.006
Secondary Portrait Ant Out UMTS	37	9262	1852.4	50, 70, 30	4, 4, 2.5	-	0.305	-0.006
Secondary Portrait Ant B WiFi WWAN Ant Out	38	140	5700	50, 70, 30	4, 4, 2.5	1.44	-	0.096
Secondary Portrait Ant Out GPRS		512	1850.2	50, 70, 30	4, 4, 2.5			-0.243
Secondary Portrait Ant Out GPRS	39	512	1850.2	50, 70, 30	4, 4, 2.5	-	0.245	-0.243

NOTE: The measurement uncertainty of 25.6% was not added to the result.

Table: SAR MEASUREMENT RESULTS – Multiband Co-transmission with Atheros AR5B97 WLAN (Host System # 2)**.**

Table 38

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results(mW/g)		Measured Drift (dB)
						Combined	Stand alone	
Secondary Portrait Ant B WiFi WWAN Ant Out	40	06	2437	50, 70, 30	4.3, 4.3, 3	1.40	-	-0.118
Secondary Portrait Ant Out UMTS		9262	1852.4	50, 70, 30	4.3, 4.3, 3			-0.139
Secondary Portrait Ant B WiFi WWAN Ant Out	41	06	2437	50, 70, 30	4.3, 4.3, 3	-	1.04	-0.118
Secondary Portrait Ant Out UMTS	42	9262	1852.4	50, 70, 30	4.3, 4.3, 3	-	0.40	-0.139
Secondary Portrait Ant B WiFi WWAN Ant Out	43	06	2437	50, 70, 30	4.3, 4.3, 3	1.32	-	-0.118
Secondary Portrait Ant Out GPRS		512	1850.2	50, 70, 30	4.3, 4.3, 3			-0.120
Secondary Portrait Ant Out GPRS	44	512	1850.2	50, 70, 30	4.3, 4.3, 3	-	0.312	-0.120

NOTE: The measurement uncertainty of 25.6% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 5GHz WLAN Intel 622ANHMW WLAN (Host System # 1)

Table 39

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Secondary Landscape Ant A	45	52	5260	24, 24, 20	4, 4, 2.5	1.20	-0.001
Secondary Portrait Ant B WWAN Ant Out	46	100	5500	24, 24, 20	4, 4, 2.5	1.21	-0.042
	47	120	5600	24, 24, 20	4, 4, 2.5	1.07	-0.128
	48	140	5700	24, 24, 20	4, 4, 2.5	1.34	-0.221
Secondary Portrait Ant B WWAN Ant Out	49	149	5745	24, 24, 20	4, 4, 2.5	1.02	-0.289
	50	157	5785	24, 24, 20	4, 4, 2.5	0.996	-0.458
	51	165	5825	24, 24, 20	4, 4, 2.5	0.958	-0.247

NOTE: The measurement uncertainty of 25.6% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 2.45GHz WLAN Atheros AR5B97 WLAN (Host System # 2)

Table 40

Test Position	Plot No.	Test Channel	Test Freq (MHz)	Zoom vol. x, y, z	Zoom Step x, y, z	Measured 1g SAR Results (mW/g)	Measured Drift (dB)
Secondary Portrait Ant B WWAN Ant Out	45	06	2437	30, 30, 30	5, 5, 5	1.22	-0.079

NOTE: The measurement uncertainty of 25.6% was not added to the result.

Results from tables 39 and 40 represent subset all WLAN test channels of the SAR test results higher than 1.2 mW/g from reports No.: M100214_FCC_622ANHMW_SAR_2.4 and M100214_FCC_622ANHMW_SAR_5.6 (FCCID:EJE-WL0021) and M100216_FCC_AR5B97_SAR_2.4 and M100216_FCC_AR5B97_SAR_5.6 (FCCID: PPD-AR5B97-F) which are “Identical Production Samples”, the same as Host System #1 and Host System #2 of this report. During WLAN testing of FCCID:EJE-WL0021 and FCCID: PPD-AR5B97-F WWAN antenna was IN (closed) – not used (non-transmitting). For the purpose of Multiband Evaluation Assessment, tables 39 and 40 list SAR test results of the repeated test (of above mentioned subset of channels) this time with the WWAN antenna OUT (opened).

12.0 COMPLIANCE STATEMENT

The Fujitsu Tablet PC, Model: T730 / TH700 with SIERRA WIRELESS Mini-PCI Wireless WAN Module, Model: Gobi2000 was found to comply with the FCC and RSS-102 SAR requirements.

The highest SAR level recorded was 1.50 mW/g for a 1g cube. This value was measured in Co-transmission configuration at 1852.4 MHz (channel 9262) for Wireless WAN and at 5500 MHz (channel 140) for Wireless LAN in the “Secondary Portrait” position in UMTS and OFDM transmission modes respectively. This was below the limit of 1.6 mW/g for uncontrolled exposure, but was within the band of measurement uncertainty around the limit.

13.0 MULTIBAND EVALUATION CONSIDERATIONS

According to the FCC SAR evaluation procedures, when the sum of SAR results (simultaneously transmitting antennas WLAN and WWAN) is > 1.6mW/g and the distance between the antennas is 5cm or less, or the ratio of above sum to the distance between peak SAR locations > 0.3, simultaneous transmission SAR evaluation is required.

The Bluetooth module operates in the 2.4GHz range. According to the FCC SAR evaluation procedures, applying 60/f gives an output power threshold of 25mW (60/2.4 = 25). The Bluetooth module has a maximum output power < 5mW and therefore stand-alone SAR was not required.

The shortest distance between the BT module and any other transmitting antenna was 191mm.

Because 191mm > 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

Host System #1:
Multiband evaluation was conducted for a number of configurations of UMTS/GSM WWAN (Gobi2000) and WIFI (622ANHMW) because the ratio of the sum of the highest SAR results to the distance between peak SAR locations was > 0.3. Summary of the highest SAR results considered for multiband evaluation:

Secondary Portrait
5.7 GHz WLAN 1.34 mW/g + 1900 MHz UMTS WWAN 0.539 = 1.879; Peak to Peak distance = 3mm
5.7 GHz WLAN 1.34 mW/g + 850 MHz GPRS WWAN 0.304 = 1.644; Peak to Peak distance = 15mm
5.7 GHz WLAN 1.34 mW/g + 1900 MHz GPRS WWAN 0.393 = 1.733; Peak to Peak distance = 2mm

Following configurations were considered for multiband evaluation, but did not require “simultaneous transmission” SAR testing, because the ratio of the sum of the highest SAR results to the distance between peak SAR locations was < 0.3 – “the SAR to peak location separation ratios are < 0.3 for all simultaneous transmitting antenna pairs” (KDB pub. 447498).

Secondary Landscape
5.2 GHz WLAN 1.21 mW/g + 850 MHz UMTS WWAN 0.454 = 1.664; Peak to Peak distance = 207mm
1.664 / 20.7 = 0.08 < 0.3

5.2 GHz WLAN 1.21 mW/g + 1900 MHz UMTS WWAN 1.01 = 2.22; Peak to Peak distance = 174mm
2.22 / 17.4 = 0.128 < 0.3

5.2 GHz WLAN 1.21 mW/g + 850 MHz GPRS WWAN 0.641 = 1.851; Peak to Peak distance = 203mm
1.851 / 20.3 = 0.091 < 0.3

5.2 GHz WLAN 1.21 mW/g + 1900 MHz GPRS WWAN 0.873 = 2.083; Peak to Peak distance = 176mm
2.083 / 17.6 = 0.118 < 0.3

Host System #2:
Multiband evaluation was conducted for a number of configurations of UMTS/GSM WWAN (Gobi2000) and WIFI (AR5B97) because the ratio of the sum of the highest SAR results to the distance between peak SAR locations was > 0.3. Summary of the highest SAR results considered for multiband evaluation:

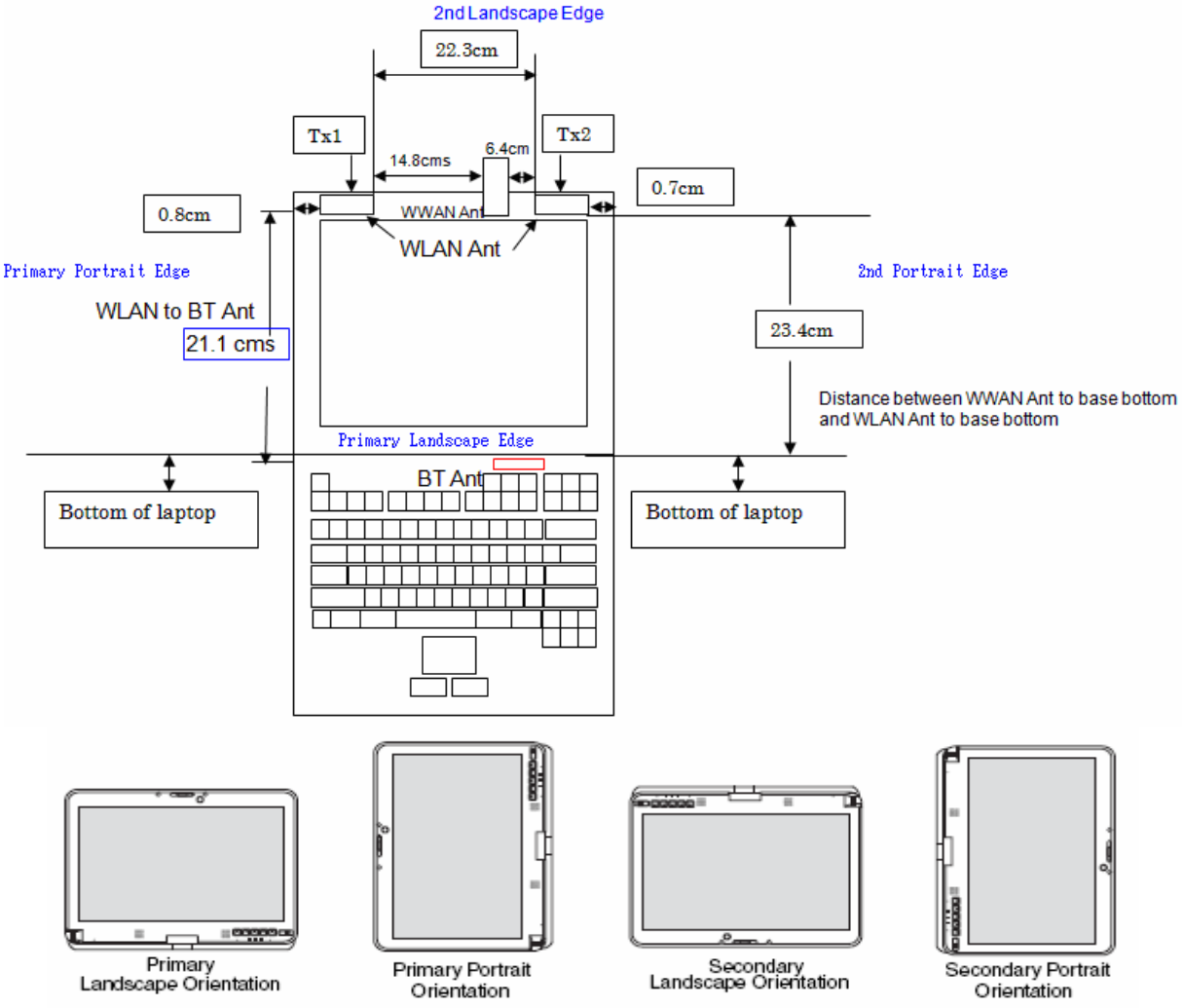
Secondary Portrait
2.45 GHz WLAN 1.22 mW/g + 1900 MHz UMTS WWAN 0.539 = 1.759; Peak to Peak distance = 1mm
2.45 GHz WLAN 1.22 mW/g + 1900 MHz GPRS WWAN 0.393 = 1.613; Peak to Peak distance = 1mm

NOTE: Throughout this report, Antenna A, B and C refer to Tx1, Tx2 and Tx3 in the host

Diagrams Showing Antenna Positions Host System #1

Note: The lines visible at the top of some of the following diagrams are superimposed images of the area scans of the SAR tests. These are included to graphically show peak SAR locations.

Diagram No. 1: **T730 / T700 WLAN and UMTS Antenna Location**



WLAN (Tx 1 & Tx 2) Antenna length = 28mm
WWAN Antenna length projected from LCD upper edge= 52 mm

Open WWAN Ant to 2nd Portrait edge = 64+28+ 7 = 99mm
Closed WWAN Ant to 2nd Portrait edge = 7+28+12 = 47mm
Closed WWAN Ant to WLAN Tx 2 Ant = 12mm

Closed or Open WWAN Ant to Primary Portrait edge = 148+28+8 = 184mm
Closed or Open WWAN Ant to WLAN Tx 1 Ant = 148mm

Distance between WWAN Ant to base bottom and WLAN Ant to base bottom

Cross section for closed WWAN Ant to 2nd Portrait edge

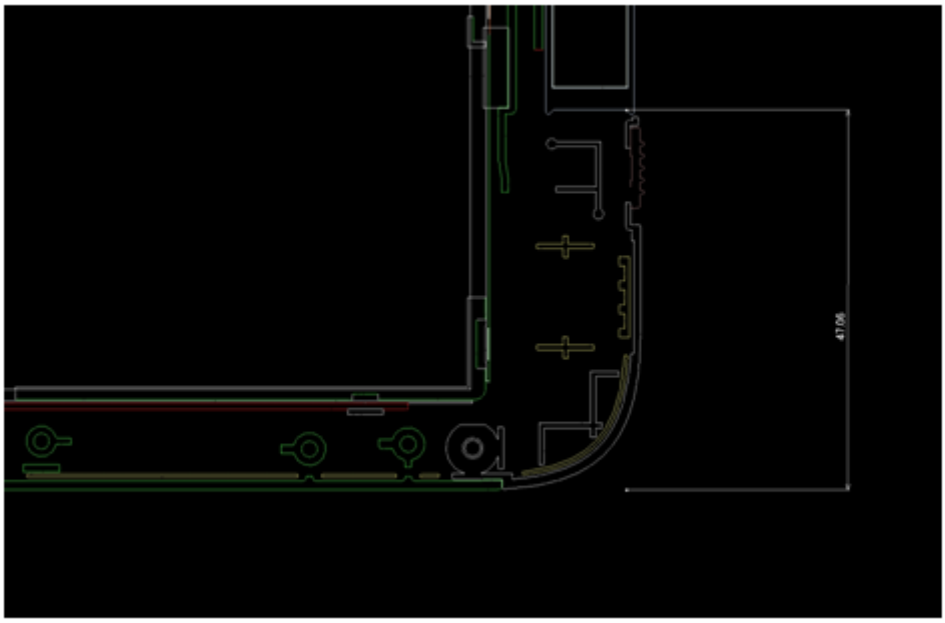


Diagram No. 2: 5.5 GHz WLAN + 1900 MHz UMTS WWAN Drawn to scale

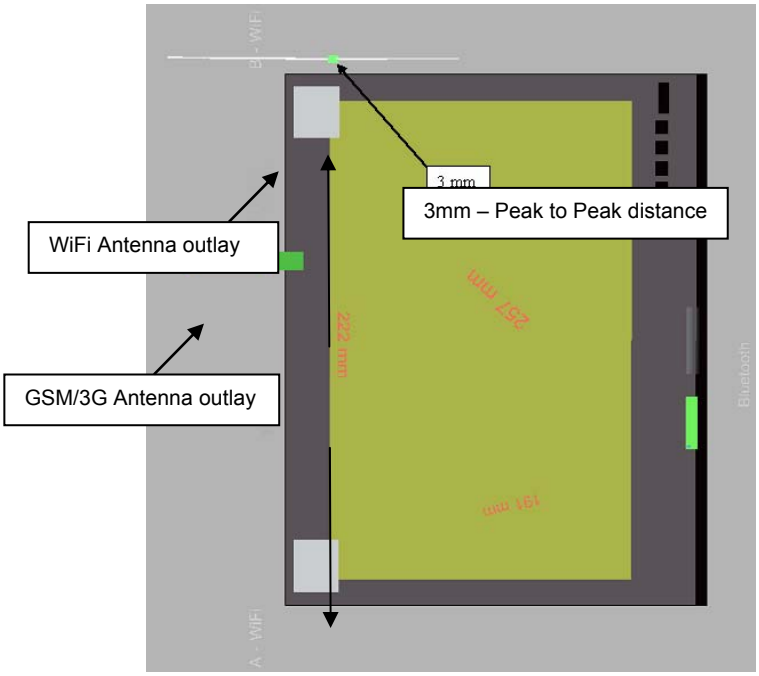


Diagram No. 3: 5.5 GHz WLAN + 850 MHz GPRS WWAN Drawn to scale

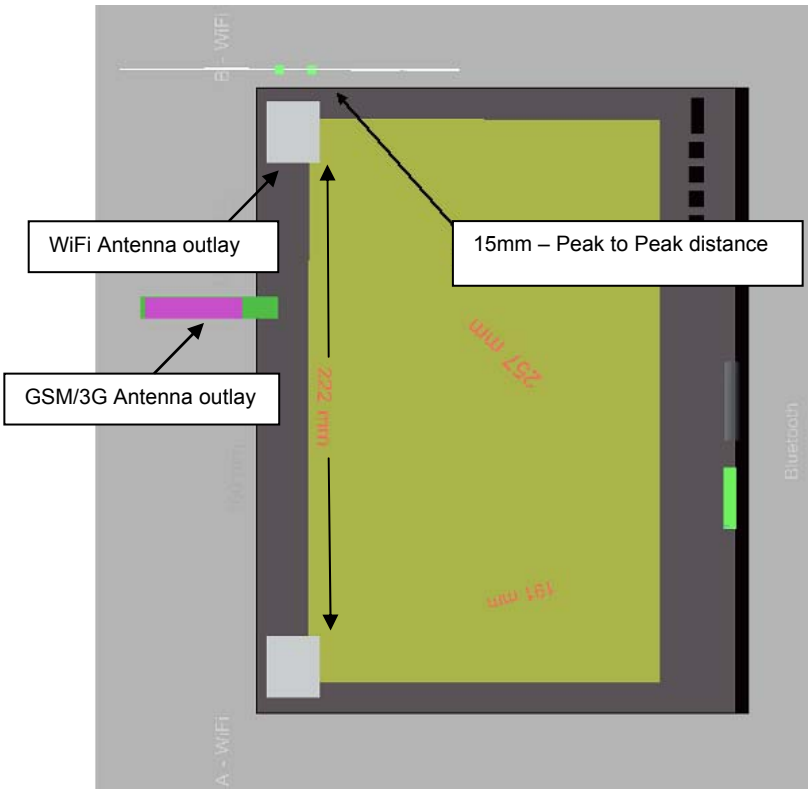


Diagram No. 4: 5.5 GHz WLAN + 1900 MHz GPRS WWAN Drawn to scale

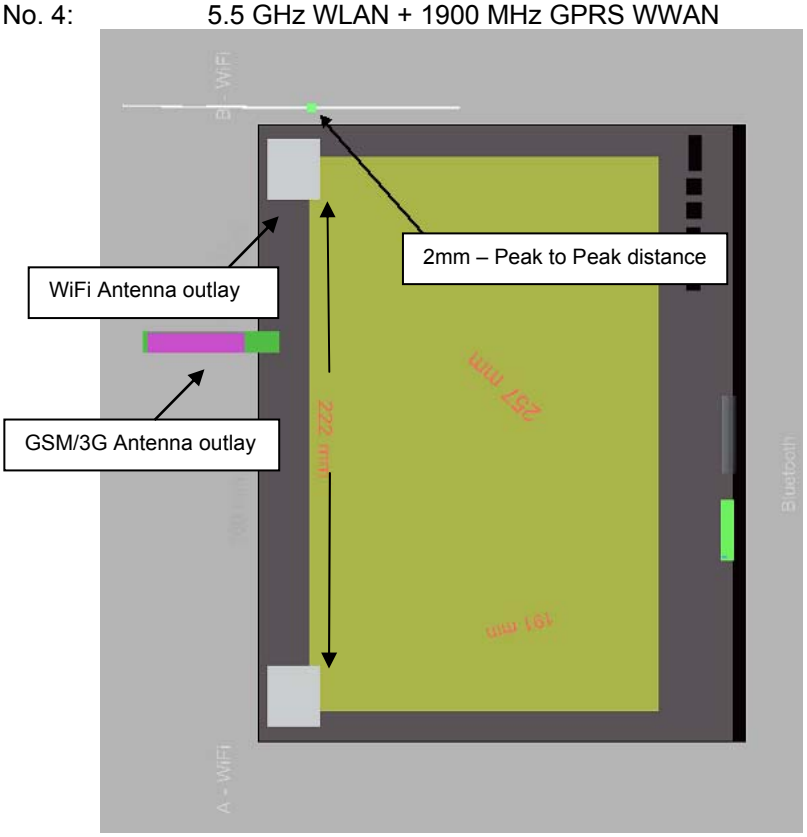


Diagram No. 5: 5.2 GHz WLAN + 850 MHz UMTS WWAN Drawn to scale

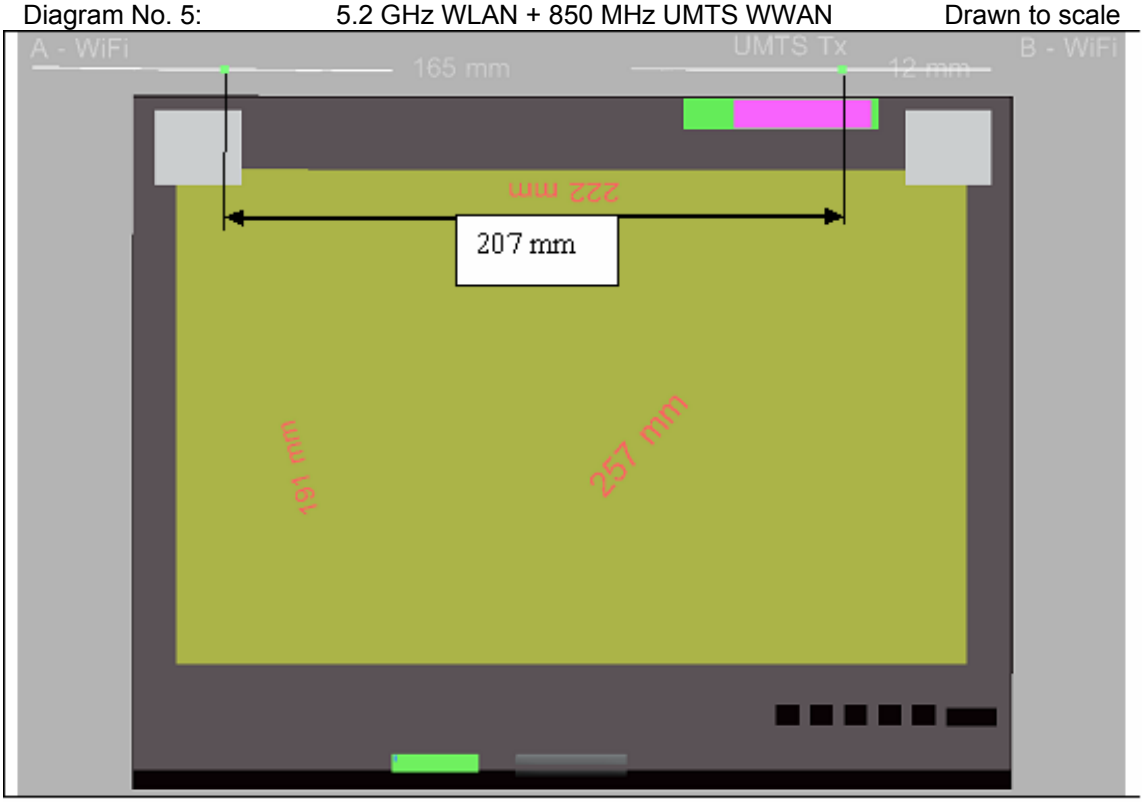


Diagram No. 6: 5.2 GHz WLAN + 1900 MHz UMTS WWAN Drawn to scale

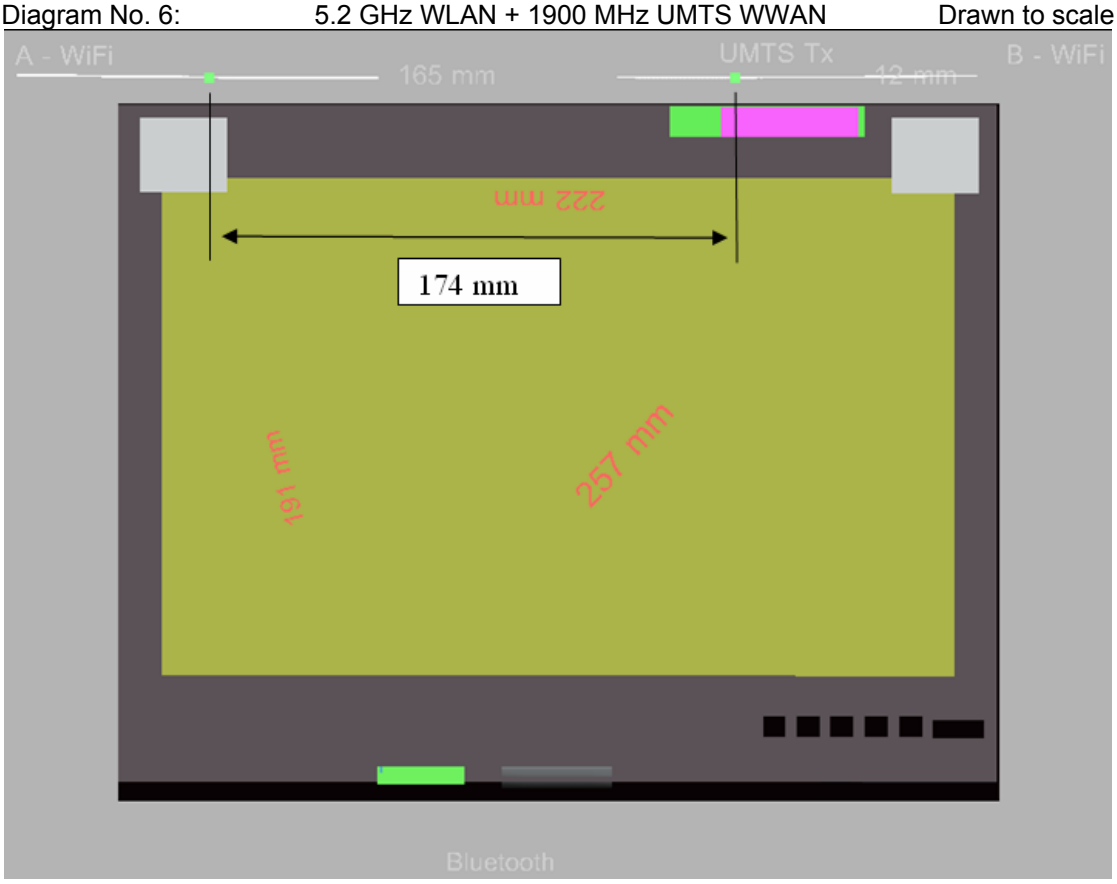


Diagram No. 7: 5.2 GHz WLAN + 850 MHz GPRS WWAN Drawn to scale

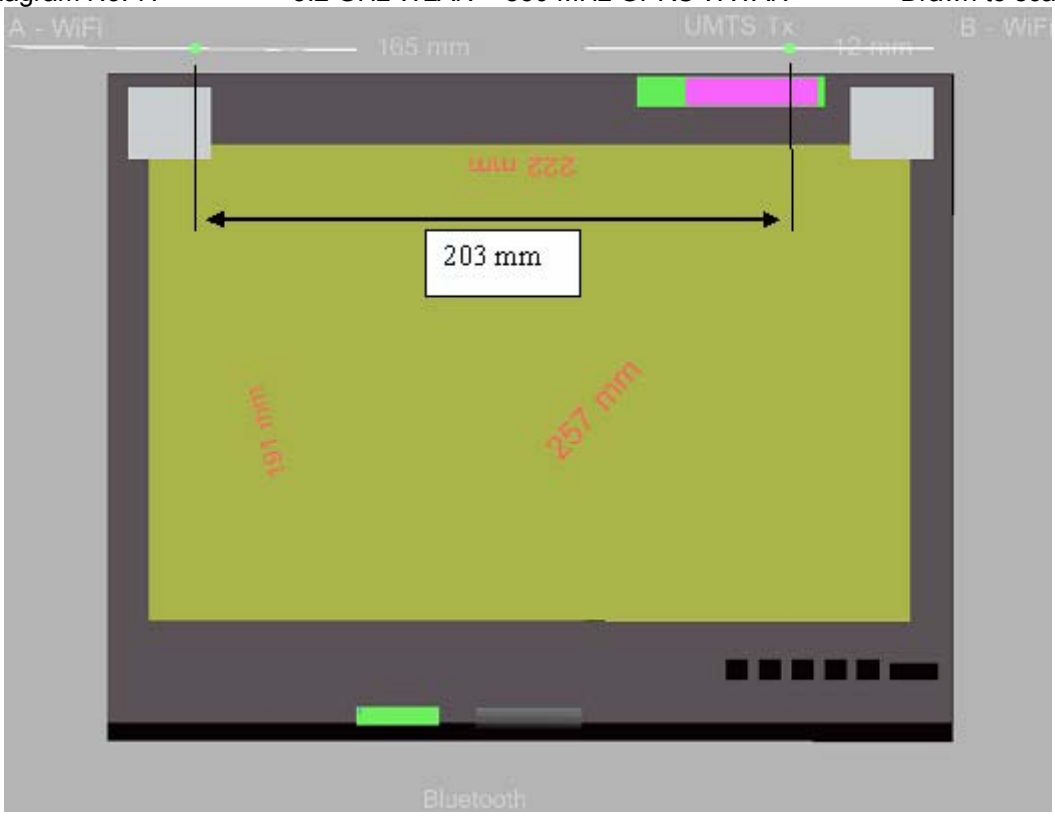
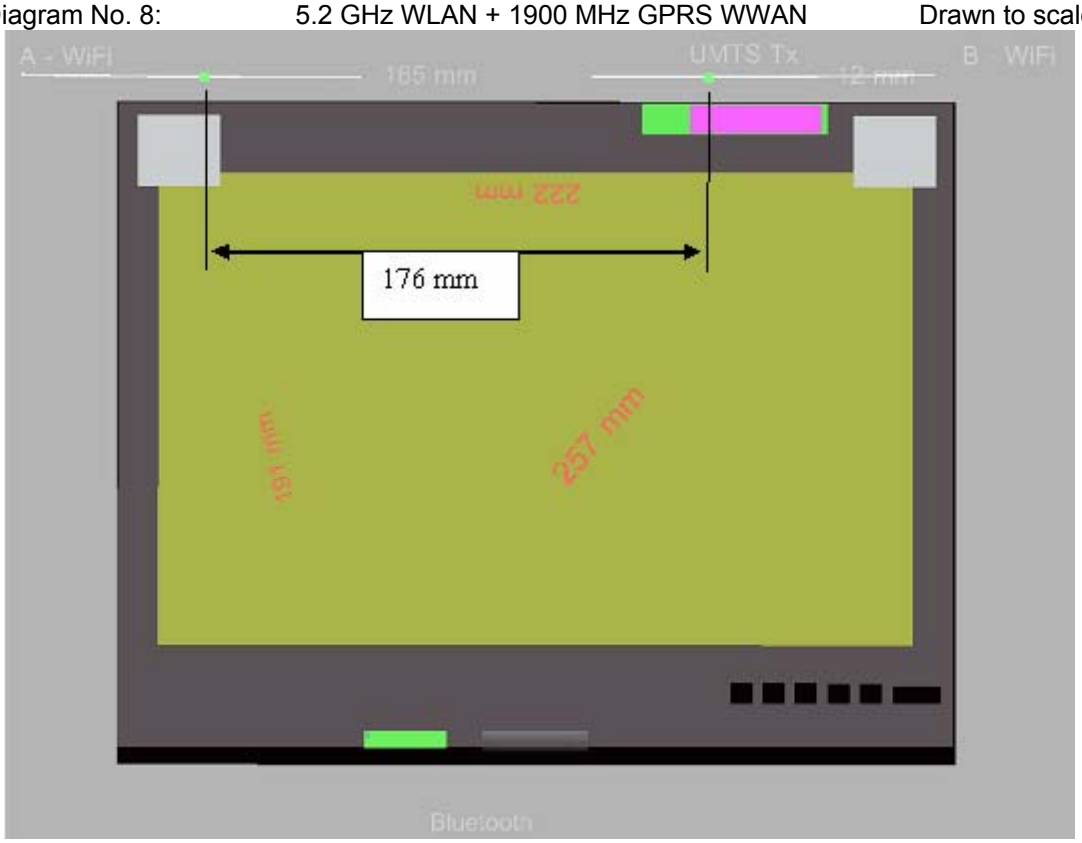


Diagram No. 8: 5.2 GHz WLAN + 1900 MHz GPRS WWAN Drawn to scale



Diagrams Showing Antenna Positions Host System #2

Diagram No. 9: 2.45 GHz WLAN + 1900 MHz UMTS WWAN Drawn to scale

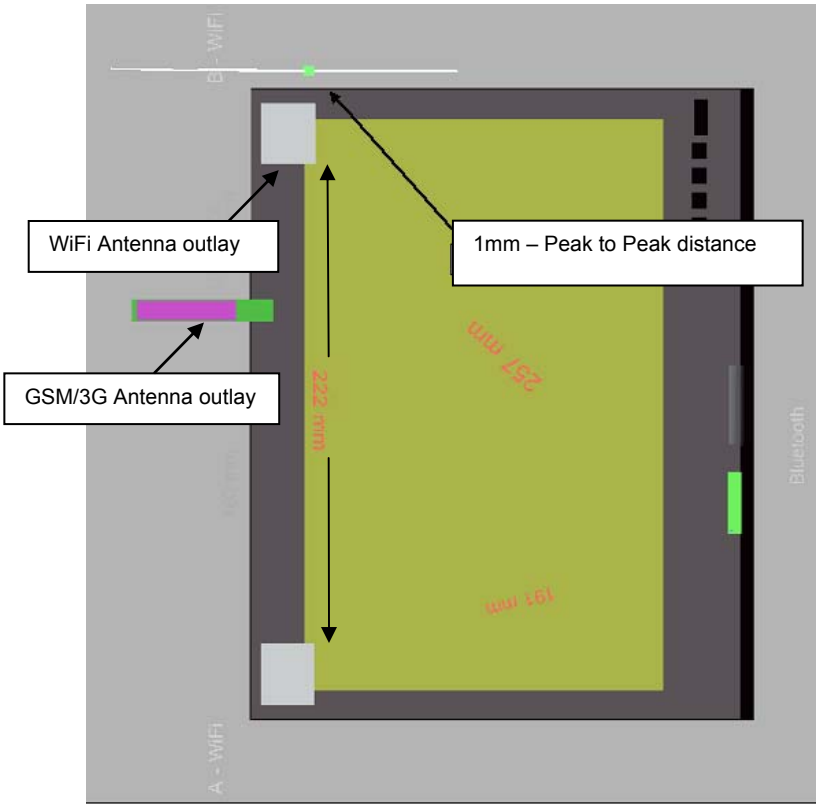


Diagram No. 10: 2.45 GHz WLAN + 1900 MHz GPRS WWAN Drawn to scale