



**FCC OET BULLETIN 65 SUPPLEMENT C  
CLASS II PERMISSIVE CHANGE  
IC RSS-102 ISSUE 3**

**SAR EVALUATION REPORT**

*For*

**PCI EXPRESS MINI CARD**

**(Tested inside of Dell Notebook PC, Inspiron Model 1011)**

**MODEL NUMBER: E760**

**FCC ID: PKRNVWE760D**

**IC ID: 3229A-E760**

**REPORT NUMBER: 09U12621-3**

**ISSUE DATE: July 24, 2009**

*Prepared for*

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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
--	July 24, 2009	Initial Issue	--

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Novatel Wireless Inc  
 9645 Scranton Road Suite 205  
 San Diego, CA 92121-3030  
 United States

**EUT DESCRIPTION:** PCI EXPRESS MINI CARD  
 (Tested inside of Dell Notebook PC, Inspiron Model 1011)

**MODEL NUMBER:** E760

**DEVICE CATEGORY:** Portable

**EXPOSURE CATEGORY:** General Population/Uncontrolled Exposure

**DATE TESTED:** July 9, 2009

**THE HIGHEST SAR VALUES:**

FCC / IC Rule Parts	Frequency Range [MHz]	The Highest SAR Values (1g_mW/g)	Limit (mW/g)
22H / RSS-132	824 - 849	0.064	1.6
24E / RSS-133	1850 - 1910	0.037	

**APPLICABLE STANDARDS AND TEST PROCEDURES:**

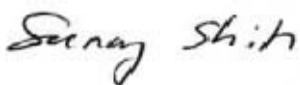
STANDARDS AND TEST PROCEDURES	TEST RESULTS
<ul style="list-style-type: none"> <li>• FCC OET Bulletin 65 Supplement C and the following specific Test Procedures:                             <ul style="list-style-type: none"> <li>○ KDB 941225 D01 SAR test for 3G devices</li> </ul> </li> </ul>	Pass
<ul style="list-style-type: none"> <li>• RSS-102 ISSUE 3</li> </ul>	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. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:

Tested By:




SUNNY SHIH  
 ENGINEERING SUPERVISOR  
 COMPLIANCE CERTIFICATION SERVICES

CHAO YEN LIN  
 EMC ENGINEER  
 COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C, IC RSS 102 Issue 3 and the following specific FCC Test Procedures.

- KDB 941225 D01 SAR test for 3G devices

## 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.

Name of Equipment	Manufacturer	Type/Model	Serial No.	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	2009
Signal Generator	Agilent	8753ES-6	MY40001647	11	14	2009
E-Field Probe	SPEAG	EX3DV4	3686	3	23	1010
Thermometer	ERTCO	639-1S	1718	5	1	2010
Data Acquisition Electronics	SPEAG	DAE3 V1	427	10	20	2009
System Validation Dipole	SPEAG	D835V2	4d002	4	23	2011
System Validation Dipole	SPEAG	D900V2	108	1	21	2010
System Validation Dipole	SPEAG	D1800V2	294	1	29	2010
System Validation Dipole	SPEAG	D1900V2	5d043	1	29	2010
System Validation Dipole	SPEAG	D2450V2	748	4	14	2010
System Validation Dipole	SPEAG	D5GHzV2	1003	11	21	2009
MXA Signal Analyzer	Agilent	N9020A	US48350984	10	23	2009
ESG Vector Signal Generator	Agilent	E4438C	US44271090	9	17	2010
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	H1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1800	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1800	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1700	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1700	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M900	N/A	Within 24 hrs of first test		
Simulating Liquid	SPAEG	H2450	N/A	Within 24 hrs of first test		
Simulating Liquid	SPAEG	M2450	N/A	Within 24 hrs of first test		

## 4.2. 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)	
<b>Measurement System</b>								
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 Mechanical 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	
<b>Test sample Related</b>								
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	
<b>Phantom and Tissue Parameters</b>								
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	
<b>Combined Standard Uncertainty</b>						RSS	11.44	10.49
<b>Expanded Uncertainty (95% Confidence Interval)</b>						K=2	22.87	20.98
Notes for table								
1. Tol. - tolerance in influence quantity								
2. N - Normal								
3. R - Rectangular								
4. Div. - Divisor used to obtain standard uncertainty								
5. Ci - is the sensitivity coefficient								

## 5. EQUIPMENT UNDER TEST

PCI EXPRESS MINI CARD (Tested inside of Dell Notebook PC, Model PP19S)

The E760 module has the features of CDMA2000 1xRTT, 1xEV-DO (Release 0 & Revision A) and 1xEV-DO (Release 0) at cellular (850 MHz) and PCS (1900 MHz) band

Normal operation:

Lap-held only

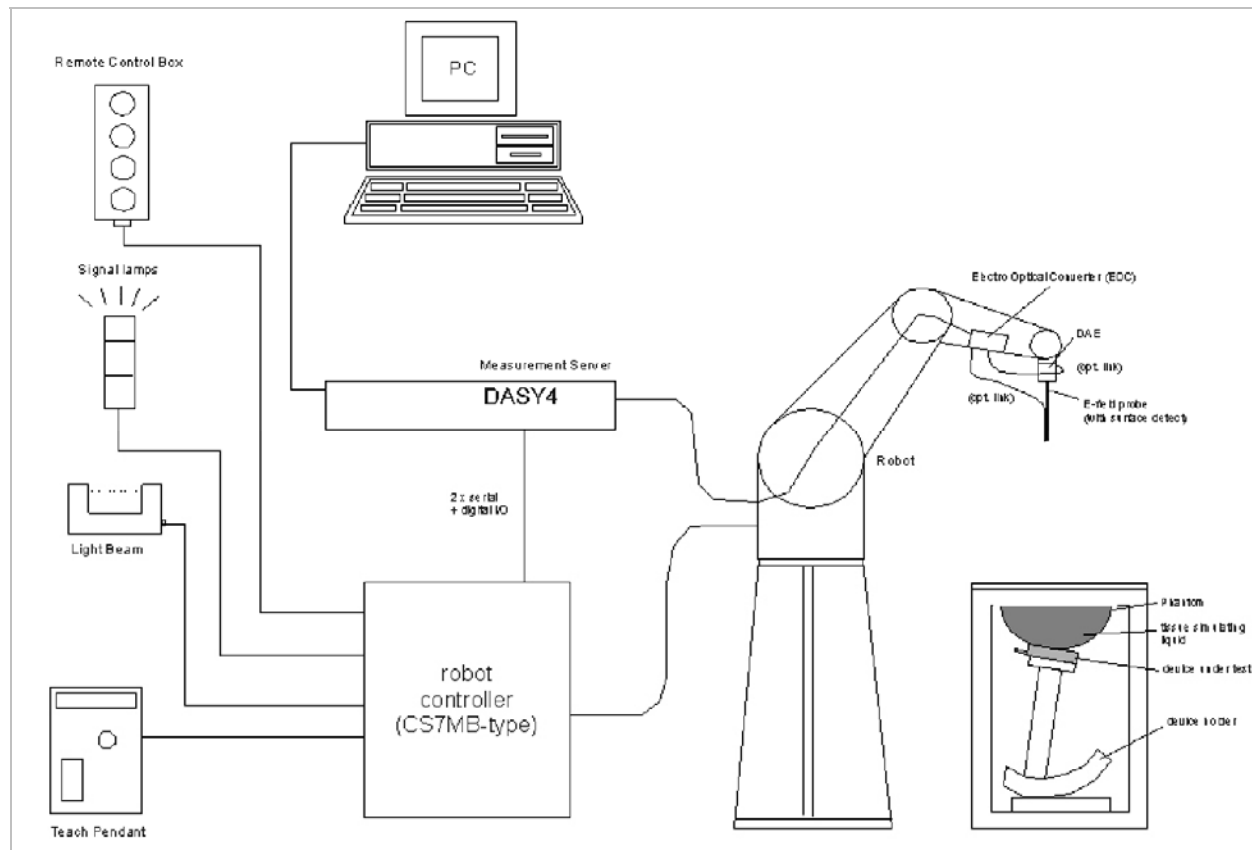
Note: SAR test with display open at 90° to the keyboard

Antenna(s):

Internal. Located at top of the display



## 6. SYSTEM SPECIFICATIONS



### 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.

## 7. 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

## 8. LIQUID PARAMETERS CHECK

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

### 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	
	$\epsilon_r$	$\sigma$ (S/m)	$\epsilon_r$	$\sigma$ (S/m)
150	52.3	0.76	61.9	0.8
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.9	55.2	0.97
900	41.5	0.97	55	1.05
915	41.5	0.98	55	1.06
1450	40.5	1.2	54	1.3
1610	40.3	1.29	53.8	1.4
1800 – 2000	40	1.4	53.3	1.52
2450	39.2	1.8	52.7	1.95
3000	38.5	2.4	52	2.73
5800	35.3	5.27	48.2	6

( $\epsilon_r$  = relative permittivity,  $\sigma$  = conductivity and  $\rho = 1000 \text{ kg/m}^3$ )

### 8.1. LIQUID CHECK RESULTS FOR 1900 MHZ

Simulating Liquid Dielectric Parameters for Muscle 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Chaoyen Lin

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	53.008	Relative Permittivity ( $\epsilon_r$ ):	53.0083	53.3	-0.55	± 5
	e"	13.935	Conductivity ( $\sigma$ ):	1.47295	1.52	-3.10	± 5

Liquid temperature: 23 deg. C

July 09, 2009 10:00 AM

Frequency	e'	e"
1710000000.	53.6330	13.4155
1720000000.	53.6061	13.5060
1730000000.	53.6197	13.6066
1740000000.	53.6219	13.6466
1750000000.	53.6350	13.6881
1760000000.	53.5822	13.6755
1770000000.	53.5209	13.6596
1780000000.	53.4395	13.6143
1790000000.	53.3400	13.6220
1800000000.	53.2867	13.6305
1810000000.	53.2216	13.6899
1820000000.	53.1731	13.7860
1830000000.	53.1221	13.8847
1840000000.	53.0959	13.9835
1850000000.	53.0912	13.9977
1860000000.	53.1049	14.0100
1870000000.	53.0958	13.9992
1880000000.	53.0850	13.9572
1890000000.	53.0435	13.9436
<b>1900000000.</b>	<b>53.0083</b>	<b>13.9353</b>
1910000000.	52.9234	14.0317

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

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

$$\epsilon_0 = 8.854 * 10^{-12}$$

## 8.2. LIQUID CHECK RESULTS FOR 835 MHZ

Simulating Liquid Dielectric Parameters for Muscle 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 40%

Measured by: Chaoyen Lin

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	53.40	Relative Permittivity ( $\epsilon_r$ ):	53.402	55.2	-3.26	± 5
	e"	21.01	Conductivity ( $\sigma$ ):	0.976	0.97	0.63	± 5
900	e'	52.85	Relative Permittivity ( $\epsilon_r$ ):	52.845	55.0	-3.92	± 5
	e"	20.65	Conductivity ( $\sigma$ ):	1.034	1.05	-1.55	± 5

Liquid temperature: 23 deg. C

July 09, 2009 03:44 PM

Frequency	e'	e"
805000000.	53.7372	21.0971
810000000.	53.6850	21.0754
815000000.	53.6360	21.0753
820000000.	53.5644	21.0555
825000000.	53.5293	21.0562
830000000.	53.4587	21.0476
<b>835000000.</b>	<b>53.4018</b>	<b>21.0123</b>
840000000.	53.3168	20.9877
845000000.	53.2884	20.9647
850000000.	53.2597	20.9094
855000000.	53.1807	20.8623
860000000.	53.1322	20.8368
865000000.	53.1035	20.8043
870000000.	53.0217	20.7705
875000000.	52.9912	20.7286
880000000.	52.9278	20.7101
885000000.	52.9128	20.7050
890000000.	52.8789	20.6757
895000000.	52.8855	20.6415
<b>900000000.</b>	<b>52.8452</b>	<b>20.6461</b>
905000000.	52.7925	20.6297
910000000.	52.7289	20.6488
915000000.	52.6266	20.6316
920000000.	52.5311	20.6021
925000000.	52.4510	20.5825
930000000.	52.3729	20.5524
935000000.	52.3151	20.4944
940000000.	52.2808	20.4681
945000000.	52.2782	20.4192
950000000.	52.2502	20.3807
955000000.	52.2161	20.3749
960000000.	52.2033	20.3704

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

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

$$\epsilon_0 = 8.854 * 10^{-12}$$

## 9. SYSTEM 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  $\pm 10\%$ .

### System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV3 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 fine cube was chosen for cube
- 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 2.5 mm
- The dipole input power (forward power) was  $250 \text{ mW} \pm 3\%$ .
- The results are normalized to 1 W input power.

450 to 2450 MHz Reference SAR Values for Body-tissue (From SPEAG)

Dipole Type	Distance	Frequency	SAR (1g)	SAR (10g)	SAR (peak)
	(mm)	(MHz)	[W/kg]	[W/kg]	[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.

### 9.1. SYSTEM CHECK RESULTS FOR D1900V2

System Validation Dipole: D1900V2 SN: 5d043

Date: July 9, 2009

Ambient Temperature = 24°C; Relative humidity = 35%

Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	1900	250	1g SAR:	39.2	39.8	-1.51	±10
			10g SAR:	20.6	20.8	-0.96	

### 9.2. SYSTEM CHECK RESULTS FOR D835V2

System Validation Dipole: D835V2 SN:4d002

Date: July 9, 2009

Ambient Temperature = 25°C; Relative humidity = 40%

Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	835	250	1g SAR:	10.2	9.71	5.05	±10
			10g SAR:	6.67	6.38	4.55	





### 10.3. RF Output Power for EVDO Release 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.09.13

#### EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parm:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

#### EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parm:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

#### RF Power Output for EV-DO Rel 0

Cell Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)
				Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	23.55
		384	836.52	23.74
		777	848.31	23.42

PCS Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)
				Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	23.22
		600	1880.00	23.35
		1175	1908.75	23.35

### 10.4. RF Output Power for EVDO Release A

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

<u>Application</u>	<u>Rev, License</u>
1xEV-DO Terminal Test	A.09.13

**EVDO Release A – RETAP**

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- 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)

**EVDO Release A - FETAP**

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- 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)

**RF Power Output Results for EV-DO Rev A**

**Cell Band**

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)
				Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	23.77
		384	836.52	24.01
		777	848.31	23.56

**PCS Band**

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)
				Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	23.74
		600	1880.00	24.05
		1175	1908.75	23.88

## 11. KDB 941225 TEST REDUCTION CONSIDERATION

### Body SAR Measurement

Based upon the power measurement in section 10.3 and 10.4, SAR for 1xEVDO Rev.0 and Rev. A power measurement is not  $\frac{1}{4}$  dB higher than RC3.

Thus, RC3/SO32 is used for body SAR measurement

## 12. SUMMARY OF TEST RESULTS

If the SAR measured at the middle channel for each test configuration is at least 3.0 dB (0.8 mW/g) lower than the SAR limit (1.6 mW/g), testing at the high and low channels is optional for such test configuration(s).

### 12.1. CDMA2000 1XRTT (Cell Band)

Test position	Radio Configuration	Service Option	Channel	f (MHz)	1g SAR	Limit (mW/g)
					(mW/g)	
Lap-held	3	32	1013	824.70		1.6
			384	836.52	0.064	
			777	848.31		

### 12.2. CDMA2000 1XRTT (PCS Band)

Test position	Radio Configuration	Service Option	Channel	f (MHz)	1g SAR	Limit (mW/g)
					(mW/g)	
Lap-held	3	32	25	1851.25		1.6
			600	1880.00	0.037	
			1175	1908.75		

### 13. WORST-CASE SAR TEST PLOTS

#### WORST-CASE SAR PLOT for Part 22 (Cell Band)

Date/Time: 7/9/2009 4:55:39 PM

Test Laboratory: Compliance Certification Services

#### Body Worn Cell Band

DUT: Dell; Type: PP19S; Serial: Not Specified

Communication System: CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 836.52$  MHz;  $\sigma = 0.977$  mho/m;  $\epsilon_r = 53.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 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: EX3DV4 - SN3686; ConvF(8.7, 8.7, 8.7); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

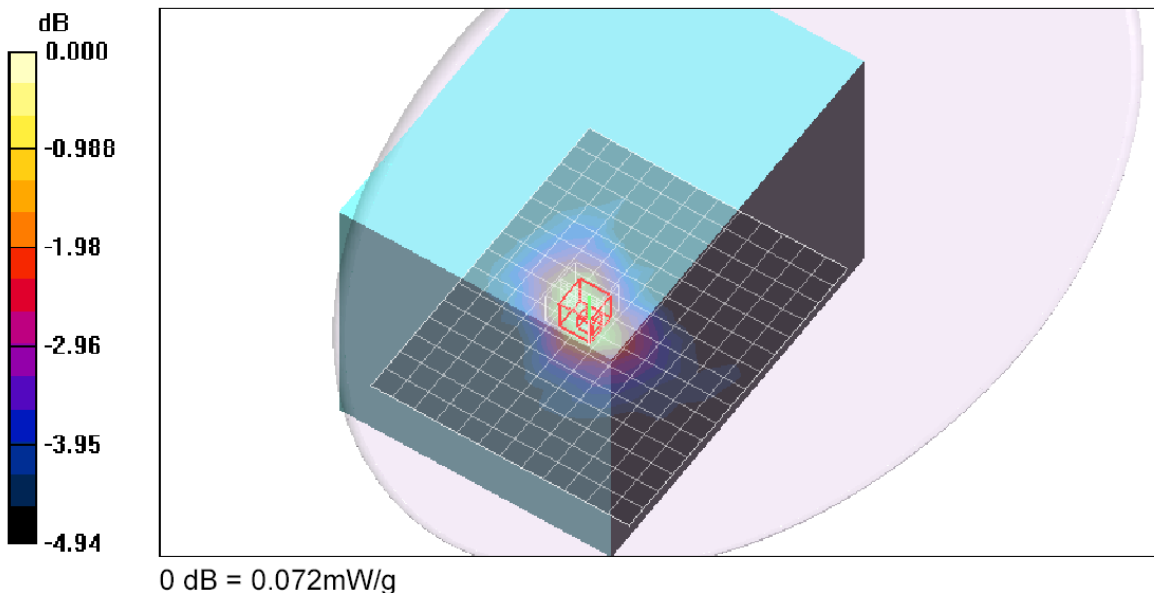
#### Lapheld, Cell Band M-ch/Area Scan (13x16x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.067 mW/g

#### Lapheld, Cell Band M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 4.37 V/m; Power Drift = -0.819 dB  
Peak SAR (extrapolated) = 0.089 W/kg  
**SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.048 mW/g**

Maximum value of SAR (measured) = 0.072 mW/g



WORST-CASE SAR PLOT for Part 24 (PCS Band)

Date/Time: 7/9/2009 2:44:32 PM

Test Laboratory: Compliance Certification Services

**Body Worn PCS Band**

DUT: Dell; Type: PP19S; Serial: Not Specified

Communication System: CDMA PCS band; Frequency: 1880 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 53.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

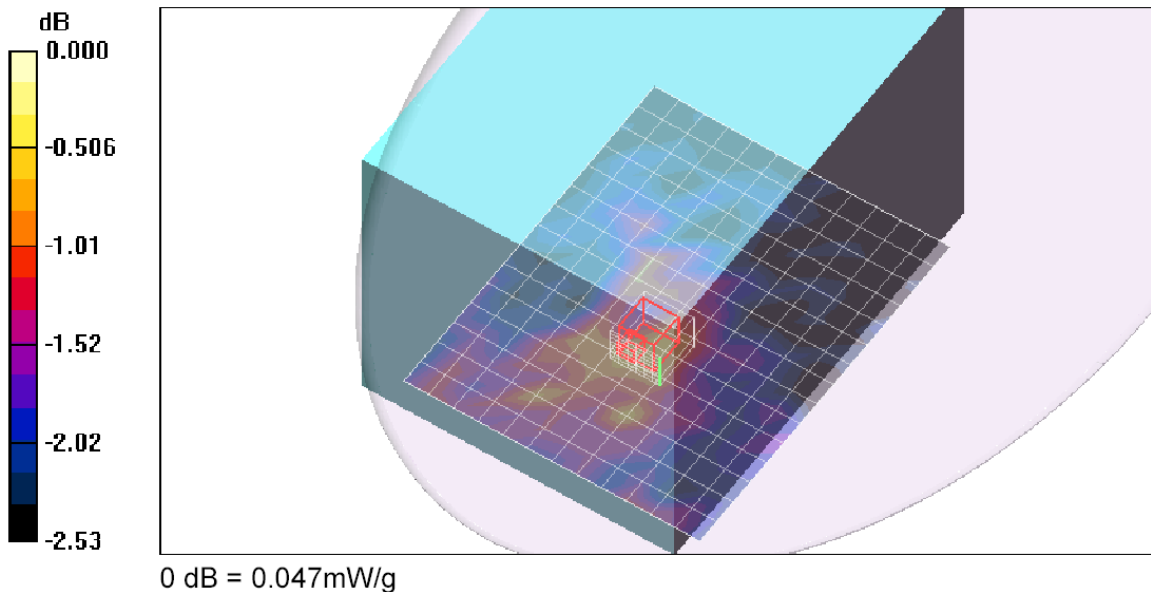
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(6.85, 6.85, 6.85); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: Flat Phantom ELL4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Lapheld, PCS Band M-ch/Area Scan (13x16x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 0.040 mW/g

**Lapheld, PCS Band M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 3.81 V/m; Power Drift = 0.658 dB  
Peak SAR (extrapolated) = 0.047 W/kg  
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.034 mW/g

Maximum value of SAR (measured) = 0.047 mW/g



## 14. ATTACHMENTS

No.	Contents	No. of page (s)
1	System Performance Check Plots	4
2	Certificate of E-Field Probe – EX3DV4 SN3686	10
3	Certificate of System Validation Dipole - D835V2 SN:4d002	9
4	Certificate of System Validation Dipole - D1900V2 SN:5d043	9

## 15. TEST SETUP PHOTO

SETUP PHOTO FOR WWAN





## 16. HOST DEVICE PHOTO

HOST DEVICE PHOTO (PP19S)



HOST DEVICE PHOTO W/ ANTENNA LOCATIONS



**END OF REPORT**