SAR Evaluation Report

IN ACCORDANCE WITH THE REQUIREMENTS OF
FCC OET BULLETIN 65 SUPPLEMENT C
IC RSS 102 ISSUE 2 : NOVERMBER 2005

FOR

T2010 TABLET COMPUTERS WITH WWAN MC5725 AND INTEL OR ATHEROS WLAN MODULES

MODEL: MC5725

FCC ID: N7N-MC5725-F

REPORT NUMBER: 08U11599-2

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Prepared for

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issued date	Revisions	Revised By
--	March 4, 2008	Initial issue	Hsin Fu Shih

CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

DATES OF TEST: February 8th, 11th, 12th, and March 3rd 2008

APPLICANT: ADDRESS:	Fujitsu Australia PTY Ltd 1230 Nepena Highway Cheltenham, VIC 3192
FCC ID: MODEL:	N7N-MC5725-F MC5725
DEVICE CATEGORY: EXPOSURE CATEGORY:	Portable Device General Population/Uncontrolled Exposure

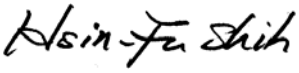
T2010 Tablet computer with WWAN MC5725 and Intel or Atheros WLAN modules.

Test Sample is a:	Production unit		
Rule Parts	Frequency Range [MHz]	The Highest SAR Values [1g_mW/g]	The Highest Multi-Band SAR Values [1g_mW/g]
FCC 22H	824 - 849	0.683	0.855
FCC 24E	1850 - 1909	0.742	0.923

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in FCC OET 65 Supplement C (Edition 01-01) and RSS 102.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



Hsin Fu Shih
Engineering Supervisor
Compliance Certification Services

Tested By:

Jonathan King
EMC Engineer
Compliance Certification Services

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1 DEVICE UNDER TEST (DUT) DESCRIPTION

T2010 Tablet computer with WWAN MC5725 and Intel or Atheros WLAN modules. The WWAN MC5725 module with CDMA2000 1xRTT, 1xEv-DO Rel 0 and Rev A	
Normal operation:	Lap-held position, and underarm position
Duty cycle:	WWAN - Sierra Wireless CDMA2000 Module 1xRTT/Rel 0/Rev A: 100% WLAN - Atheros 802.11 bg Module 802.11b mode: 100% 802.11g mode: 100% WLAN – Intel 802.11abgn Module 802.11b mode: 98% 802.11g mode: 91%
Host Device(s):	Fujitsu T2010 Tablet Laptop
Power supply:	Power supplied through the laptop computer (host device).

2 FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, CA 94538 USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

NVLAP LAB CODE 200065-0

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

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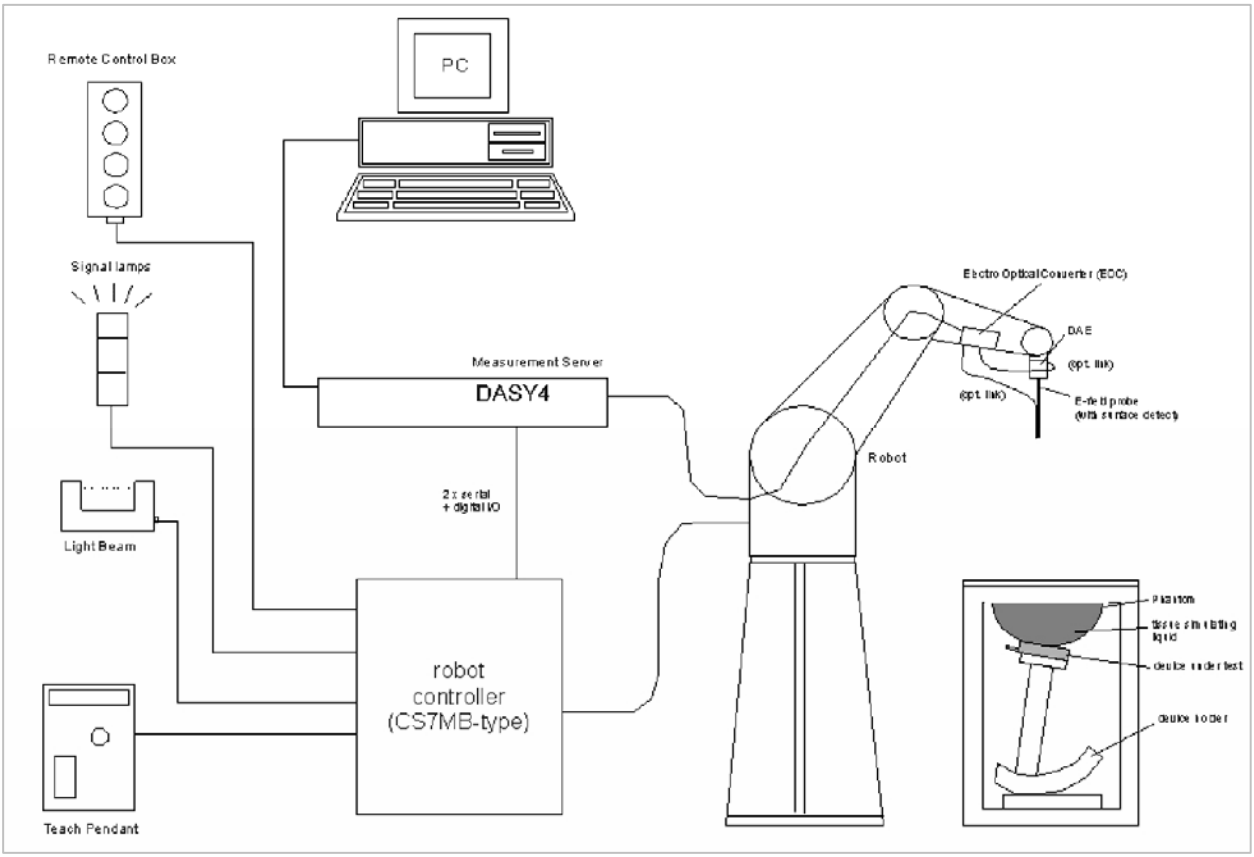
3 SYSTEM DESCRIPTION



The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

3.1 COMPOSITION OF INGREDIENTS FOR TISSUE SIMULATING LIQUIDS

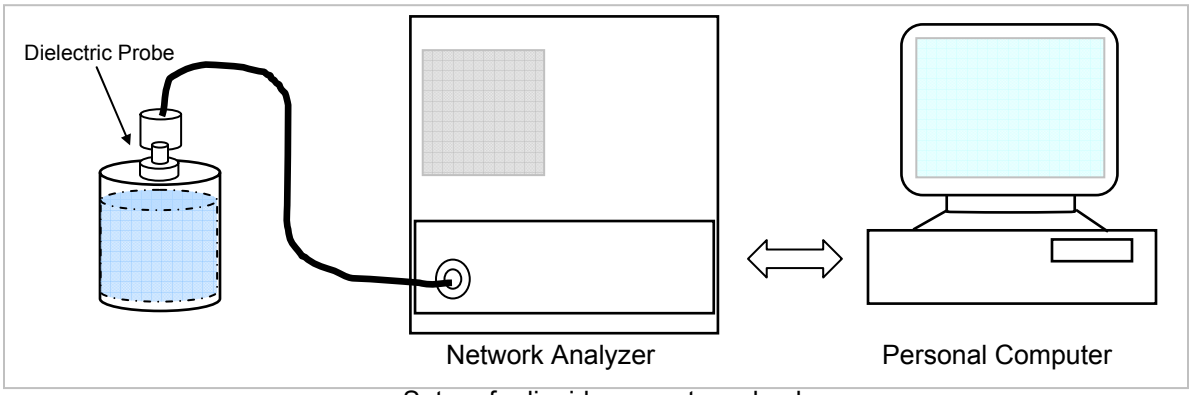
The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

4 SIMULATING LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values. The relative permittivity and conductivity of the tissue material should be within ± 5% of the values given in the table below.



Set-up for liquid parameters check

Reference Values of Tissue Dielectric Parameters for Head and Body Phantom
(for 150 – 3000 MHz and 5800 MHz)

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in IEEE Standard 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE Standard 1528.

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

4.1 SIMULATING LIQUID PARAMETER CHECK RESULT

Simulating Liquid Dielectric Parameters Check Result @ Muscle 835 MHz

Room Ambient Temperature = 23°C; Relative humidity = 45% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
835	22	15	e'	54.5633	Relative Permittivity (ε_r):	54.5633	55.2	-1.15	± 5
			e"	20.5761	Conductivity (σ):	0.95580	0.97	-1.46	± 5

Liquid Check
Ambient temperature: 23 deg. C; Liquid temperature: 22 deg. C
February 08, 2008 10:31 AM

Frequency	e'	e"
800000000.	54.8950	20.6890
805000000.	54.8521	20.6675
810000000.	54.8069	20.6527
815000000.	54.7546	20.6461
820000000.	54.7183	20.6339
825000000.	54.6543	20.6042
830000000.	54.5870	20.5926
835000000.	54.5633	20.5761
840000000.	54.5043	20.5510
845000000.	54.4500	20.5353
850000000.	54.3646	20.5207
855000000.	54.3327	20.5295
860000000.	54.2897	20.4778
865000000.	54.2136	20.4500
870000000.	54.1494	20.4501
875000000.	54.0977	20.4243
880000000.	54.0393	20.4331
885000000.	54.0023	20.4127
890000000.	53.9678	20.4229
895000000.	53.9290	20.3929
900000000.	53.8711	20.3654
905000000.	53.8401	20.3640
910000000.	53.7760	20.3810
915000000.	53.7547	20.3345
920000000.	53.6907	20.2951
925000000.	53.6630	20.2928
930000000.	53.6158	20.2779
935000000.	53.5398	20.2649
940000000.	53.5051	20.2757
945000000.	53.4419	20.2882
950000000.	53.3969	20.2933

The conductivity (σ) can be given as:

$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$

where $f = \text{target } f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters Check Result @ Muscle 1900 MHz

Room Ambient Temperature = 23°C; Relative humidity = 45% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
1900	22	15	e'	51.3876	Relative Permittivity (ε_r):	51.3876	53.3	-3.59	± 5
			e"	14.1743	Conductivity (σ):	1.49822	1.52	-1.43	± 5

Liquid Check
Ambient temperature: 23 deg. C; Liquid temperature: 22 deg. C
February 11, 2008 10:04 AM

Frequency	e'	e"
1710000000.	52.1757	13.5834
1720000000.	52.1278	13.6188
1730000000.	52.0826	13.6593
1740000000.	52.0432	13.6775
1750000000.	52.0013	13.7301
1760000000.	51.9668	13.7626
1770000000.	51.9361	13.7886
1780000000.	51.8879	13.8256
1790000000.	51.8474	13.8564
1800000000.	51.7953	13.9009
1810000000.	51.7563	13.9203
1820000000.	51.6832	13.9476
1830000000.	51.6362	13.9782
1840000000.	51.5843	14.0133
1850000000.	51.5560	14.0570
1860000000.	51.4971	14.0670
1870000000.	51.4744	14.0921
1880000000.	51.4407	14.1270
1890000000.	51.4077	14.1403
1900000000.	51.3876	14.1743
1910000000.	51.3461	14.2099

The conductivity (σ) can be given as:

$\sigma = \omega\varepsilon_0 e'' = 2\pi f \varepsilon_0 e''$

where f = target $f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameter Check Result @ Muscle 2450 MHz

Room Ambient Temperature = 23°C; Relative humidity = 45% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
2450	22	15	e'	50.6424	Relative Permittivity (ε_r):	50.6424	52.7	-3.90	± 5
			e"	14.6165	Conductivity (σ):	1.99218	1.95	2.16	± 5

Liquid Check
Ambient temperature: 23 deg. C; Liquid temperature: 22 deg. C
February 12, 2008 11:16 AM

Frequency	e'	e"
2400000000.	50.8679	14.4258
2405000000.	50.8418	14.4527
2410000000.	50.8260	14.4637
2415000000.	50.8224	14.4784
2420000000.	50.7875	14.4910
2425000000.	50.7602	14.5127
2430000000.	50.7484	14.5378
2435000000.	50.7157	14.5483
2440000000.	50.7014	14.5767
2445000000.	50.6701	14.5968
2450000000.	50.6424	14.6165
2455000000.	50.6326	14.6326
2460000000.	50.6125	14.6579
2465000000.	50.6056	14.6818
2470000000.	50.5587	14.6966
2475000000.	50.5458	14.7209
2480000000.	50.5288	14.7504
2485000000.	50.5139	14.7813
2490000000.	50.4999	14.8038
2495000000.	50.4826	14.8380
2500000000.	50.4788	14.8591

The conductivity (σ) can be given as:

$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$

where $f = \text{target } f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Parameter Check Result @ Muscle 5GHz

Room Ambient Temperature = 24°C; Relative humidity = 45% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
5800	23	15	e'	45.264	Relative Permittivity (ε_r):	45.2640	48.2	-6.09	± 10
			e"	19.4757	Conductivity (σ):	6.28406	6.00	4.73	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
March 03, 2008 8:30 AM

Frequency	e'	e"
4600000000.	47.5364	17.8111
4650000000.	47.9496	17.7986
4700000000.	47.1881	17.8274
4750000000.	47.8122	18.1470
4800000000.	47.2276	17.8964
4850000000.	47.3213	18.3169
4900000000.	47.4922	18.1001
4950000000.	46.7637	18.2412
5000000000.	47.4038	18.4561
5050000000.	46.6699	18.2532
5100000000.	47.0203	18.6467
5150000000.	46.7728	18.3776
5200000000.	46.3986	18.7318
5250000000.	46.9912	18.6509
5300000000.	46.0554	18.6680
5350000000.	46.7389	18.9342
5400000000.	46.1241	18.6165
5450000000.	46.1881	19.1208
5500000000.	46.4186	18.7916
5550000000.	45.5878	18.9851
5600000000.	46.2876	19.1268
5650000000.	45.4655	18.8829
5700000000.	45.7968	19.3581
5750000000.	45.6129	18.9903
5800000000.	45.2640	19.4757
5850000000.	45.7963	19.2637
5900000000.	44.8704	19.3433
5950000000.	45.5201	19.6520
6000000000.	44.9713	19.3095

The conductivity (σ) can be given as:

$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$

where $f = \text{target } f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

5 SYSTEM PERFORMANCE CHECK

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications of ±10%.

System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV3-SN: 3554 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
- Special 5 x 5 x 7 fine cube was chosen for cube integration(dx=dy=7.5mm; dz=5mm).
- Distance between probe sensors and phantom surface was set to 4 mm.
- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

In the table below, the numerical reference SAR values of a SPEAG validation dipoles placed below the flat phantom filled with body-tissue simulating liquid are given. The reference SAR values were calculated using the finite-difference time-domain method and the geometry parameters.

Dipole Type	Distance (mm)	Frequency (MHz)	SAR (1g) [W/kg]	SAR (10g) [W/kg]	SAR (peak) [W/kg]
D450V2	15	450	5.01	3.36	7.22
D835V2	15	835	9.71	6.38	14.1
D900V2	15	900	11.1	7.17	16.3
D1450V2	10	1450	29.6	16.6	49.8
D1800V2	10	1800	38.5	20.3	67.5
D1900V2	10	1900	39.8	20.8	69.6
D2000V2	10	2000	40.9	21.2	71.5
D2450V2	10	2450	51.2	23.7	97.6

Note: All SAR values normalized to 1 W forward power.

f (MHz)	Head Tissue		Body Tissue		
	SAR_{1g}	SAR_{10g}	SAR_{1g}	SAR_{10g}	SAR_{Peak}
5000	72.9	20.7	68.1	19.2	260.3
5100	74.6	21.1	78.8	19.6	272.3
5200	76.5	21.6	71.8	20.1	284.7
5500	83.3	23.4	79.1	22.0	326.3
5800	78.0	21.9	74.1	20.5	324.7

Note: All SAR values normalized to 1 W forward power.

5.1 SYSTEM PERFORMANCE CHECK RESULTS

System Validation Dipole: D835V2 SN:4d002

Date: February 8, 2008

Ambient Temperature = 23°C; Relative humidity = 45% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
835	22	15	1g	2.41	9.64	9.71	-0.72	± 10
			10g	1.59	6.36	6.38	-0.31	± 10

System Validation Dipole: D1900V2 SN:5d043

Date: February 11, 2008

Ambient Temperature = 23°C; Relative humidity = 45% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
1900	22	15	1g	9.96	39.84	39.8	0.10	± 10
			10g	5.13	20.52	20.8	-1.35	± 10

System Validation Dipole: D2450V2 SN: 706

Date: February 12, 2008

Ambient Temperature = 23°C; Relative humidity = 45% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
2450	22	15	1g	13.20	52.8	51.2	3.12	± 10
			10g	5.96	23.84	23.7	0.59	± 10

System Validation Dipole: D5GHzV2 SN 1003

Date: March 3, 2008

Ambient Temperature = 24°C; Relative humidity = 45% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
5800	23	15	1g	19.10	76.4	74.1	3.10	± 10
			10g	5.4	21.6	20.5	5.37	± 10

6 SAR MEASURMENT PROCEDURE

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.

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 EUT and the horizontal grid spacing is 15 mm x 15 mm. Based on this data, the area of the maximum absorption is determined by Spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

b) Around this point, a volume of X=Y= 30 and Z=21 mm is assessed by measuring 5 x 5 x 7 mm 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 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 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.

6.1 DASY4 SAR MEASURMENT PROCEDURE

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 1.2 mm for an EX3DV3 probe type).

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY4 software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures 5 x 5 x 7 points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

6.2 DASY4 MULTIBAND SAR MEASURMENT PROCEDURE

STEP 1: POWER REFERENCE MEASUREMENT
The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 1.2 mm for an EX3DV3 probe type).

STEP 2: VOLUME SCAN JOB
Volume Scans are used to assess peak SAR and averaged SAR measurement in largely extended 3-deimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location. The steps in horizontal and vertical directions are 15mm for both below 4.5 GHz and above 4.5 GHz.

STEP 3: POWER DRIFT MEASUREMENT
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

STEP 5: Z-SCAN
The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

STEP 5: MULTIBAND DATA EXTRACTIONS
After SAR measurements in each liquid, SEMCAD tool is used to evaluate the combined SAR from different bands.

7 PROCEDURE USED TO ESTABLISH TEST SIGNAL

3G-CDMA2000 1xRTT

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
CDMA2000 Mobil Test	B.10.11, L

1xRTT

- Call Setup > Shift & Preset
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > RC3 (Fwd3, Rvs3)
- FCH Service Option (SO) Setup > 32 (+ F-SCH)
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Cell Info > Cell Parameters > System ID (SID) > 8
  > Network ID (NID) > 65535

Once “Active Cell” show “Connected ” then change “Rvs Power Ctrl” from “Active bits” to “All Up bits” to get the maximum power.

Worst-case Measurement Result @ Low, Middle and High Channel

Cellular Band

Radio Configuration (RC)	Service Option (SO)	Channel	Frequency	Output Power (dBm) Average
RC3 (Fwd3, Rvs3)	SO32 (+F-SCH)	1013	824.70	24.80
		384	836.52	24.90
		777	848.31	24.95

PCS Band

Radio Configuration (RC)	Service Option (SO)	Channel	Frequency	Output Power (dBm) Average
RC3 (Fwd3, Rvs3)	SO32 (+F-SCH)	25	1851.25	24.90
		600	1880.00	24.80
		1175	1908.75	24.80

3G-CDMA2000 1xEV-DO Release 0 (Rel 0)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	A.06.06, L

FTAP

- Call Setup > Shift & Preset
- Protocol Rev > 0 (1xEV-DO)
- Application Config > Enhanced Test Application Protocol > FTAP
- FTAP Rate > 307.2 kbps (2 Slot, QPSK)
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RTAP

- Call Setup > Shift & Preset
- Protocol Rev > 0 (1xEV-DO)
- Application Config > Enhanced Test Application Protocol > RTAP
- RTAP Rate > 153.6 kbps
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

Worst-case Measurement Result @ Low, Middle and High Channel

Cellular Band - RTAP				Cellular Band - FTAP			
Channel	f (MHz)	RTAP Rate	Conducted power (dBm) Average	Channel	f (MHz)	FTAP Rate	Conducted power (dBm) Average
1013	824.70	153.6	24.80	1013	824.70	307.2 kbps (2 slot, QPSK)	24.45
384	836.52		24.92	384	836.52		24.50
777	848.31		24.86	777	848.31		24.43

PCS Band - RTAP				PCS Band - FTAP			
Channel	f (MHz)	RTAP Rate	Conducted power (dBm) Average	Channel	f (MHz)	FTAP Rate	Conducted power (dBm) Average
25	1851.25	153.6	24.80	25	1851.25	307.2 kbps (2 slot, QPSK)	24.65
600	1880.00		24.84	600	1880.00		24.56
1175	1908.75		24.80	1175	1908.75		24.50

Preliminary Measurement Results @ Middle channel

Cellular Band - RTAP					Cellular Band - FTAP				
			Conducted power (dBm)					Conducted power (dBm)	
Channel	f (MHz)	RTAP Rate	Average	Peak	Channel	f (MHz)	FTAP Rate	Average	Peak
384	836.52	9.6	24.66	29.85	384	836.52	307.2 kbps (2 slot, QPSK)	24.60	29.53
		19.2	24.72	29.87					
		38.4	24.75	29.90					
		76.8	24.78	30.00					
		153.6	24.92	30.01					

PCS Band - RTAP					PCS Band - FTAP				
			Conducted power (dBm)					Conducted power (dBm)	
Channel	f (MHz)	RTAP Rate	Average	Peak	Channel	f (MHz)	FTAP Rate	Average	Peak
600	1880.00	9.6	24.63	29.01	600	1880.00	307.2 kbps (2 slot, QPSK)	24.63	29.09
		19.2	24.64	29.03					
		38.4	24.70	29.11					
		76.8	24.75	29.28					
		153.6	24.84	29.30					

3G-CDMA2000 1xEV-DO Revision A (Rev A)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	A.06.06, L

FETAP

- Call Setup > Shift & Preset
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- FTAP Rate > 307.2 kbps (2 Slot, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 0
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RETAP

- Call Setup > Shift & Preset
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- R-Data Pkt Size > 4096 (for PCS band), 12288 (for Cellular band)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
  > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
  > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

Worst-case Measurement Result @ Low, Middle and High Channel

Cellular Band - RETAP				Cellular Band - FETAP			
Channel	f (MHz)	R-Data Pkt Size	Conducted power (dBm) Average	Channel	f (MHz)	FTAP Rate	Conducted power (dBm) Average
1013	824.70	4096	24.85	1013	824.70	307.2 (2 slot)	24.45
384	836.52		24.95	384	836.52		24.46
777	848.31		24.79	777	848.31		24.40

PCS Band - RETAP				PCS Band - FETAP			
Channel	f (MHz)	R-Data Pkt Size	Conducted power (dBm) Average	Channel	f (MHz)	FTAP Rate	Conducted power (dBm) Average
25	1851.25	4096	24.95	25	1851.25	307.2 (2 slot)	24.45
600	1880.00		24.92	600	1880.00		24.44
1175	1908.75		24.90	1175	1908.75		24.42

Preliminary Measurement Results @ Middle channel

Cellular Band - RETAP					Cellular Band - FETAP				
			Conducted power (dBm)					Conducted power (dBm)	
Channel	f (MHz)	R-Data Pkt Size	Average	Peak	Channel	f (MHz)	FTAP Rate	Average	Peak
384	836.52	128	23.90	30.14	384	836.52	307.2 (2 slot)	24.40	
		256	24	30.21			307.2 (4 slot)	24.37	
		512	24.10	30.28					
		768	24.27	30.33					
		1024	24.28	30.14					
		1536	24.32	30.35					
		2048	24.40	30.14					
		3072	24.70	30.56					
		4096	24.95	30.66					
		6144	23.60	30.37					
		8192	23.60	30.40					
		12288	23.70	30.38					

PCS Band – RETAP					PCS Band - FETAP				
			Conducted power (dBm)					Conducted power (dBm)	
Channel	f (MHz)	R-Data Pkt Size	Average	Peak	Channel	f (MHz)	FTAP Rate	Average	Peak
600	1880.00	128	24.10	28.91	600	1880	307.2 (2 slot)	24.40	
		256	24.16	29.20			307.2 (4 slot)	24.38	
		512	24.32	28.90					
		768	24.35	28.77					
		1024	24.50	28.76					
		1536	24.58	28.83					
		2048	24.60	28.86					
		3072	24.75	29.13					
		4096	24.92	29.29					
		6144	24.64	29.26					
		8192	24.68	29.24					
		12288	24.70	29.27					

The following procedures had been used to prepare the Atheros WLAN module for the SAR co-location testing.

The client provided a special driver and program, Art, which enables a user to control the frequency and output power of the module.

The cable assembly insertion loss of 20dB was entered as an offset in the power meter to allow for direct reading of power.

802.11b

Channel	Frequency (MHz)	Power (dBm)
Low	2412	17.0
Middle	2437	17.0
High	2462	17.0

802.11g

Channel	Frequency (MHz)	Power (dBm)
Low	2412	17.0
Middle	2437	17.0
High	2462	17.0

802.11a

Channel	Frequency (MHz)	Power (dBm)
Low	5180	16.0
Middle	5260	16.0
High	5320	16.0

Channel	Frequency (MHz)	Power (dBm)
Low	5500	16.0
Middle	5600	16.0
High	5700	16.0

Channel	Frequency (MHz)	Power (dBm)
Low	5745	16.0
Middle	5785	16.0
High	5825	16.0

The following procedures had been used to prepare the Intel WLAN module for the SAR co-location testing.

The client provided a special driver and program, CRTU, which enables a user to control the frequency and output power of the module.

2.4GHz Band

802.11g

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	2412	16.7	16.5
Middle	2437	17.6	17.6
High	2462	16.6	16.8

802.11n 20M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	2412	15.6	15.6
Middle	2437	15.6	15.6
High	2462	15.6	15.6

802.11n MIMO 20M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	2422	14.7	14.4
Middle	2437	14.6	14.4
High	2452	14.6	14.4

5.2GHz Band

802.11a

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5180	16.5	16.4
Middle	5260	17.5	17.6
High	5320	16.5	16.5

802.11n 20M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5180	17.5	17.5
Middle	5260	17.5	17.5
High	5320	16.6	16.5

802.11n 40M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5190	15.4	15.4
Middle	5270	17.4	17.5
High	5310	15.4	15.5

802.11n MIMO 20M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5180	12.6	12.5
Middle	5260	14.7	14.6
High	5320	14.6	14.4

802.11n MIMO 40M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5190	12.7	12.8
Middle	5270	14.6	14.7
High	5310	14.6	14.7

5.8GHz Band

802.11a

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5745	17.6	17.5
Middle	5785	17.6	17.6
High	5825	17.6	17.6

802.11n 20M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5745	17.6	17.5
Middle	5785	17.4	17.5
High	5825	17.5	17.5

802.11n 40M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5755	17.3	17.4
High	5795	17.6	17.5

802.11n 20M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5745	14.5	14.4
Middle	5785	14.5	14.5
High	5825	14.5	14.6

802.11n 40M

Channel	Frequency (MHz)	Average Power Chain A (dBm)	Average Power Chain B (dBm)
Low	5755	14.6	14.7
High	5795	14.6	14.6

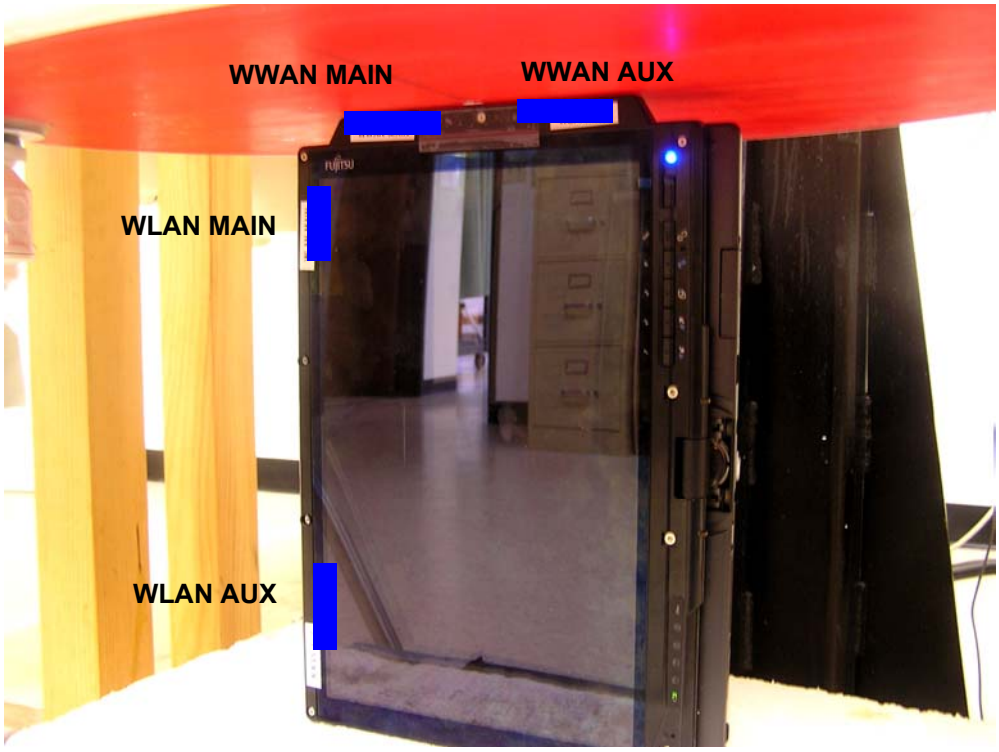
8 SAR MEASURMENT RESULTS

8.1 CELL BAND

8.1.1 TABLET - SECONDARY PORTRAIT POSITION

NOTE:

1) THE EUT WAS TESTED WITH THE WWAN MAIN ANTENNA TRANSMITTING
2) THIS POSITION WAS TESTED FOR CO-LOCATION DUE TO THE CLOSE PROXIMITY BETWEEN THE WWAN MAIN AND WLAN MAIN ANTENNAE. THE RESULTING SAR VALUE IS EVALUATED IN THE MULTI-BAND SECTION



Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
CDMA 1xRTT					
Secondary Portrait	1013	824.70	0.535	-0.178	0.557
	384	**836.52**	**0.683**	**0.000**	**0.683**
	777	848.31	0.650	0.000	0.650
CDMA 1xEV-DO Rel 0					
Secondary Portrait	384	836.52	0.630	0.000	0.630
CDMA 1xEV-DO Rev A					
Secondary Portrait	384	836.52	0.613	-0.115	0.629

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacture's instructions prior to SAR measurements.

8.1.2 TABLET - SECONDARY LANDSCAPE AND LAPHELD POSITIONS

NOTE:

1) 1XEV-DO REL 0 AND REV A TESTING WAS SKIPPED DUE TO LOWER SAR VALUES FROM THE SECONDARY PORTRAIT RESULTS.
2) THE SECONDARY LANDSCAPE POSITION WAS TESTED FOR CO-LOCATION DUE TO THE CLOSE PROXIMITY BETWEEN THE WWAN MAIN AND WLAN MAIN ANTENNAE. THE RESULTING SAR VALUE IS EVALUATED IN THE MULTI-BAND SECTION

Secondary Landscape Position

Lapheld Position

CDMA 1xRTT

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Secondary Landscape	1013 384 777	824.70 836.52 848.31	0.184	0.000	0.184
Lapheld	1013 384 777	824.70 836.52 848.31	0.381	0.000	0.381

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacture's instructions prior to SAR measurements.

8.1.3 TABLET - PRIMARY PORTRAIT AND PRIMARY LANDSCAPE POSITION

THE BELOW POSITIONS WERE SKIPPED DUE TO LOW SAR VALUES AND LARGE DISTANCE BETWEEN THE ANTENNA AND THE PHANTOM.

	
Primary Portrait Position	Primary Landscape Position

8.1.4 LAPTOP - NORMAL POSITION

1XEV-DO REL 0 AND REV A TESTING WAS SKIPPED DUE TO LOWER SAR VALUES FROM THE SECONDARY PORTRAIT RESULTS.

Normal

CDMA 1xRTT

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Normal	1013	824.70	0.054	0.000	0.054
	384	836.52			
	777	848.31			

Notes:

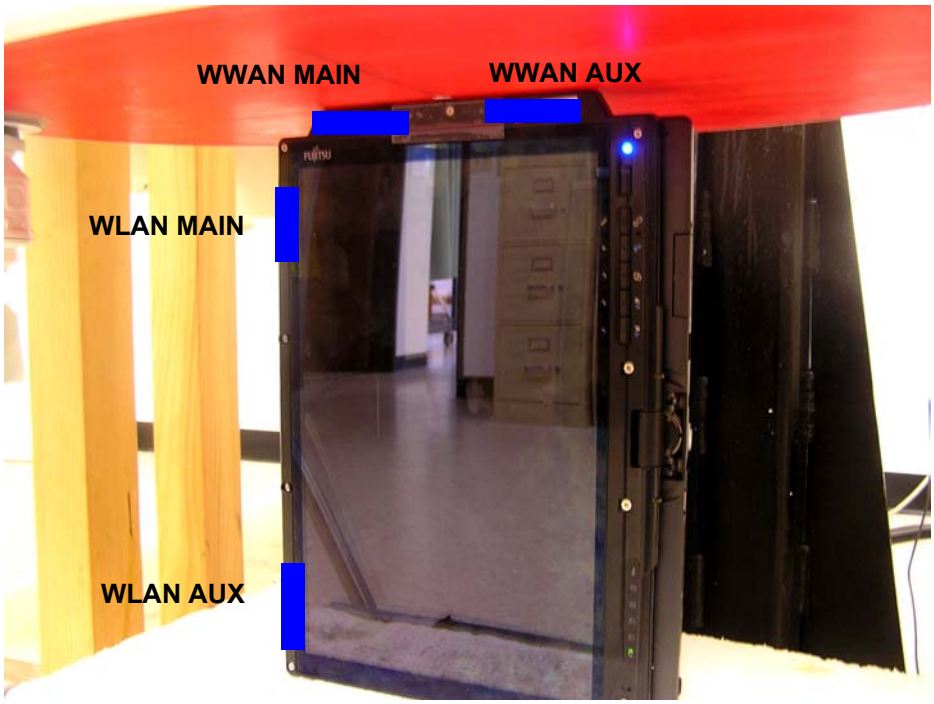
1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacture's instructions prior to SAR measurements.

8.2 PCS BAND

8.2.1 TABLET - SECONDARY PORTRAIT POSITION

NOTE:

1) THE EUT WAS TESTED WITH THE WWAN MAIN ANTENNA TRANSMITTING
2) THIS POSITION WAS TESTED FOR CO-LOCATION DUE TO THE CLOSE PROXIMITY BETWEEN THE WWAN MAIN AND WLAN MAIN ANTENNAE. THE RESULTING SAR VALUE IS EVALUATED IN THE MULTI-BAND SECTION



Secondary Portrait Position

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
CDMA 1xRTT					
Secondary Portrait	25	1851.25	0.586	-0.115	0.602
	600	**1880.00**	**0.742**	**0.000**	**0.742**
	1175	1908.75	0.716	-0.069	0.727
CDMA 1xEV-DO Rel 0					
Secondary Portrait	600	1880.00	0.717	-0.092	0.732
CDMA 1xEV-DO Rev A					
Secondary Portrait	600	1880.00	0.672	0.000	0.672

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacture's instructions prior to SAR measurements.

8.2.2 TABLET - SECONDARY LANDSCAPE AND LAPHELD POSITIONS

NOTE:

1) 1XEV-DO REL 0 AND REV A TESTING WAS SKIPPED DUE TO LOWER SAR VALUES FROM THE SECONDARY PORTRAIT RESULTS.
2) THE SECONDARY LANDSCAPE POSITION WAS TESTED FOR CO-LOCATION DUE TO THE CLOSE PROXIMITY BETWEEN THE WWAN MAIN AND WLAN MAIN ANTENNAE. THE RESULTING SAR VALUE IS EVALUATED IN THE MULTI-BAND SECTION

Secondary Landscape Position

Lapheld Position

CDMA 1xRTT

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Secondary Landscape	25 600 1175	1851.25 1880.00 1908.75	0.272	0.000	0.272
Lapheld	25 600 1175	1851.25 1880.00 1908.75	0.141	0.000	0.141

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacture's instructions prior to SAR measurements.

8.2.3 LAPTOP - NORMAL POSITION

1XEV-DO REL 0 AND REV A TESTING WAS SKIPPED DUE TO LOWER SAR VALUES FROM THE SECONDARY PORTRAIT RESULTS

Nomal

CDMA 1xRTT					
Test Position	**Channel**	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
Normal	25 600 1175	1851.25 1880.00 1908.75	0.032	0.000	0.032

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacture's instructions prior to SAR measurements.

8.3 MULTI-BAND EVALUATIONS

8.3.1 WORST CASE CONFIUGURATIONS

The following SAR results are from the previous zoom scans in order to determine the worst case:

Frequency Band	Test Position	Ch	f (MHz)	Zoom Scan SAR 1g (mW/g)
CDMA2000 1xRTT (Part 22 Cell Band)	Secondary Landscape	384	836.52	0.184
CDMA2000 1xRTT (Part 22 Cell Band)	Secondary Portrait	384	836.52	0.683
CDMA2000 1xRTT (Part 24 PCS Band)	Secondary Landscape	600	1880.00	0.272
CDMA2000 1xRTT (Part 24 PCS Band)	Secondary Portrait	600	1880.00	0.742

The following SAR values are evaluated in the same frequency & position in two different liquids using Dasy4 Multi-Band method in order to use SEMCAD tool to evaluate the combined SAR.

Note: The Bluetooth module was not included in the multi-band calculations due to lower output power and the large distance between the Bluetooth antenna and the WWAN main antenna.

8.3.2 MULTI-BAND SAR RESULTS-CELL BAND

CDMA2000 Cell Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	836.5	0.176
WLAN - Atheros	Secondary Landscape	2437	0.810
	Combined 1g SAR Value:		**0.855**

CDMA2000 Cell Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	836.5	0.576
WLAN - Atheros	Secondary Portrait	2437	0.077
	Combined 1g SAR Value:		**0.662**

CDMA2000 Cell Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	836.5	0.176
WLAN - Intel	Secondary Landscape	2437	0.192
	Combined 1g SAR Value:		**0.375**

CDMA2000 Cell Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	836.5	0.576
WLAN - Intel	Secondary Portrait	2437	0.092
	Combined 1g SAR Value:		**0.611**

8.3.3 MULTI-BAND SAR RESULTS-PCS BAND

CDMA2000 PCS Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	1880	0.359
WLAN - Atheros	Secondary Landscape	2437	0.810
	Combined 1g SAR Value:		**0.923**

CDMA2000 PCS Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	1880	0.600
WLAN - Atheros	Secondary Portrait	2437	0.077
	Combined 1g SAR Value:		**0.680**

CDMA2000 PCS Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	1880	0.359
WLAN - Intel	Secondary Landscape	2437	0.192
	Combined 1g SAR Value:		**0.419**

CDMA2000 PCS Band with 2.4 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	1880	0.600
WLAN - Intel	Secondary Portrait	2437	0.092
	Combined 1g SAR Value:		**0.635**

8.3.4 MULTI-BAND SAR RESULTS-CELL BAND

CDMA2000 Cell Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	836.5	0.176
WLAN - Atheros	Secondary Landscape	5825	0.403
		Combined 1g SAR Value:	**0.562**

CDMA2000 Cell Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	836.5	0.576
WLAN - Atheros	Secondary Portrait	5825	0.007
		Combined 1g SAR Value:	**0.471**

CDMA2000 Cell Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	836.5	0.176
WLAN - Intel	Secondary Landscape	5785	0.185
		Combined 1g SAR Value:	**0.337**

CDMA2000 Cell Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	836.5	0.576
WLAN - Intel	Secondary Portrait	5785	0.003
		Combined 1g SAR Value:	**0.579**

8.3.5 MULTI-BAND SAR RESULTS-PCS BAND

CDMA2000 PCS Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	1880	0.189
WLAN - Atheros	Secondary Landscape	5825	0.403
	Combined 1g SAR Value:		**0.438**

CDMA2000 PCS Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	1880	0.605
WLAN - Atheros	Secondary Portrait	5825	0.007
	Combined 1g SAR Value:		**0.608**

CDMA2000 PCS Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Landscape	1880	0.189
WLAN - Intel	Secondary Landscape	5785	0.185
	Combined 1g SAR Value:		**0.350**

CDMA2000 PCS Band with 5.8 GHz WLAN

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
CDMA2000	Secondary Portrait	1880	0.605
WLAN - Intel	Secondary Portrait	5785	0.003
	Combined 1g SAR Value:		**0.609**

9 MEASURMENT UNCERTAINTY

9.1 MEASURMENT UNCERTAINTY FOR 300 MHz – 3000 MHz

Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)	
						Ui (1g)	Ui(10g)
Measurement System							
Probe Calibration	4.80	N	1	1	1	4.80	4.80
Axial Isotropy	4.70	R	1.732	0.707	0.707	1.92	1.92
Hemispherical Isotropy	9.60	R	1.732	0.707	0.707	3.92	3.92
Boundary Effects	1.00	R	1.732	1	1	0.58	0.58
Linearity	4.70	R	1.732	1	1	2.71	2.71
System Detection Limits	1.00	R	1.732	1	1	0.58	0.58
Readout Electronics	1.00	N	1	1	1	1.00	1.00
Response Time	0.80	R	1.732	1	1	0.46	0.46
Integration Time	2.60	R	1.732	1	1	1.50	1.50
RF Ambient Conditions - Noise	1.59	R	1.732	1	1	0.92	0.92
RF Ambient Conditions - Reflections	0.00	R	1.732	1	1	0.00	0.00
Probe Positioner Mechnical Tolerance	0.40	R	1.732	1	1	0.23	0.23
Probe Positioning With Respect to Phantom Shell	2.90	R	1.732	1	1	1.67	1.67
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	3.90	R	1.732	1	1	2.25	2.25
Test sample Related							
Test Sample Positioning	1.10	N	1	1	1	1.10	1.10
Device Holder Uncertainty	3.60	N	1	1	1	3.60	3.60
Power and SAR Drift Measurement	5.00	R	1.732	1	1	2.89	2.89
Phantom and Tissue Parameters							
Phantom Uncertainty	4.00	R	1.732	1	1	2.31	2.31
Liquid Conductivity - Target	5.00	R	1.732	0.64	0.43	1.85	1.24
Liquid Conductivity - Meas.	8.60	N	1	0.64	0.43	5.50	3.70
Liquid Permittivity - Target	5.00	R	1.732	0.6	0.49	1.73	1.41
Liquid Permittivity - Meas.	3.30	N	1	0.6	0.49	1.98	1.62
Combined Standard Uncertainty	RSS					11.44	10.49
Expanded Uncertainty (95% Confidence Interval)	K=2					22.87	20.98

Notesfor table
1. Tol. - tolerance in influence quaitity
2. N - Nomal
3. R - Rectangular
4. Div. - Divisor used to obtain standard uncertainty
5. Ci - is te sensitivity coefficient

9.2 MEASURMENT UNCERTAINTY 3 GHz – 6 GHz

Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)	
						Ui (1g)	Ui(10g)
Measurement System							
Probe Calibration	4.80	N	1	1	1	4.80	4.80
Axial Isotropy	4.70	R	1.732	0.707	0.707	1.92	1.92
Hemispherical Isotropy	9.60	R	1.732	0.707	0.707	3.92	3.92
Boundary Effects	1.00	R	1.732	1	1	0.58	0.58
Linearity	4.70	R	1.732	1	1	2.71	2.71
System Detection Limits	1.00	R	1.732	1	1	0.58	0.58
Readout Electronics	1.00	N	1	1	1	1.00	1.00
Response Time	0.80	R	1.732	1	1	0.46	0.46
Integration Time	2.60	R	1.732	1	1	1.50	1.50
RF Ambient Conditions - Noise	3.00	R	1.732	1	1	1.73	1.73
RF Ambient Conditions - Reflections	3.00	R	1.732	1	1	1.73	1.73
Probe Positioner Mechnical Tolerance	0.40	R	1.732	1	1	0.23	0.23
Probe Positioning With Respect to Phantom Shell	2.90	R	1.732	1	1	1.67	1.67
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	3.90	R	1.732	1	1	2.25	2.25
Test sample Related							
Test Sample Positioning	1.10	N	1	1	1	1.10	1.10
Device Holder Uncertainty	3.60	N	1	1	1	3.60	3.60
Power and SAR Drift Measurement	5.00	R	1.732	1	1	2.89	2.89
Phantom and Tissue Parameters							
Phantom Uncertainty	4.00	R	1.732	1	1	2.31	2.31
Liquid Conductivity - Target	5.00	R	1.732	0.64	0.43	1.85	1.24
Liquid Conductivity - Meas.	8.60	N	1	0.64	0.43	5.50	3.70
Liquid Permittivity - Target	5.00	R	1.732	0.6	0.49	1.73	1.41
Liquid Permittivity - Meas.	3.30	N	1	0.6	0.49	1.98	1.62
Combined Standard Uncertainty	RSS					11.66	10.73
Expanded Uncertainty (95% Confidence Interval)	K=2					23.32	21.46

Notesfor table
1. Tol. - tolerance in influence quaitity
2. N - Nomal
3. R - Rectangular
4. Div. - Divisor used to obtain standard uncertainty
5. Ci - is te sensitivity coefficient

10 EQUIPMENT LIST AND CALIBRATION

Name of Equipment	Manufacturer	Type/Model	Serial Number	Cal. Due date		
				MM	DD	Year
Robot - Six Axes	Stäubli	RX90BL	N/A		N/A	
Robot Remote Control	Stäubli	CS7MB	3403-91535		N/A	
DASY4 Measurement Server	SPEAG	SEUMS001BA	1041		N/A	
Probe Alignment Unit	SPEAG	LB (V2)	261		N/A	
SAM Phantom (SAM1)	SPEAG	QD000P40CA	1185		N/A	
SAM Phantom (SAM2)	SPEAG	QD000P40CA	1050		N/A	
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 B	1003		N/A	
Electronic Probe kit	HP	85070C	N/A		N/A	
S-Parameter Network Analyzer	Agilent	8753ES-6	US39173569	11	14	2008
E-Field Probe	SPEAG	EX3DV4	3554	4	24	2008
Thermometer	ERTCO	639-1S	1718	8	30	2008
Data Acquisition Electronics	SPEAG	DAE3 V1	500	11	16	2008
System Validation Dipole	SPEAG	D835V2	4d002	6	22	2009
System Validation Dipole	SPEAG	D1900V2	5d043	1	29	2010
System Validation Dipole	SPEAG	D2450V2	706	4	27	2008
System Validation Dipole	SPEAG	D5GHzV2	1003	11	21	2009
Signal Generator	R&S	SMP 04	DE34210	2	16	2009
Power Meter	Giga-tronics	8651A	8651404	4	3	2008
Power Sensor	Giga-tronics	80701A	1834588	4	17	2008
Amplifier	Mini-Circuits	ZVE-8G	360		N/A	
Amplifier	Mini-Circuits	ZHL-42W	D072701-5		N/A	
Radio Communication Tester	Agilent	E5515C	GB46160222	6	29	2008
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M2450	N/A	Within 24 hrs of first test		
Simulating Liquid	SPEAG	M5200-5800	N/A	Within 24 hrs of first test		

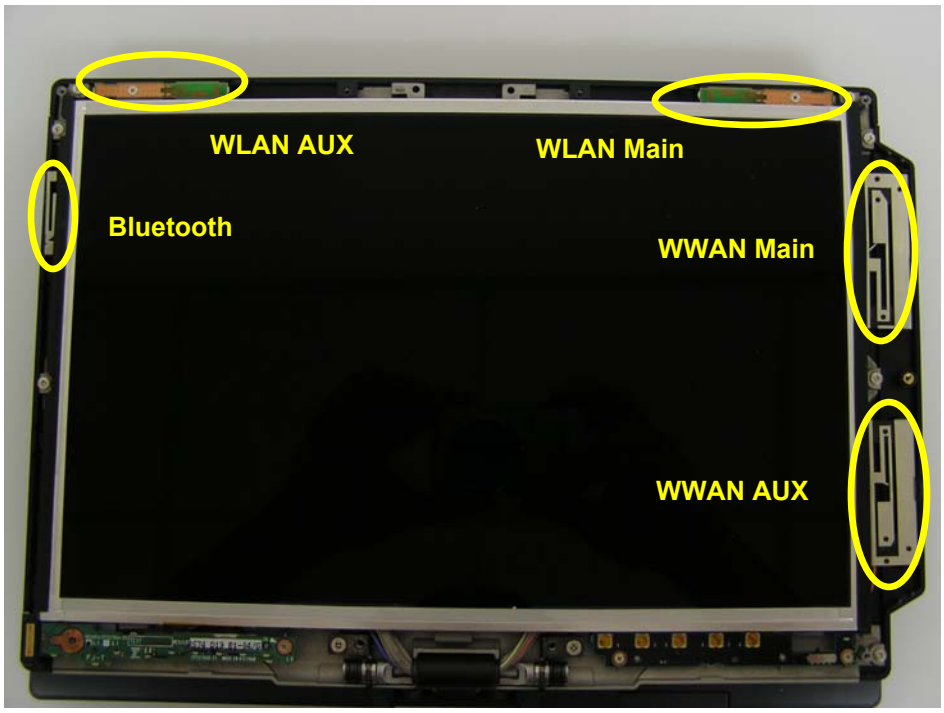
11 ATTACHMENTS

No.	Contents	No. Of Pages
1	System Performance Check Plots	8
2-1	SAR Test Plots – Cell Band	9
2-2	SAR Test Plots – PCS Band	9
2-3	SAR Test Plots – Multi Band – 2.4 GHz Band	16
2-4	SAR Test Plots – Multi Band – 5.8 GHz Band	16
3	Certificate of E-Field Probe - EX3DV4SN3554	10
4	Certificate of System Validation Dipole - D835V2 SN:4d002	9
5	Certificate of System Validation Dipole - D1900V2 SN:5d043	9
6	Certificate of System Validation Dipole - D2450 SN:706	9
7	Certificate of System Validation Dipole - D5GHzV2 SN:1003	15

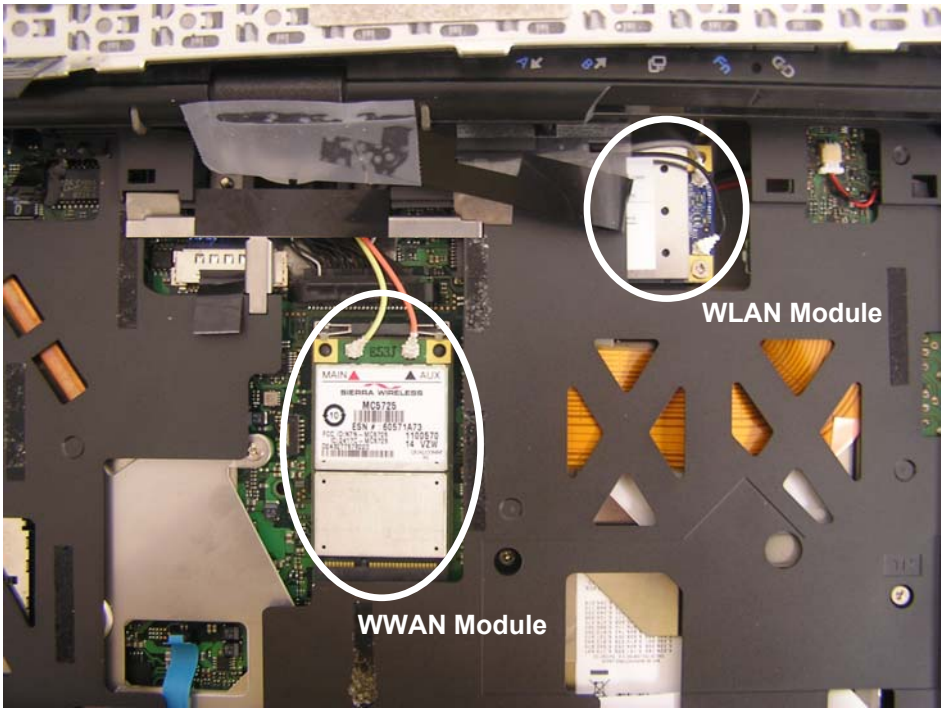
12 PHOTOS

Host Device - Fujitsu T2010 Tablet computer

Antenna locations

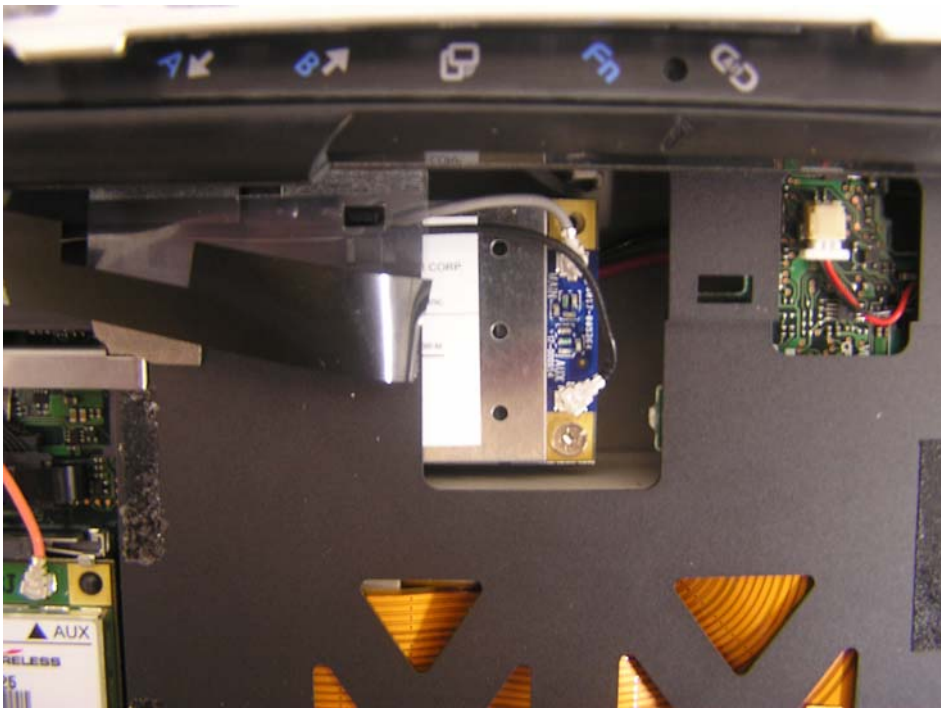


EUT Location



Sierra Wireless WWAN Module FCC ID: N7N-MC5725-F

Atheros Module FCC ID: PPD-AR5BXB6-M



Intel Module FCC ID: PD94965AGN

END OF REPORT