FCC OET BULLETIN 65 SUPPLEMENT C
IC RSS-102 ISSUE 2

SAR EVALUATION REPORT

FOR

T5010 TABLET COMPUTERS WITH WWAN MC5727 AND INTEL OR ATHEROS WLAN MODULES

MODEL: MC5727

FCC ID: N7N-MC5725-F

REPORT NUMBER: 08U12094-2A

ISSUE DATE: OCTOBER 21, 2008

Prepared for

FUJITSU AUSTRALIA LTD
1230 NEPEAN HIGHWAY
CHELTENHAM, VIC 3192

Prepared by

COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	October 16, 2008	Initial issue	--
A	October 21, 2008	Updated description in Section 7	Sunny Shih

TABLE OF CONTENTS

1 ATTESTATION OF TEST RESULTS

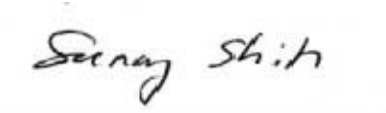
COMPANY NAME:	FUJITSU AUSTRALIA LTD 1230 NEPEAN HIGHWAY CHELTENHAM, VIC 3192
EUT DESCRIPTION:	T5010 TABLET COMPUTERS WITH WWAN MC5727 AND INTEL OR ATHEROS WLAN MODULES The host tablet PC system has following FCC Grants: T5010 tablet PC with Intel WLAN: FCC ID: EJE-WB0058 T5010 tablet PC with Atheros WLAN: FCC ID: EJE-WB0059
FCC ID: **MODEL:**	N7N-MC5725-F MC5727
DEVICE CATEGORY:	Portable
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure
DATE TESTED:	October 3, 6 and 7, 2008
THE HIGHEST SAR VALUES:	See Table below

FCC / IC Rule Parts	Frequency Range [MHz]	The Highest SAR Values (1g_mW/g)	Limit (mW/g)
22H (Cell Band)/ RSS-102	824 - 849	0.344 (Lapheld)	1.6
24E (PCS Band) / RSS-102	1850 - 1909	0.438 (Primary Portrait)	1.6

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC OET BULLETIN 65 SUPPLEMENT C	Pass
RSS-102 ISSUE 2	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.
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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS 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:



SUNNY SHIH
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CAROL BAUMANN
SAR ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2 TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C, Specific FCC Procedure KDB 248227 SAR Measurement Procedure for 820.11abg Transmitters May 2007, KDB 447498_RF Exposure Requirements and Procedures for mobile and portable devices and IC RSS 102 Issue 2: NOVEMBER 2005.

3 FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.
CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4 CALIBRATION AND UNCERTAINTY

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5 MEASUREMENT UNCERTAINTY

Measurement 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

Measurement uncertainty for 3 GHz – 6 GHz

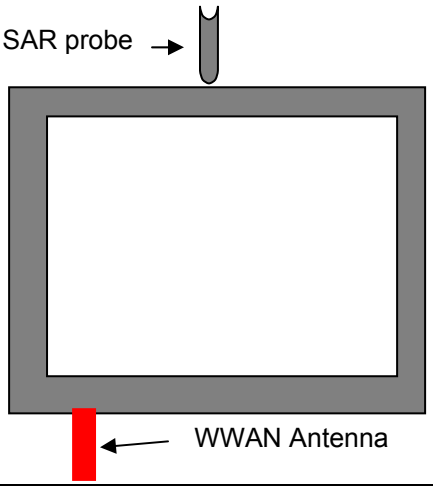
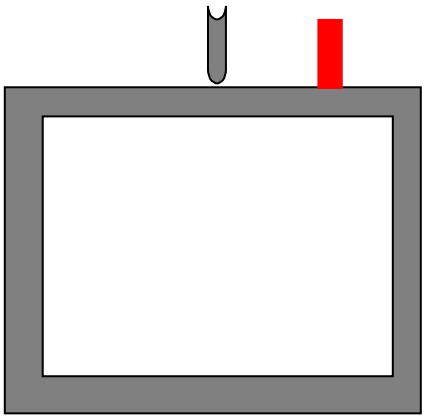
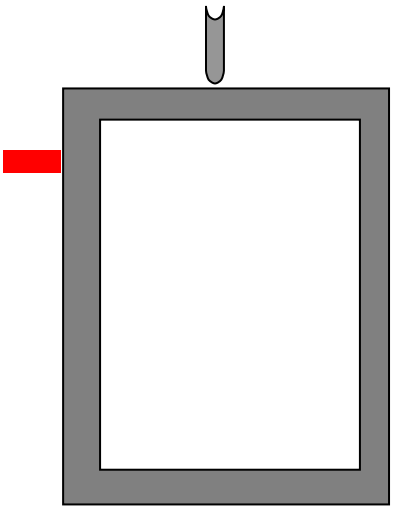
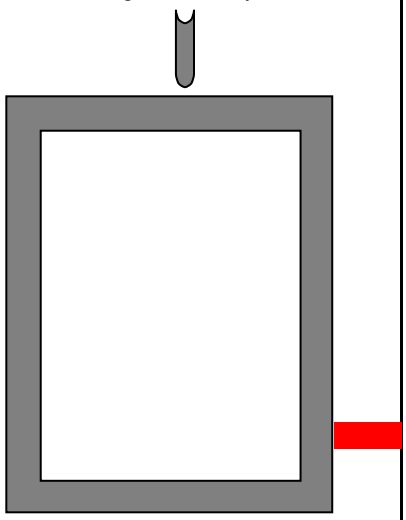
Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)	
						Ui (1g)	Ui(10g)
Measurement System							
Probe Calibration	4.80	N	1	1	1	4.80	4.80
Axial Isotropy	4.70	R	1.732	0.707	0.707	1.92	1.92
Hemispherical Isotropy	9.60	R	1.732	0.707	0.707	3.92	3.92
Boundary Effects	1.00	R	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

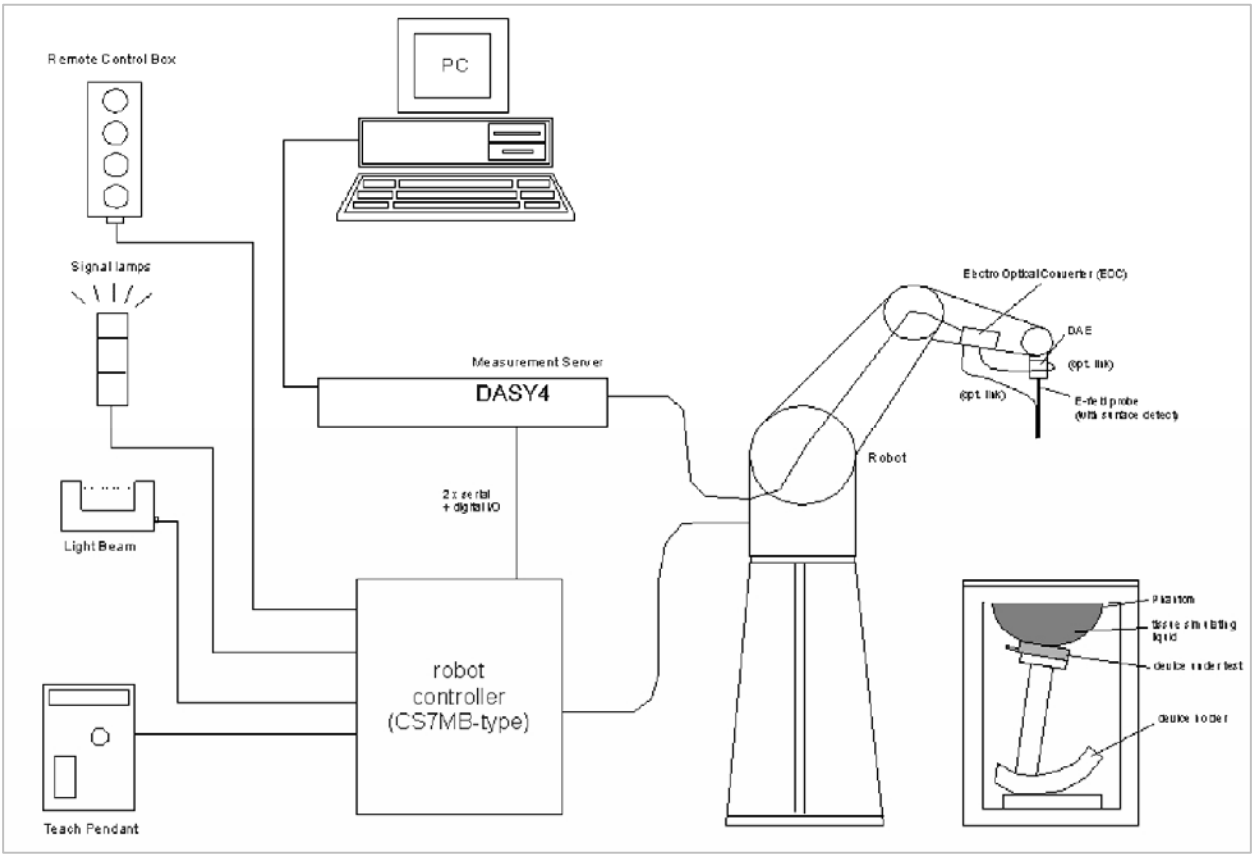
6 TEST EQUIPMENT LIST

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	MY40001647	11	14	2008
E-Field Probe	SPEAG	EX3DV3	3531	4	23	2009
Thermometer	ERTCO	639-1S	1718	5	28	2009
Data Acquisition Electronics	SPEAG	DAE3 V1	500	11	16	2008
System Validation Dipole	SPEAG	D2450V2	748	4	14	2009
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	1	11	2010
Power Sensor	Giga-tronics	80701A	1834588	1	11	2010
Amplifier	Mini-Circuits	ZVE-8G	90606		N/A	
Amplifier	Mini-Circuits	ZHL-42W	D072701-5		N/A	
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		

7 DEVICE UNDER TEST (DUT) DESCRIPTION

<table>
<tr><td colspan="3">T5010 Tablet PC with WWAN MC5727 and Intel or Atheros WLAN modules.
The WWAN MC5727 module with CDMA2000 1xRTT, 1xEv-DO Rel 0 and Rev A
The host tablet PC system has following FCC Grants:
• T5010 tablet PC with Intel WLAN: FCC ID: EJE-WB0058
• T5010 tablet PC with Atheros WLAN: FCC ID: EJE-WB0059</td></tr>
<tr><td>Normal Operation:</td><td colspan="2">• Laptop Mode
• Tablet Mode – in the following configurations.
○ Bottom Face
○ Edge - Primary/Secondary landscape and Primary/Secondary portrait orientations.</td></tr>
<tr><td>Host Device(s):</td><td colspan="2">Fujitsu T5010 Tablet Laptop</td></tr>
<tr><td>Power Supply:</td><td colspan="2">Power supplied through laptop computer (host device)</td></tr>
<tr><td rowspan="2">Tablet Mode – Edge</td><td>Tablet Mode 1: Edge-Primary Landscape
 
</td><td>Tablet Mode 2: Edge-Secondary Landscape
  </td></tr>
<tr><td>Tablet Mode 3: Edge-Primary Portrait
  </td><td>Tablet Mode 4: Edge-Secondary Portrait
  </td></tr>
</table>

8 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.

8.1 COMPOSITION OF INGREDIENTS FOR TISSUE SIMULATING LIQUIDS

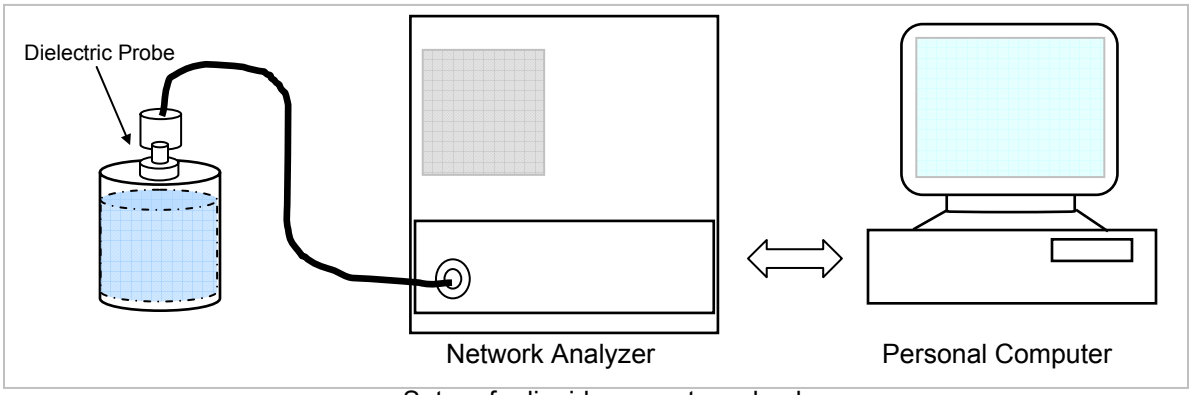
The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

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

9 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)

9.1 SIMULATING LIQUID PARAMETER CHECK RESULT

Simulating Liquid Dielectric Parameters Check Result @ Muscle 1900 MHz

Room Ambient Temperature = 25°C; Relative humidity = 39% Measured by: Carol Baumann

Simulating Liquid		Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Depth (cm)							
1900	15	e'	51.7723	Relative Permittivity (ϵ_r):	51.7723	53.3	-2.87	± 5
		e"	14.3837	Conductivity (σ):	1.52035	1.52	0.02	± 5

Liquid Check
Ambient temperature: 25 deg. C; Liquid temperature: 24 deg. C
October 03, 2008 09:56 AM

Frequency	e'	e"
1710000000.	52.4592	13.7443
1720000000.	52.4068	13.7598
1730000000.	52.3639	13.7714
1740000000.	52.3452	13.7925
1750000000.	52.3405	13.8636
1760000000.	52.2807	13.9437
1770000000.	52.2077	14.0135
1780000000.	52.1414	14.0493
1790000000.	52.1208	14.0727
1800000000.	52.1043	14.1285
1810000000.	52.0990	14.1569
1820000000.	52.0633	14.1431
1830000000.	52.0551	14.1346
1840000000.	52.0376	14.1592
1850000000.	51.9932	14.2001
1860000000.	51.9042	14.2409
1870000000.	51.7983	14.2722
1880000000.	51.7711	14.2852
1890000000.	51.7590	14.3172
1900000000.	**51.7723**	**14.3837**
1910000000.	51.7666	14.4743

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 = 25°C; Relative humidity = 40% Measured by: Carol Baumann

Simulating Liquid		Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Depth (cm)							
1900	15	e'	51.7205	Relative Permittivity (ϵ_r):	51.7205	53.3	-2.96	± 5
		e"	14.4298	Conductivity (σ):	1.52522	1.52	0.34	± 5

Liquid Check
Ambient temperature: 25 deg. C; Liquid temperature: 24 deg. C
October 06, 2008 08:30 AM

Frequency	e'	e"
1710000000.	52.4198	13.8084
1720000000.	52.3843	13.7995
1730000000.	52.3430	13.7992
1740000000.	52.3140	13.8252
1750000000.	52.2843	13.9096
1760000000.	52.2099	13.9803
1770000000.	52.1407	14.0544
1780000000.	52.1024	14.0889
1790000000.	52.1000	14.1295
1800000000.	52.0946	14.1726
1810000000.	52.0739	14.1782
1820000000.	52.0286	14.1655
1830000000.	52.0073	14.1541
1840000000.	51.9936	14.1828
1850000000.	51.9360	14.2497
1860000000.	51.8482	14.3039
1870000000.	51.7596	14.3381
1880000000.	51.7186	14.3349
1890000000.	51.7038	14.3838
1900000000.	**51.7205**	**14.4298**
1910000000.	51.6769	14.4618

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 = 25°C; Relative humidity = 40% Measured by: Carol Baumann

Simulating Liquid		Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Depth (cm)							
835	15	e'	53.5299	Relative Permittivity (ϵ_r):	53.5299	55.2	-3.03	± 5
		e"	21.0320	Conductivity (σ):	0.97698	0.97	0.72	± 5

Liquid Check
Ambient temperature: 25 deg. C; Liquid temperature: 24 deg. C
October 07, 2008 08:30 AM

Frequency	e'	e"
750000000.	54.3939	21.5112
755000000.	54.3109	21.5254
760000000.	54.2686	21.4787
765000000.	54.2238	21.4569
770000000.	54.1942	21.4419
775000000.	54.1443	21.3988
780000000.	54.1061	21.3869
785000000.	54.0825	21.3471
790000000.	54.0328	21.3624
795000000.	53.9532	21.3538
800000000.	53.8954	21.3379
805000000.	53.8250	21.3152
810000000.	53.7604	21.2572
815000000.	53.6915	21.1846
820000000.	53.6390	21.1237
825000000.	53.5817	21.1096
830000000.	53.5288	21.0887
835000000.	**53.5299**	**21.0320**
840000000.	53.4409	20.9974
845000000.	53.3708	21.0110
850000000.	53.3306	21.0137
855000000.	53.2609	20.9624
860000000.	53.2252	20.9423
865000000.	53.1773	20.9161
870000000.	53.1468	20.9050
875000000.	53.1335	20.9088
880000000.	53.1208	20.9122
885000000.	53.0719	20.9291
890000000.	53.0516	20.9351
895000000.	52.9998	20.9113
900000000.	52.9307	20.8944

The conductivity (σ) can be given as:

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

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

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

10 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 7x7x7 (2.4 GHz) fine cube was chosen for cube integration and Special 8x8x10 (5 GHz) fine cube was chosen for cube integration
- Distance between probe sensors and phantom surface was set to 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5mm
- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

450 to 2450 MHz 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 GHz 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 finite-difference time-domain FDTD method (feed point-impedance set to 50 ohms) and the mechanical dimensions of the D5GHzV2 dipole (manufactured by SPEAG).

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.

10.1 SYSTEM PERFORMANCE CHECK RESULTS

System Validation Dipole: D1900V2 SN:5d043

The dipole input power (forward power): 250 mW

Results

Date: October 3, 2008

Ambient Temperature = 25°C; Relative humidity = 39% Measured by: Carol Baumann

Body Simulating Liquid			Normalized to 1 W		Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)					
1900	24	15	1g	37.1	39.8	-6.78	± 10
			10g	19.5	20.8	-6.25	± 10

Date: October 6, 2008

Ambient Temperature = 25°C; Relative humidity = 40% Measured by: Carol Baumann

Body Simulating Liquid			Normalized to 1 W		Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)					
1900	24	15	1g	36.5	39.8	-8.29	± 10
			10g	19.2	20.8	-7.69	± 10

System Validation Dipole: D835V2 SN: 4d002

The dipole input power (forward power): 250 mW

Results

Date: October 7, 2008

Ambient Temperature = 25°C; Relative humidity = 40% Measured by: Carol Baumann

Body Simulating Liquid			Normalized to 1 W		Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)					
835	24	15	1g	9.34	9.7	-3.81	± 10
			10g	6.17	6.4	-3.29	± 10

11 OUTPUT POWER VERIFICATION

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

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

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				
				Conducted power (dBm)
Channel	f (MHz)	FETAP-Traffic Format	RETAP-Data Payload Size	Average
1013	824.70	307.2 kbps QPSK/ACK channel is transmitted at all slots	4096	24.85
384	836.52			24.95
777	848.31			24.79

PCS Band				
				Conducted power (dBm)
Channel	f (MHz)	FETAP-Traffic Format	RETAP-Data Payload Size	Average
25	1851.25	307.2 kbps QPSK/ACK channel is transmitted at all slots	4096	24.95
600	1880.00			24.92
1175	1908.75			24.90

SAR Evaluation Consideration

The mode of operation was selected based upon output power verification.

- Per FCC 3G procedures for 1xRTT with EV-DO Data modem device, when 1xRTT highest output power is less 0.25 dB higher of highest output power of EV-DO, 1xRTT SAR measurement is not required.
    - Based upon output power measurement, the highest measured 1xRTT output power is 24.95 dBm (cell band) / 24.90 dBm (PCS band) which is not 0.25 dB higher of EV-DO Rel.0 / 24.92 dBm (cell band) / 24.84 dBm (PCS band)
- Per the FCC 3G procedures for EV-DO Rev 0/A Data modem device, EV-DO Rev.A SAR evaluation is not required when the highest measured average output power is less than EV-DO Rel. 0.

Mode	Band	Highest output power (dBm)	Mode selected for testing
EV-DO Rel. 0	Cell	24.92	☒
	PCS	24.84	
EV-DO Rev. A	Cell	24.95	☒
	PCS	24.95	

Final SAR evaluations were performed for both EV-DO Rel.0 and Rev. A.

12 KDB 447498 RF EXPOSURE ASSESSMENT

KDB 447498, b) iii): For each edge positioned closest to the user, simultaneous transmission SAR evaluation is not required when the simultaneous transmitting antennas along that edge are:
(1) Located < 5 cm from the edge and the sum of the stand-alone 1-g SAR is < the SAR limit for these antennas or the SAR-to-peak location separation ratios are < 0.3 for all antenna pairs.

ASSESSMENT:
Tablet Mode 2: Edge - Secondary Landscape
SAR testing is not required since the WWAN antenna is not a functional orientation.

When the Host is at Tablet Mode (Bottom Face) - Lap-held position, the WLAN main antenna (Ant 1), WWAN main (Ant 5) and BT (Ant 4) is less than 5 cm from the edge.

Since BT output power is below power threshold (60/f(GHz) mW, BT stand alone SAR is not required.

The stand alone SAR values and sum of the highest SAR value:

Test Configuraion: Tablet Mode (Bottom Face) - Lap-held position			
Radio	Antenna	Freq. Band	Stand Alone SAR Value (mW/g)
Sierra Wireless - WWAN	Main (Ant 5)	850 MHz	**0.344**
Sierra Wireless - WWAN	Main (Ant 5)	1900 MHz	0.213
Intel - WLAN	Main Ant 1	2.4 GHz	**0.041**
Intel - WLAN	Main Ant 1	5 GHz	0.028
Atheros - WLAN	Main Ant 1	2.4 GHz	0.026
Atheros - WLAN	Main Ant 1	5 GHz	0.012
Sum of the highest 1g SAR of the individual radio:			**0.385**

- The sum of the stand-alone 1-g SAR is < the SAR limit
- The WLAN main antenna (Ant 1) to WWAN main antenna (Ant 5) separation distance is 10.7 cm, thus the SAR-to-peak location ratio (0.036) is less than 0.3.
    - SAR-to-peak location ratio: 0.385/10.7 = 0.036

As the result, simultaneous SAR evaluation for WWAN-Main (Ant 5) and WLAN-Main (Ant 1) is not required.

13 SAR TEST RESULTS

13.1 SAR TEST RESULT FOR CELL BAND

1) **Laptop Mode: Lap-held with the display open at 90° to the keyboard.**
SAR testing is not required due to the large distance (> 20 cm) between WWAN antenna and person's body.

2) **Tablet Mode 1: Edge - Primary Landscape**
SAR testing is not required due to the large distance (> 20 cm) between WWAN antenna and person's body.

3) **Tablet Mode 2: Edge - Secondary Landscape**
SAR testing is not required since the WWAN antenna is not a functional orientation.

4) **Tablet Mode 3: Edge - Primary Portrait**

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rel. 0	0	384	836.52	0.021	1.6
EV-DO Rel. 0	90	384	836.52	0.285	1.6

Antenna configuration below was chosen based on measured SAR values for EV-DO Rel. 0.

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rev. A	90	384	836.52	0.246	1.6

5) **Tablet Mode 4: Edge - Secondary Portrait**

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rel. 0	90	384	836.52	0.073	1.6
EV-DO Rev. A	90	384	836.52	0.062	1.6

6) **Tablet Mode 5: Bottom Face - Lap-held**

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rel. 0	**90**	**384**	**836.52**	**0.344**	**1.6**
EV-DO Rev. A	90	384	836.52	0.287	1.6

Notes:

a. 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.

The Highest SAR Plot & Data for Cell Band

Date/Time: 10/7/2008 3:23:03 PM

Test Laboratory: Compliance Certification Services

Tablet Mode 5 Bottom Face - Lapheld

DUT: Fujitsu; Type: N/A; Serial: N/A

Communication System: CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.978 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

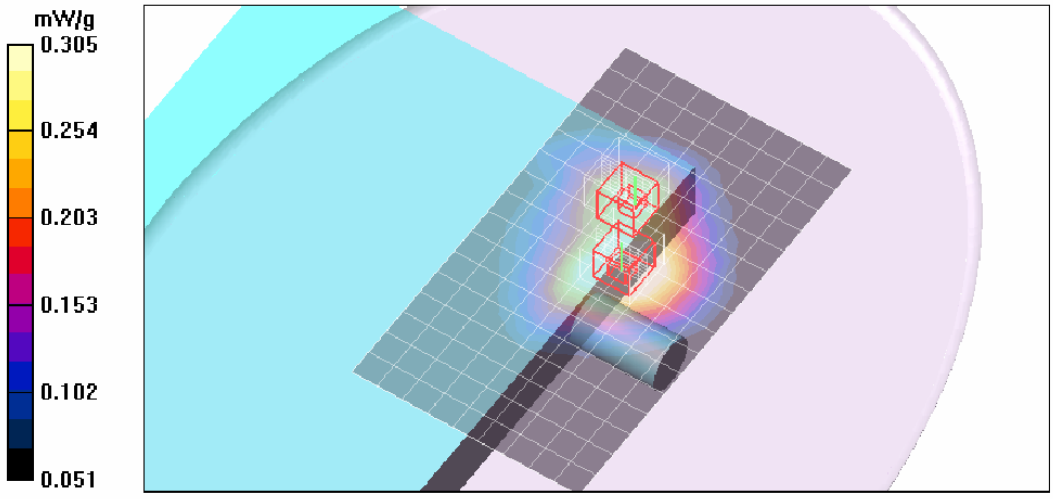
Room Ambient Temperature: 25.0 deg. C; Liquid Temperature: 24.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(10.22, 10.22, 10.22); Calibrated: 4/23/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 11/16/2007
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:XXXX
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

EV-DO Rel. 0_M-Ch Ant 90/Area Scan (10x17x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.360 mW/g

EV-DO Rel. 0_M-Ch Ant 90/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.66 V/m; Power Drift = -0.166 dB
Peak SAR (extrapolated) = 0.469 W/kg
SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.245 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.389 mW/g

EV-DO Rel. 0_M-Ch Ant 90/Zoom Scan (7x7x9)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.66 V/m; Power Drift = -0.166 dB
Peak SAR (extrapolated) = 0.362 W/kg
SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.204 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.305 mW/g



13.2 SAR TEST RESULT FOR PCS BAND

1) Laptop Mode: Lap-held with the display open at 90° to the keyboard

SAR testing is not required due to the large distance (> 20 cm) between WWAN antenna and person's body.

2) Tablet Mode 1: Edge - Primary Landscape

SAR testing is not required due to the large distance (> 20 cm) between WWAN antenna and person's body.

3) Tablet Mode 2: Edge - Secondary Landscape

SAR testing is not required since the WWAN antenna is disabled by software tool for this configuration.

4) Tablet Mode 3: Edge - Primary Portrait

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rel. 0	0	600	1880.00	0.045	1.6
EV-DO Rel. 0	**90**	**600**	**1880.00**	**0.438**	**1.6**

Antenna configuration below was chosen based on measured SAR values for EV-DO Rel. 0.

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rev. A	90	600	1880.00	0.383	1.6

5) Tablet Mode 4: Edge - Secondary Portrait

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rel. 0	0	600	1880.00	0.018	1.6
EV-DO Rel. 0	90	600	1880.00	0.181	1.6

Antenna configuration below was chosen based on measured SAR values for EV-DO Rel. 0.

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rev. A	90	600	1880.00	0.157	1.6

6) Tablet Mode 5: Bottom Face - Lap-held

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rel. 0	0	600	1880.00	0.021	1.6
EV-DO Rel. 0	90	600	1880.00	0.213	1.6

Antenna configuration below was chosen based on measured SAR values for EV-DO Rel. 0.

Mode	Antenna (Deg)	Channel	f (MHz)	Measured SAR 1g (mW/g)	Limit
EV-DO Rev. A	90	600	1880.00	0.187	1.6

Notes:

a. 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.

The Highest SAR Plot & Data for PCS Band

Date/Time: 10/6/2008 10:44:15 AM

Test Laboratory: Compliance Certification Services

Tablet Mode 3 Edge - Primary Portrait

DUT: Fujitsu; Type: N/A; Serial: N/A

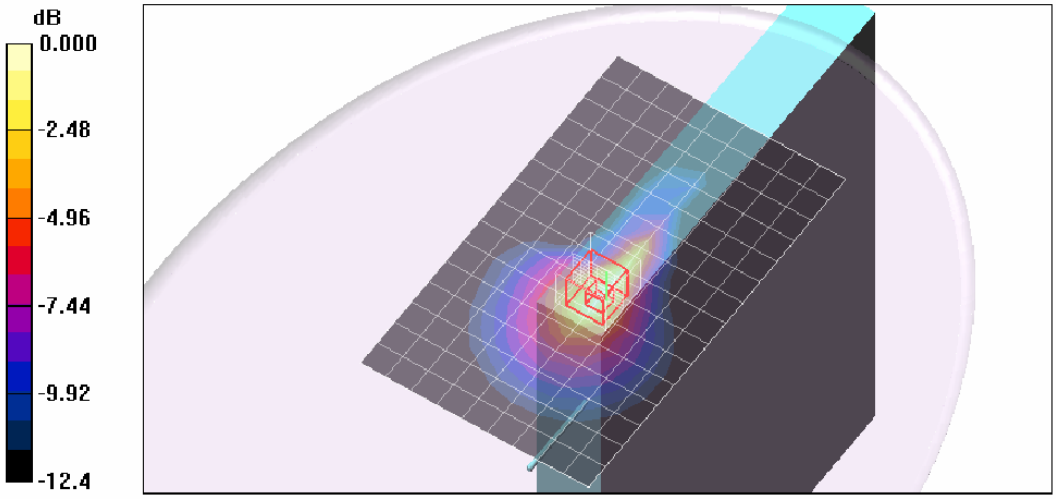
Communication System: CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 25.0 deg. C; Liquid Temperature: 24.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(8.7, 8.7, 8.7); Calibrated: 4/23/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 11/16/2007
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:XXXX
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

EV-DO Rel. 0_M-Ch Ant 90/Area Scan (10x16x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.525 mW/g

EV-DO Rel. 0_M-Ch Ant 90/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.56 V/m; Power Drift = 0.260 dB
Peak SAR (extrapolated) = 0.950 W/kg
SAR(1 g) = 0.438 mW/g; SAR(10 g) = 0.232 mW/g
Maximum value of SAR (measured) = 0.554 mW/g



0 dB = 0.554mW/g

14 ATTACHMENTS

No.	Contents	No. Of Pages
1	System Performance Check Plots	6
2-1	SAR Test Plots for Cell Band	8
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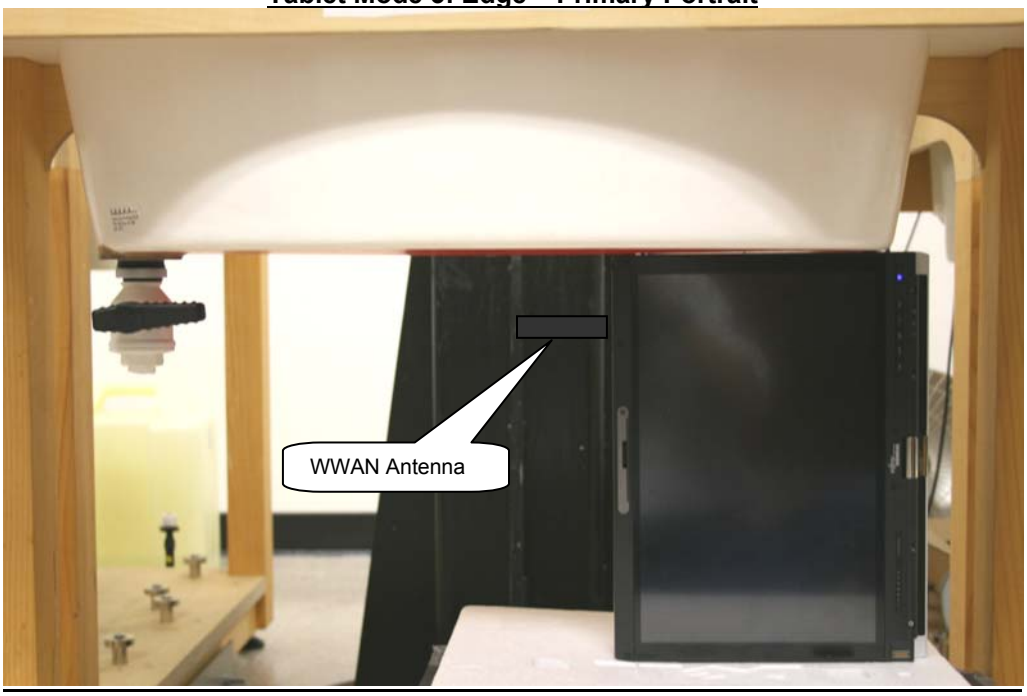
3	Certificate of E-Field Probe - EX3DV3SN3531	10
4	Certificate of System Validation Dipole - D835V2 SN:4d002	9
5	Certificate of System Validation Dipole - D1900V2 SN:5d043	9

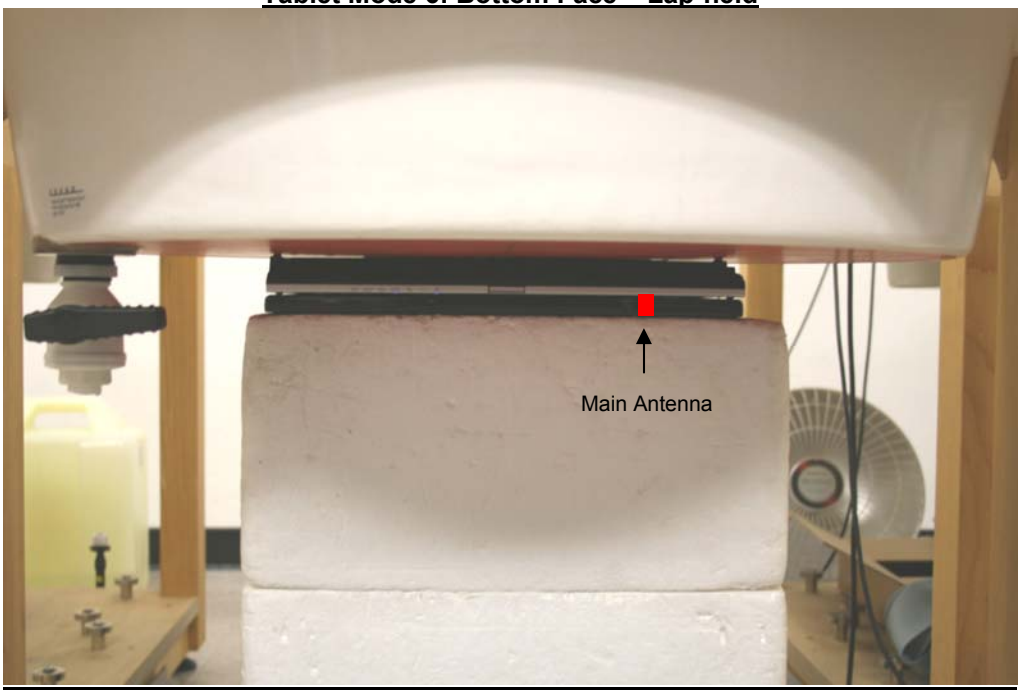
15 SETUP PHOTOS

Tablet Mode 3: Edge – Primary Portrait



Tablet Mode 4: Edge – Secondary Portrait
(shown with antenna in 90° position)

Tablet Mode 6: Bottom Face – Lap-held



END OF REPORT