SAR Evaluation Report

IN ACCORDANCE WITH THE REQUIREMENTS OF
FCC OET BULLETIN 65 SUPPLEMENT C
IC RSS 102 ISSUE 1 : 1999

FOR

WIRELESS USB CDMA MODEM MODULE

MODEL: AC595U

FCC ID: N7N-MC5725U
IC: 2417C-MC5725U

REPORT NUMBER: 06U10743-6

ISSUE DATE: FEBRUARY 5, 2007

Prepared for

SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92010

Prepared by

COMPLIANCE CERTIFICATION SERVICES
47173 BENICIA STREET,
FREMONT, CA 94538 USA

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issued date	Revisions	Revised By
--	February 5, 2007	Initial issue	HS

CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

DATES OF TEST: January 26, 29, 30 and 31 2007

APPLICANT: ADDRESS:	Sierra Wireless 2290 Cosmos Ct. Carlsbad, CA 92010
FCC ID: MODEL:	N7N-MC5725U AC595U
DEVICE CATEGORY: EXPOSURE CATEGORY:	Portable Device General Population/Uncontrolled Exposure

Wireless USB CDMA Modem Module is installed in three host laptops for SAR evaluation.

Test Sample is a:	Production unit		
Host Laptops:	1) Panasonic CF-29 2) Sony Vaio VGN-C140G 3) Toshiba Satellite P10		
Rule Parts	Frequency Range [MHz]	The Highest SAR Values [1g_mW/g]	
FCC 22H	824.7 - 848.31	1) Panasonic CF-29 2) Sony Vaio VGN-C140G 3) Toshiba Satellite P10	0.535 **0.890** 0.725
FCC 24E	1851.25 - 1908.75	1) Panasonic CF-29 2) Sony Vaio VGN-C140G 3) Toshiba Satellite P10	**1.240** 1.068 0.981

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

Hsin Fu Shih
Engineering Supervisor
Compliance Certification Services

Tested By:

Ninous Davoudi

Ninous Davoudi
EMC Engineer
Compliance Certification Services

TABLE OF CONTENTS

1 EQUIPMENT UNDER TEST (EUT) DESCRIPTION

Wireless USB CDMA Modem Module is installed in three host laptops for SAR evaluation.	
Normal operation:	Lap-held position
Duty cycle:	100%
Host Device(s):	1) Panasonic CF-29 2) Sony Vaio VGN-C140G 3) Toshiba Satellite P10
Power supply:	Through USB port assisted by LI – Polymer Battery, Model # SM-125, 3.7V, 380mAh

2 FACILITIES AND ACCREDITATION

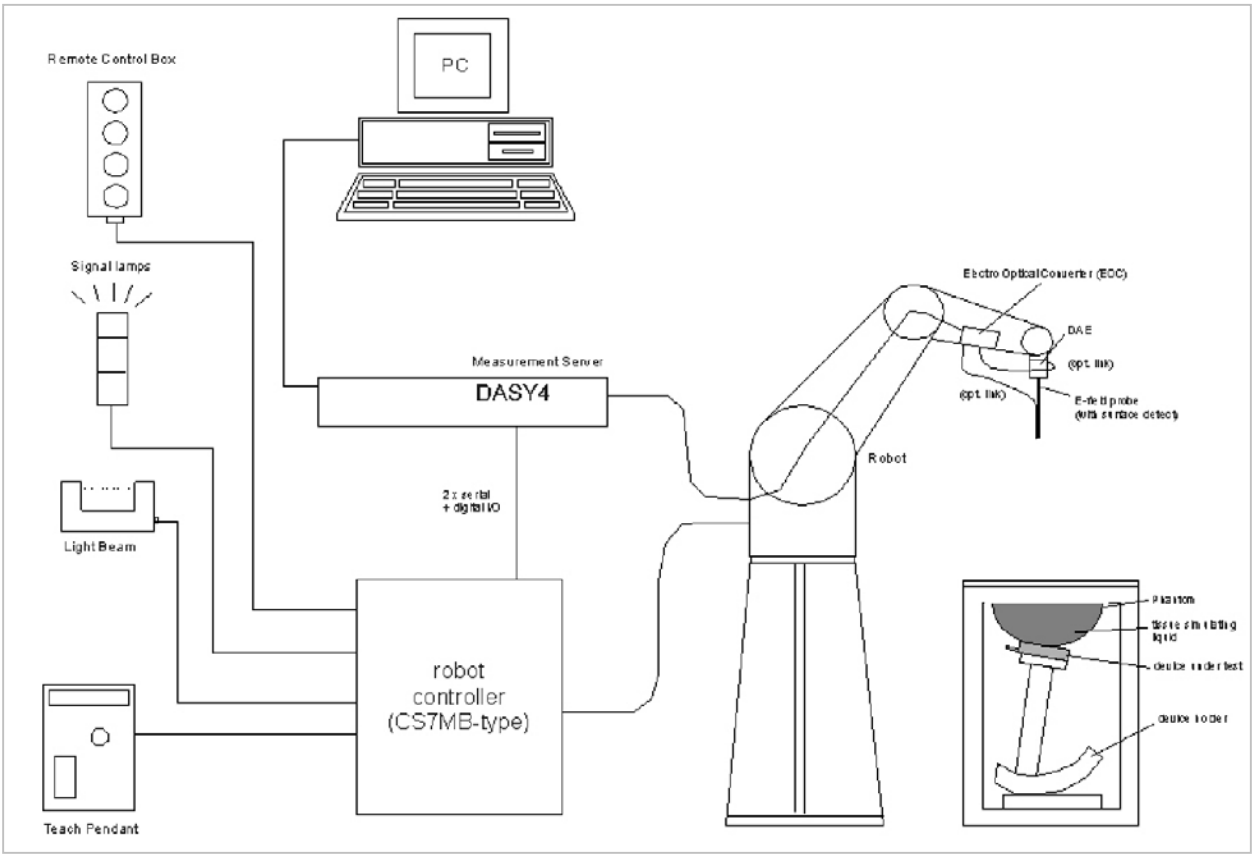
The test sites and measurement facilities used to collect data are located at 47173 BENICIA STREET, FREMONT, CA 94538 USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio 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.

No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

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

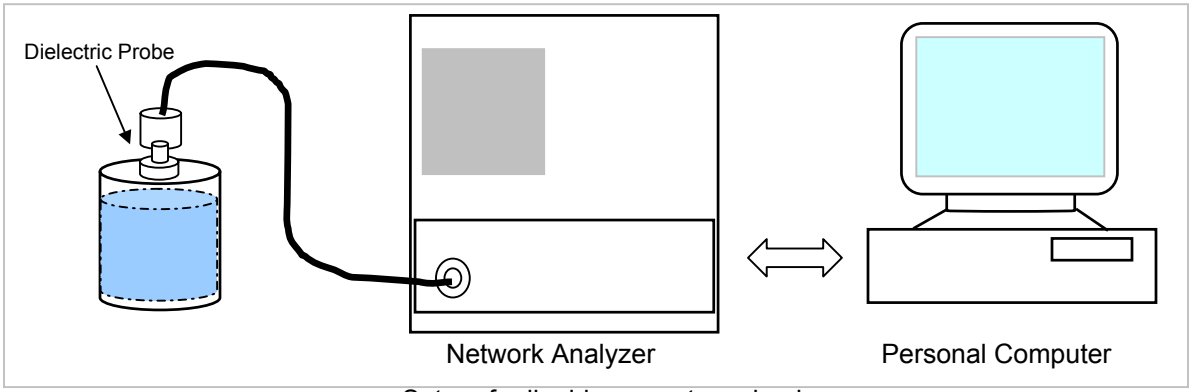
The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

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 = 22°C; Relative humidity = 40% Measured by: Ninous Davoudi

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
835	21	15	e'	53.3749	Relative Permittivity (ϵ_r):	53.3749	55.2	-3.31	± 5
			e"	20.7252	Conductivity (σ):	0.96273	0.97	-0.75	± 5

Liquid Check
Ambient temperature: 22.0 deg. C; Liquid temperature: 21.0 deg C
January 30, 2007 08:47 AM

Frequency	e'	e"
750000000.	54.3343	20.9698
755000000.	54.2829	20.9408
760000000.	54.1973	20.9118
765000000.	54.1343	20.8757
770000000.	54.0693	20.8992
775000000.	54.0019	20.8769
780000000.	53.9219	20.8477
785000000.	53.8742	20.8079
790000000.	53.8314	20.8127
795000000.	53.7485	20.7971
800000000.	53.7247	20.7839
805000000.	53.6715	20.7811
810000000.	53.6322	20.7342
815000000.	53.6027	20.7289
820000000.	53.5527	20.7254
825000000.	53.4925	20.7366
830000000.	53.4216	20.7297
835000000.	**53.3749**	**20.7252**
840000000.	53.3090	20.6951
845000000.	53.2705	20.6771
850000000.	53.2233	20.6625
855000000.	53.1676	20.6512
860000000.	53.0894	20.6054
865000000.	53.0265	20.5975
870000000.	52.9600	20.5485
875000000.	52.9015	20.5183
880000000.	52.8487	20.5286
885000000.	52.8084	20.5132
890000000.	52.7689	20.4976
895000000.	52.7289	20.4511
900000000.	52.7186	20.4662

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 Parameters Check Result @ Muscle 835 MHz

Room Ambient Temperature = 22°C; Relative humidity = 40% Measured by: Ninous Davoudi

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
835	21	15	e'	53.1785	Relative Permittivity (ϵ_r):	53.1785	55.2	-3.66	± 5
			e"	20.5766	Conductivity (σ):	0.95583	0.97	-1.46	± 5

Liquid Check
Ambient temperature: 22.0 deg. C; Liquid temperature: 21.0 deg C
January 31, 2007 09:16 AM

Frequency	e'	e"
750000000.	54.0804	20.9225
755000000.	54.0234	20.8729
760000000.	53.9639	20.8482
765000000.	53.9127	20.8445
770000000.	53.8592	20.8300
775000000.	53.8033	20.8048
780000000.	53.7243	20.7763
785000000.	53.6638	20.7305
790000000.	53.6117	20.7396
795000000.	53.5334	20.7348
800000000.	53.4935	20.7058
805000000.	53.4645	20.6731
810000000.	53.4096	20.6441
815000000.	53.3762	20.6414
820000000.	53.3173	20.6422
825000000.	53.2904	20.6206
830000000.	53.2182	20.5933
835000000.	**53.1785**	**20.5766**
840000000.	53.1143	20.5800
845000000.	53.0608	20.5795
850000000.	53.0397	20.5457
855000000.	52.9682	20.5198
860000000.	52.9227	20.4739
865000000.	52.8485	20.4926
870000000.	52.7897	20.4631
875000000.	52.7412	20.4302
880000000.	52.7029	20.3937
885000000.	52.6275	20.4241
890000000.	52.6266	20.4262
895000000.	52.5907	20.3894
900000000.	52.5262	20.3845

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 Parameters Check Result @ Muscle 1900 MHz

Room Ambient Temperature = 22°C; Relative humidity = 33% Measured by: Ninous Davoudi

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
1900	21	15	e'	54.792	Relative Permittivity (ϵ_r):	54.7920	53.3	2.80	± 5
			e"	14.2450	Conductivity (σ):	1.50569	1.52	-0.94	± 5

Liquid Check
Ambient temperature: 22.0 deg. C; Liquid temperature: 21.0 deg C
January 26, 2007 08:08 AM

Frequency	e'	e"
1710000000.	55.4681	13.4532
1720000000.	55.4211	13.4949
1730000000.	55.3739	13.5294
1740000000.	55.3655	13.5753
1750000000.	55.3163	13.6234
1760000000.	55.2542	13.6456
1770000000.	55.2279	13.6928
1780000000.	55.1954	13.7306
1790000000.	55.1502	13.7765
1800000000.	55.1338	13.8226
1810000000.	55.0893	13.8272
1820000000.	55.0673	13.8826
1830000000.	55.0177	13.9339
1840000000.	54.9933	13.9695
1850000000.	54.9540	14.0268
1860000000.	54.9343	14.0586
1870000000.	54.8790	14.1018
1880000000.	54.8517	14.1563
1890000000.	54.8128	14.1886
1900000000.	**54.7920**	**14.2450**
1910000000.	54.7387	14.2771

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 Parameters Check Result @ Muscle 1900 MHz

Room Ambient Temperature = 22°C; Relative humidity = 45% Measured by: Ninous Davoudi

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
1900	21	15	e'	54.181	Relative Permittivity (ϵ_r):	54.1810	53.3	1.65	± 5
			e"	14.8650	Conductivity (σ):	1.57122	1.52	3.37	± 5

Liquid Check
Ambient temperature: 22.0 deg. C; Liquid temperature: 21.0 deg C
January 29, 2007 08:46 AM

Frequency	e'	e"
1710000000.	54.9256	14.1495
1720000000.	54.8638	14.1950
1730000000.	54.8450	14.2265
1740000000.	54.7843	14.2981
1750000000.	54.7572	14.3146
1760000000.	54.7027	14.3403
1770000000.	54.6778	14.3630
1780000000.	54.6452	14.4000
1790000000.	54.5812	14.4540
1800000000.	54.5417	14.4866
1810000000.	54.4812	14.5348
1820000000.	54.4555	14.5819
1830000000.	54.3861	14.6316
1840000000.	54.3453	14.6857
1850000000.	54.3148	14.7158
1860000000.	54.3079	14.7208
1870000000.	54.3025	14.7655
1880000000.	54.2621	14.7944
1890000000.	54.2244	14.8398
1900000000.	**54.1810**	**14.8650**
1910000000.	54.1160	14.8889

The conductivity (σ) can be given as:

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

where $f = target\ f * 10^6$

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

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: 3531 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.
  For 5 GHz band - The coarse grid with a grid spacing of 10 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).
  For 5 GHz band - Special 8x8x8 fine cube was chosen for cube integration(dx=dy=4.3mm; dz=3mm)
- Distance between probe sensors and phantom surface was set to 4 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.0mm
- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

Reference SAR Values for body-tissue

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.

5.1 SYSTEM PERFORMANCE CHECK RESULTS

System Validation Dipole: D835V2 SN:4d002

Date: January 30, 2007

Room Ambient Temperature = 22°C; Relative humidity = 40% Measured by: Ninous Davoudi

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
835	21	15	1g	2.60	10.4	9.71	7.11	± 10
			10g	1.72	6.88	6.38	7.84	± 10

Date: January 31, 2007

Room Ambient Temperature = 22°C; Relative humidity = 40% Measured by: Ninous Davoudi

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
835	21	15	1g	2.62	10.48	9.71	7.93	± 10
			10g	1.73	6.92	6.38	8.46	± 10

System Validation Dipole: D1900V2 SN:5d043

Date: January 26, 2007

Room Ambient Temperature = 22°C; Relative humidity = 33% Measured by: Ninous Davoudi

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
1900	21	15	1g	9.25	37	39.8	-7.04	± 10
			10g	4.82	19.28	20.8	-7.31	± 10

Date: January 29, 2007

Room Ambient Temperature = 22°C; Relative humidity = 45% Measured by: Ninous Davoudi

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
1900	21	15	1g	9.75	39	39.8	-2.01	± 10
			10g	5.09	20.36	20.8	-2.12	± 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.

b) The SAR distribution at the exposed flat section of the flat phantom is measured at a distance of 4 mm from the inner surface of the shell. The area covers the entire dimension of the 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.

For 5 GHz band - The SAR distribution at the exposed flat section of the flat phantom is measured at a distance of 2.0 mm from the inner surface of the shell. The area covers the entire dimension of the EUT and the horizontal grid spacing is 10 mm x 10 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.

c) 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:

For 5 GHz band - Around this point, a volume of X=Y=24 and Z=20 mm is assessed by measuring 7 x 7 x 9 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.

For 5 GHz band – Same as above except the Zoom Scan measures 7 x 7 x 9 points.

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.

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	Peak
RC3 (Fwd3, Rvs3)	SO32 (+F-SCH)	1013	824.70	24.84	29.55
		384	836.52	**24.85**	**29.59**
		777	848.31	24.80	29.51

PCS Band

Radio Configuration (RC)	Service Option (SO)	Channel	Frequency	Output Power (dBm)	
				Average	Peak
RC3 (Fwd3, Rvs3)	SO32 (+F-SCH)	25	1851.25	24.65	28.37
		600	1880.00	**25.00**	**28.80**
		1175	1908.75	24.75	28.03

3G-CDMA2000 1xRTT

Preliminary Measurement Results @ Middle channel

Radio Configuration (RC)	Service Option (SO)	Output Power (dBm)			
		Cellular Band @ M-ch		PCS Band @ M-ch	
		Average	Peak	Average	Peak
RC1 (Fwd1, Rvs1)	1 (Voice)				
	2 (Loopback)	24.79	29.55	24.93	28.78
	3 (Voice)				
	55 (Loopback)	24.80	29.55	24.95	28.51
RC2 (Fwd2, Rvs2)	9 (Loopback)	24.81	29.56	24.95	28.41
	17 (Voice)				
	55 (Loopback)	24.60	29.50	24.96	28.77
RC3 (Fwd3, Rvs3)	1 (Voice)				
	2 (Loopback)	24.77	29.53	24.97	28.78
	3 (Voice)				
	55 (Loopback)	24.82	29.55	24.99	28.63
	32 (+ F-SCH)	**24.85**	**29.59**	**25.00**	**28.80**
	32 (+ SCH)	24.35	29.09	24.50	28.38
RC43 (Fwd4, Rvs3)	1 (Voice)				
	2 (Loopback)	24.72	29.54	24.97	28.62
	3 (Voice)				
	55 (Loopback)	24.75	29.42	24.95	28.75
	32 (+ F-SCH)	24.79	29.47	24.97	28.78
	32 (+ SCH)	24.30	28.94	24.49	28.52
RC54 (Fwd5, Rvs4)	9 (Loopback)	24.77	29.48	24.95	28.76
	17 (Voice)				
	55 (Loopback)	24.80	29.58	24.97	28.77

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**				
			Conducted power (dBm)					Conducted power (dBm)	
Channel	f (MHz)	RTAP Rate	Average	Peak	Channel	f (MHz)	FTAP Rate	Average	Peak
1013	824.70	153.6	24.69	29.72	1013	824.70	307.2 kbps (2 slot, QPSK)	24.57	29.69
384	836.52		**24.80**	**29.99**	384	836.52		24.60	29.93
777	848.31		24.75	29.28	777	848.31		24.53	29.42

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
25	1851.25	153.6	24.47	28.05	25	1851.25	307.2 kbps (2 slot, QPSK)	24.25	28.69
600	1880.00		24.70	28.60	600	1880.00		24.63	28.69
1175	1908.75		24.68	28.25	1175	1908.75		24.46	28.11

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

Preliminary Measurement Results @ Middle channel

Cellular Band - RTAP					Cellular Band - FTAP				
Channel	f (MHz)	RTAP Rate	Conducted power (dBm)		Channel	f (MHz)	FTAP Rate	Conducted power (dBm)	
			Average	Peak				Average	Peak
384	836.52	9.6	24.46	29.78	384	836.52	307.2 kbps (2 slot, QPSK)	24.60	29.93
		19.2	24.62	29.83					
		38.4	24.65	29.85					
		76.8	24.70	29.87					
		153.6	**24.80**	**29.99**					

PCS Band - RTAP					PCS Band - FTAP				
Channel	f (MHz)	RTAP Rate	Conducted power (dBm)		Channel	f (MHz)	FTAP Rate	Conducted power (dBm)	
			Average	Peak				Average	Peak
600	1880.00	9.6	24.43	28.49	600	1880.00	307.2 kbps (2 slot, QPSK)	24.63	28.69
		19.2	24.54	28.53					
		38.4	24.60	28.55					
		76.8	24.65	28.58					
		153.6	24.70	28.60					

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**				
			Conducted power (dBm)					Conducted power (dBm)	
Channel	f (MHz)	R-Data Pkt Size	Average	Peak	Channel	f (MHz)	FTAP Rate	Average	Peak
1013	824.70	12288	24.80	29.88	1013	824.70	307.2 (2 slot)	24.63	29.79
384	836.52		**24.85**	**30.19**	384	836.52		24.64	30.06
777	848.31		24.79	29.54	777	848.31		24.55	29.43

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
25	1851.25	4096	24.60	29.38	25	1851.25	307.2 (2 slot)	24.10	28.36
600	1880.00		**24.94**	**29.70**	600	1880.00		24.65	28.99
1175	1908.75		24.45	28.76	1175	1908.75		24.06	28.10

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

Preliminary Measurement Results @ Middle channel

Cellular Band - RETAP					Cellular Band - FETAP				
Channel	f (MHz)	R-Data Pkt Size	Conducted power (dBm)		Channel	f (MHz)	FTAP Rate	Conducted power (dBm)	
			Average	Peak				Average	Peak
384	836.52	128	24.20	29.44	384	836.52	307.2 (2 slot)	24.64	29.96
		256	24.37	29.46			307.2 (4 slot)	24.60	30.01
		512	24.43	29.80					
		768	24.50	29.82					
		1024	24.52	30.00					
		1536	24.52	29.93					
		2048	24.53	29.94					
		3072	24.62	30.03					
		4096	24.65	30.04					
		6144	24.67	30.15					
		8192	24.72	30.16					
		12288	**24.85**	**30.19**					

PCS Band - RETAP					PCS Band - FETAP				
Channel	f (MHz)	R-Data Pkt Size	Conducted power (dBm)		Channel	f (MHz)	FTAP Rate	Conducted power (dBm)	
			Average	Peak				Average	Peak
600	1880.00	128	24.57	29.10	600	1880	307.2 (2 slot)	24.65	28.99
		256	24.57	29.06			307.2 (4 slot)	24.61	28.94
		512	24.61	29.24					
		768	24.68	29.30					
		1024	24.78	29.35					
		1536	24.83	29.49					
		2048	24.85	29.52					
		3072	24.87	29.63					
		4096	**24.94**	**29.70**					
		6144	24.89	29.65					
		8192	24.92	29.69					
		12288	24.88	29.65					

8 SAR MEASURMENT RESULTS

8.1 CELL BAND

8.1.1 PANASONIC

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.483	-0.114	0.496
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.448	-0.165	0.465
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.372	-0.124	0.383

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.

8.1.2 PANASONIC – SIDE OPEN

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 **384** 777	824.70 **836.52** 848.31	**0.513**	**-0.182**	**0.535**
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.469	-0.109	0.481
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.432	-0.114	0.443

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.

8.1.3 SONY VAIO - HORIZONTAL

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013	824.70	0.839	-0.108	0.860
384	**836.52**	**0.858**	**-0.158**	**0.890**
777	848.31	0.807	-0.179	0.841
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013	824.70	0.816	-0.093	0.834
384	836.52	0.831	-0.173	0.865
777	848.31	0.817	-0.195	0.855
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013	824.70	0.809	-0.195	0.846
384	836.52	0.840	-0.155	0.871
777	848.31	0.748	-0.130	0.771

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.

8.1.4 SONY VAIO – VERTICAL

1xEvDO Rel 0 and 1xEVDO Rev A are skipped since SAR values are too low.

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.061	-0.098	0.063

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.

8.1.5 TOSHIBA - HORIZONTAL

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 **384** 777	824.70 **836.52** 848.31	**0.708**	**-0.101**	**0.725**
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.664	-0.159	0.689
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
1013 384 777	824.70 836.52 848.31	0.595	-0.158	0.617

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.

8.1.6 TOSHIBA – VERTICAL

1xEvDO Rel 0 and 1xEVDO Rev A are skipped since SAR values are too low.

1XRTT

Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
1013	824.70			
384	836.52	0.045	0.000	0.045
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.

8.2 PCS BAND

8.2.1 PANASONIC

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.933	-0.116	0.958
600	1880.00	0.858	-0.117	0.881
1175	1908.75	0.644	-0.134	0.664
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.834	-0.140	0.861
600	**1880.00**	**1.240**	**0.000**	**1.240**
1175	1908.75	0.827	-0.129	0.852
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.903	-0.201	0.946
600	1880.00	0.762	0.000	0.762
1175	1908.75	0.731	-0.106	0.749

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.

8.2.2 PANASONIC – SIDE OPEN

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1)] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.511	-0.128	0.526
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1)] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.517	-0.198	0.541
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1)] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.525	0.000	0.525

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.

8.2.3 SONY VAIO - HORIZONTAL

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.701	-0.125	0.721
600	**1880.00**	**1.030**	**-0.157**	**1.068**
1175	1908.75	0.731	-0.102	0.748
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.658	-0.157	0.682
600	1880.00	0.823	-0.156	0.853
1175	1908.75	0.713	-0.171	0.742
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.669	-0.112	0.686
600	1880.00	0.974	-0.199	1.020
1175	1908.75	0.589	-0.138	0.608

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.

8.2.4 SONY VAIO - VERTICAL

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.478	-0.139	0.494
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.467	0.000	0.467
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.481	0.000	0.481

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.

8.2.5 TOSHIBA - HORIZONTAL

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.639	-0.175	0.665
600	1880.00	0.926	-0.157	0.960
1175	1908.75	0.589	-0.200	0.617
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.650	-0.101	0.665
600	1880.00	0.923	-0.173	0.961
1175	1908.75	0.619	-0.107	0.634
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25	1851.25	0.674	-0.177	0.702
600	**1880.00**	**0.947**	**-0.154**	**0.981**
1175	1908.75	0.614	-0.101	0.628

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.

8.2.6 TOSHIBA - VERTICAL

1XRTT				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.220	0.000	0.220
EVDO - Release 0				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.226	0.000	0.226
EVDO - Revision A				
Channel	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1] SAR 1g (mW/g)**
25 600 1175	1851.25 1880.00 1908.75	0.232	0.000	0.232

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.

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

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	TP-1185	QD000P40CA		N/A	
SAM Phantom (SAM2)	SPEAG	TP-1015	N/A		N/A	
Electronic Probe kit	HP	85070C	N/A		N/A	
S-Parameter Network Analyzer	Agilent	8753ES-6	US39173569	2	9	2007
E-Field Probe	SPEAG	EX3DV4	3552	5	30	2007
Data Acquisition Electronics	SPEAG	DAE3 V1	427	11	16	2007
System Validation Dipole	SPEAG	D835V2	4d002	1	23	2008
System Validation Dipole	SPEAG	D1900V2	5d043	1	29	2008
Power Meter	HP	438A	3513U04320	9	4	2007
Amplifier	Mini-Circuits	ZHL-42W	D072701-5		N/A	
Radio Communication Tester	R &S	CMU 200	838114/032	3	21	2007
Radio Communication Tester	Agilent	E5515C	GB46160222	1	29	2007
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		

11 PHOTOS

DUT - AC595U

DUT - AC595U

Panasonic CF-29

Toshiba Satellite P10

12 ATTACHMENTS

No.	Contents	No. Of Pages
1	System Performance Check Plots	8
2-1	SAR Test Plots – Cell Band	21
2-2	SAR Test Plots – PCS Band	37
3	Certificate of E-Field Probe - EXDV4SN3552	9
4	Certificate of System Validation Dipole - D835V2 SN:4d002	9
5	Certificate of System Validation Dipole - D1900V2 SN:5d043	9

END OF REPORT