SPECIFIC ABSORPTION RATE (SAR) TEST REPORT

Novatel Wireless
9645 Scranton Rd, Suite 205
San Diego, CA, 92121

Product: USB connected 1xEVDO Data Modem
Model Number: MCD3000 / U720 / USB720
Product FCCID:PKRNVWMCD3000

Tested to the SAR Criteria in
FCC OET Bulletin 65, Supplement C (Edition 01-01)

Date: 9/22/2006
Project Number: 3103199
Report Number: 3103199LEX-001

Prepared By:  **Date:** 9/22/2006

Vinay Kutty, Senior Project Engineer

Approved By:  **Date:** 9/22/2006

Bryan C. Taylor, Team Leader – Engineering

Intertek Testing Services NA, Inc.
731 Enterprise Drive, Lexington, KY 40510
Telephone: 859-226-1000 Fax: 859-226-1040 Web: www.etlsemko.com

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1.0 Document History

Revision/ Project Number	Writer Initials	Date	Change
1.0 /3103199	VK	9/22/2006	Original document

2.0 References

1] ANSI, *ANSI/IEEE C95.1-1991: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz*, The Institute of electrical and Electronics Engineers, Inc., New York, NY 10017, 1992

[2] Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997

[3] Thomas Schmid, Oliver Egger, and Niels Kuster, "Automated E-field scanning system for dosimetric assessments", *IEEE Transaction on Microwave Theory and Techniques*, vol. 44, pp. 105-113, Jan. 1996.

[4] Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetic evaluation of mobile communications equipment with know precision", IEICE Transactions on Communications, vol. E80-B, no. 5, pp.645-652, May 1997.

5] NIS81, NAMAS, "The treatment of uncertainty in EMC measurement", Tech. Rep., NAMAS Executive, National Physical Laboratory, Teddinton, Middlesex, England, 1994.

6] Barry N. Tayor and Chris E. Kuyatt, "Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology, 1994.

3.0 Introduction

The MCD3000 USB connected 1xEVDO Data Modemwas evaluated for SAR in accordance with the requirements for RF Exposure compliance testing defined in FCC OET Bulletin 65, Supplement C (Edition 01-01). Testing was performed at the Intertek facility in Lexington, Kentucky.

For the evaluation, the dosimetric assessment system DASY4 was used. The phantom employed was the "SAM Twin Phantom". The total uncertainty for the evaluation of the spatial peak SAR values averaged over a cube of 1g tissue mass had been assessed for this system to be ±21.9%.

The MCD3000 was tested at the maximum output power measured by Intertek. Maximum output power measurements are tabulated under **Heading 11.0 - Tabular Test Results**.

The maximum spatial peak SAR value for the sample device averaged over 1g was found to be:

Phantom	Position	Worst Case Extrapolated SAR_{1g} mW/g
Flat Section (Body Mode)	1880.0 MHz; Antenna partially open at 45°; Installed in Compaq Presario V4000 laptop	**0.738**

Based on the worst-case data presented above, the MCD3000 was found to be **compliant** with the 1.6 mW/g requirement defined in OET Bulletin 65, Supplement C (Edition 01-01).

Modifications made to test sample

Intertek implemented no modifications.

4.0 Test Site Description

The SAR test site located at 731 Enterprise Drive, Lexington KY 40510 is comprised of the SPEAG model DASY 4 automated near-field scanning system, which is a package, optimized for dosimetric evaluation of mobile radios [3]. This system is installed in an ambient-free shielded chamber. The Ambient temperature is controlled to 22.2 $\pm 2^{O}$C. Because the HVAC operates as a closed system, the relative humidity remains constant at 50 $\pm$5%. During the SAR evaluations, the RF ambient conditions are monitored continuously for signals that might interfere with the test results. The tissue simulating liquid is also stored in this area in order to keep it at the same constant ambient temperature as the room.

Figure 1: Intertek SAR Test Site

Measurement Equipment

The following major equipment/components were used for the SAR evaluations:

SAR Measurement System			
EQUIPMENT	**SPECIFICATIONS**	**S/N #**	**Cal. Due**
Robot	**Stäubli RX60L**	597412-01	N/A
	Repeatability: ± 0.025mm Accuracy: 0.806×10^{-3} degree Number of Axes: 6		
E-Field Probe	**EX3DV3**	3516	10/20/2006
	Frequency Range: 900MHz to 6GHz Probe Linearity: ± 0.2 dB (30 MHz to 6 GHz) Length: 34.5 cm Distance between the probe tip and the dipole center: 2.7 mm Tip Diameter: 2.4 mm Calibration: 900, 1800, 2450, 5200 and 5800 MHz for head & body tissue simulating liquid		
Data Acquisition	**DAE4**	358	3/2007
	Measurement Range: 1µV to >200mV Input offset Voltage: < 1µV (with auto zero) Input Resistance: 200 M		
Phantom	**SAM Twin V4.0**	TP-1243	N/A
Complies with IEEE P1528-2003	Type SAM Twin, Homogenous Shell Material: Fiberglass Thickness: 2 ± 0.2 mm Capacity: 20 liter Size of the flat section: approx. 320 x 230 mm		
Device holder	Non-conductive holder supplied with DASY4, dielectric constant less than 5.0	N/A	N/A
Network Analyzer	**Agilent 8753ES**	US39173983	8/14/2007
	Frequency Range: 30KHz – 6.0 GHz		
Signal Generator	**Agilent 8648B**	4037A03337	8/15/2007
	Frequency Range: 9KHz – 2 GHz		
Spectrum Analyzer	**Rohde & Schwarz FSP**	1164.4391.07	8/2/2007
	Frequency Range: 9KHz – 7 GHz		
Wireless Communications Test Set	**Agilent 8960**	3130	10/10/2007

Measurement Uncertainty

The Table below includes the uncertainty budget suggested by the IEEE Std 1528-200X and determined by SPEAG for the DASY4 measurement System

Error Description	Uncertainty Value	Prob. Dist.	Div.	c_i (1g)	c_i (10g)	Std.Unc. (1g)	Std.Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±5.9%	N	1	1	1	±5.9%	±5.9%	∞
Axial Isotropy	±4.7%	R	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effect	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Conditions	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	√3	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	√3	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Test sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	√3	1	1	±2.9%	±2.9%	∞
Phantom and Tissue Parameters								
Phantom Uncertainty	±4.0%	R	√3	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (target)	±5.0%	R	√3	0.64	0.43	±1.8%	±1.2%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.64	0.43	±1.6%	±1.1%	∞
Liquid Permittivity (target)	±5.0%	R	√3	0.6	0.49	±1.7%	±1.4%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.6	0.49	±1.5%	±1.2%	∞
Combined Standard Uncertainty						±10.9%	±10.7%	387
Expanded STD Uncertainty						**±21.9%**	**±21.4%**	

Notes.

1. Worst Case uncertainty budget for DASY4 assessed according to IEEE 1528. The budget is valid for the frequency range 300 MHz – 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerably smaller.

Measurement Traceability

All measurements described in this report are traceable to National Institute of Standards and Technology (NIST) standards or appropriate national standards.

5.0 Job Description

The MCD3000 USB connected 1xEVDO Data Modemhas been tested to the requirements defined in OET Bulletin 65, Supplement C (Edition 01-01) at the request of:

Manufacturer of the device:	Novatel Wireless 9645 Scranton Rd, Suite 205 San Diego, CA, 92121
Model number of the device:	MCD3000 / U720 / USB720
Name of contact:	John Spall
Telephone:	(858) 812-3477
E-mail:	jspall@nvtl.com
Manufacturer of the radio:	Novatel Wireless
Model Number of the radio:	ES720
Serial Number of the radio:	LI200706200167
EUT receive date:	8/21/2006
EUT received condition:	Good condition production unit
Test start date:	9/12/2006
Test end date:	9/13/2006

Test Sample Description

The MCD3000 is a USB-connected CDMA2000 1x Ev-Do (Rev 0) modem which can be used in either desktop or laptop applications. USB connected 1xEVDO Data Modem

Test sample		
Model	MCD3000	
FCC ID	**PKRNVWMCD3000**	
Device Category	Portable	
RF Exposure Category	General Population/Uncontrolled Environment	
System	CDMA-2000 1x RTT / 1x Ev-Do, Rev 0	
Frequency Band	824.7 MHz – 848.31 MHz (Cell) ; 1851.25 MHz – 1908.75 MHz (PCS)	
Mode(s) of Operation	CDMA-2000 1x RTT	CDMA-2000 1x Ev-Do, Rev 0
Duty Cycle	1:1	1:1
Maximum output power (measured by Intertek at the module's external RF connector)	24.03 dBm (252.93 mW)	24.16 dBm (260.62 mW)

Test Sample Antenna(s)		
Type	Main antenna: Monopole	Diversity antenna: Planar Inverted F Antenna
Configuration	Flip-up (0° - 90°)	Fixed / Planar
Dimensions	35 mm length	18 mm by 25 mm
Location	Hinge assembly on side of MCD3000	Mounted on inside of top cover
Gain (Worst Case)	3dBi (Cell and PCS bands)	0-1dBi (Cell and PCS bands)

Test sample Accessories	
Battery type	None
Belt clip	None

Test Signal Mode	
Test Commands	
Base Station Simulator	X

Test Sample Pictures:

Internal and external test sample pictures can by found in the following accompanying documents:

MCD3000 Internal Photographs.pdf
MCD3000 External Photographs.pdf

6.0 System Verification

Dipole System Validation

Prior to the assessment, the system was verified to be within ±10% of the specifications by using the system validation kit. The validation was performed at 900 MHz and 1800MHz using head tissue.

Figure 2: Photograph of System Verification (900MHz Dipole Positioned at Flat Phantom)[1]

[1] A similar positioning of an 1800MHz dipole was used.

Reference Dipole Validation – CDMA Cell Band Tests								
Frequency Measure (MHz)	**Dipole Type**	**Dipole Serial Number**	**Fluid Type**	**Dipole Power Input**	**Cal. Lab SAR (1g)**	**Measured SAR (1g)**	**% Error SAR (1g)**	**Date**
900	D900V2	13	900 MHz Head	1W	10.6	11.09	4.62	9/12/2006

Dipole dimensions: L=150.2 mm, D=3.6 mm
The following information, regarding the impedance of the D900V2, S/N #: 013 dipole was supplied by SPEAG:

Feed-point impedance at 900 MHz: Re{Z} = 50.3 Ohm; Im{Z} = 0.7 Ohm
Return Loss at 900 MHz: -41.9 dB

Reference Dipole Validation – CDMA PCS Band Tests								
Frequency Measure (MHz)	**Dipole Type**	**Dipole Serial Number**	**Fluid Type**	**Dipole Power Input**	**Cal. Lab SAR (1g)**	**Measured SAR (1g)**	**% Error SAR (1g)**	**Date**
1800	D1800V2	224	1800 MHz Head	1W	39.7	37.47	5.62	9/13/2006

Dipole dimensions: L=72.7 mm, D=3.6 mm
The following information, regarding the impedance of the D1800V2, S/N #: 224 dipole was supplied by SPEAG:

Feed-point impedance at 1800 MHz: Re{Z} = 50.4 Ohm; Im{Z} = -3.1 Ohm
Return Loss at 1800 MHz: -30.2 dB

Tissue Simulating Liquid Description and Validation

Simulation Liquid; Frequency: 900 MHz		
Ingredient	**Head**	**Body**
Water	41.45 %	52.4 %
Sugar	56.0 %	45.0 %
Salt	1.45 %	1.4 %
Bactericide	0.1 %	0.1 %
HEC	1.0 %	1.0 %

Simulation Liquid; Frequency: 1900 MHz		
Ingredient	**Head**	**Body**
Water	54.9	70.45
NaCl	0.18	0.36
Sugar	0	0
HEC	0	0
Bactericide	0	0
Triton X-100	0	0
DGBE	44.92	29.18

Note: The amounts of each ingredient specified in the tables are not the exact amounts of the final test solution. The final test solution was adjusted by adding small amounts of the appropriate ingredient to calibrate the solution to meet the proper dielectric parameters.

The ambient temperature of the test site, as well as the temperature of the tissue simulating fluid, were recorded on each day of testing, as shown in the table below:

Date	Ambient Temperature(°F)	Muscle Simulating Liquid Temperature (°F) f=900MHz	Head Simulating Liquid Temperature (°F) f=900MHz	Muscle Simulating Liquid Temperature (°F) f=1800MHz	Head Simulating Liquid Temperature (°F) f=1800MHz
9/12/2006	72.2	71.0	70.9	Not used	Not used
9/13/2006	72.9	Not used	Not used	70.7	70.0

The dielectric parameters were verified prior to assessment using the HP 8753A Network Analyzer. The dielectric parameters (ε_r, σ) on each day of testing were as follows:

Head Tissue Parameters – CDMA Cell Band Tests								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
813	41.6	42.7	2.64	20.7	0.9	0.94	3.96	9/12/2006
900	41.5	41.9	0.96	20.2	0.97	1.01	4.20	9/12/2006
Body Tissue Parameters – CDMA Cell Band Tests								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
813	55.3	53.5	3.25	22.3	0.97	1.01	3.91	9/12/2006
900	55	53.2	3.27	21.9	1.05	1.10	4.36	9/12/2006

Head Tissue Parameters - CDMA PCS Band Tests								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
1800	40	40.87	2.17	13.3	1.4	1.33	4.93	9/13/2006
Body Tissue Parameters - CDMA PCS Band Tests								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
1880	53.3	52.6	1.31	15.02	1.52	1.57	3.28	9/13/2006

Maximum mass density $\rho = 1$ g/cm^3
Maximum deviation of the dielectric parameters from the recommended values was 4.93 %.
During the measurements, the liquid level was maintained to a level of 15 cm with a tolerance of ±0.2 cm.

7.0 Evaluation Procedures

Prior to any testing, the appropriate fluid was used to fill the phantom to a depth of 15 cm ±0.2cm. The fluid parameters were verified and the dipole validation was performed as described in the previous sections.

Test Positions:

The Device was positioned against the SAM and flat phantom using the exact procedure described in Supplement C Edition 01 – 01 of Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997.

Reference Power Measurement:

The measurement probe was positioned at a fixed location above the reference point. A power measurement was made with the probe above this reference position so it could used for the assessing the power drift later in the test procedure.

Coarse Scan:

A coarse area scan with a horizontal grid spacing of 15 x 15 mm was performed in order to find the approximate location of the peak SAR value. This scan was performed with the measurement probe at a constant height in the simulating fluid. A two dimensional spline interpolation algorithm was then used to determine the peaks and gradients within the scanned area.

Zoom Scan:

A zoom scan was performed around the approximate location of the peak SAR as determined from the coarse scan. The zoom scan was comprised of a measurement volume of 30 x 30 x 30 mm based on 7 x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

Data Extrapolation:

Since the center of the dipoles in the measurement probe are 2.7 mm away from the tip of the probe, and the distance between the surface and the lowest measurement point is 1.6 mm the data at the surface was extrapolated. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in the Z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

The maximum interpolated value was searched with a straightforward sorting algorithm. Around this maximum, the SAR values averaged over the spatial volumes (1g or 10g) were computed using a 3-D spline interpolation algorithm. The 3-D spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y and z directions). The volume was integrated with a trapezoidal algorithm. 1000 points (10 x 10 x 10) were interpolated to calculate the average.

All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Reference Power Measurement:

The probe was positioned at precisely the same reference point and the reference power measurement was repeated. The difference between the initial reference power and the final one is referred to as the power drift. If the power drift exceeded 5% of the final peak SAR value, the measurement was repeated.

RF Ambient Activity:

During the entire SAR evaluation, the RF ambient activity was monitored using a spectrum analyzer with an antenna connected to it. The spectrum analyzer was tuned to the frequency of measurement and with one trace set to max hold mode. In this way, it was possible to determine if at any point during the SAR measurement there was an interfering ambient signal. If an ambient signal was detected, then the SAR measurement was repeated.

8.0 Test Configuration / Test Photographs

For the purpose of this evaluation, the MCD3000 was considered to be an Access Terminal (AT) which operates under the CDMA2000 High Rate Packet Data, Rev. 0, 1x Ev-Do protocol. The device can be used in either desktop or laptop applications. The test plan that was agreed upon by Intertek and Novatel Wireless placed the MCD3000 in its portable (laptop) application.

Note: The MCD3000 was configured for testing according to the FCC document, "SAR Measurement Procedures for 3G Devices, June 2006". The MCD3000 was configured for measurements in CDMA2000 1xRTT and 1x Ev-Do modes using Qualcomm QPST Version 2.7 Build 231 software. Then, an Agilent 8960 base station sumulator was used to place the MCD3000 in a call at the appropriate channel.

Output Power Verification:

Output power verification of the MCD3000 was performed according to the FCC 3G document. Results of this verification are shown under **Heading 11.0 - Tabular Test Results**.

SAR Measurements:

The MCD3000 is capable of operating in CDMA2000 1xRTT and 1x Ev-Do modes. According to the FCC 3G document, SAR is not required for 1xRTT mode when the maximum average output power of each channel is less than 0.25 dBm higher than that measured in the 1x Ev-Do mode. **Heading 10.0 - Engineering Judgments** provides further details on the output power comparison that was used to justify the exemption of Body-mode scans in 1xRTT mode.

A selection of 3 different laptops were provided by Novatel Wireless in order to test the MCD3000 in as many positions relative to the body (flat phantom) as possible. Bearing in mind that the device contains a flip antenna that can open from 0° to 90°, tests were conducted with the antenna positioned at 0°, 45° and 90°. In each case, the MCD3000 was plugged into the USB port which would be closest to the human body during a portable application, i.e. as close as possible to the base of the laptop. The minimum distance from the device to the horizontal plane define by the base (or 'legs') of the laptop was measured. This distance was verified and maintained when inverting the laptop for mounting below the flat phantom.

Note: While USB ports can be found in various configurations such as 0° / 180° Horizontal and 0° / 180° Vertical, the current tests encompassed only the orientations in which it was typical to install the MCD3000. The sample was plugged in such that the antenna was free to flip through its three positions without obstruction.

Details on the selection of laptops are provided below:

Manufacturer	Model	Serial	Overall Dimensions (LxWxH)	Laptop Battery Details			AC Adapter Details	
				Model	mAh	Type	Model/Part	DC Output
Acer	BL51	62819766616	11"x14"x1.25"	BATBL50L8H	4800	Li-Ion	SADP-65KB	19V, 3.42A
Compaq	V4000	2CE61503GL	10.5"x14"x1.5"	HSTNN-LB09	4400	Li-Ion	380467-001	18.5V, 3.5A
HP	nx9600	CNF53300ZQ	11.5"X16"X2"	HSTNN-DB04	6600	Li-Ion	344500-003	19V, 9.5A

Figure 3 through Figure 8 show how the MCD3000 was positioned relative to each laptop:

Figure 3: MCD3000, as installed in the Acer laptop

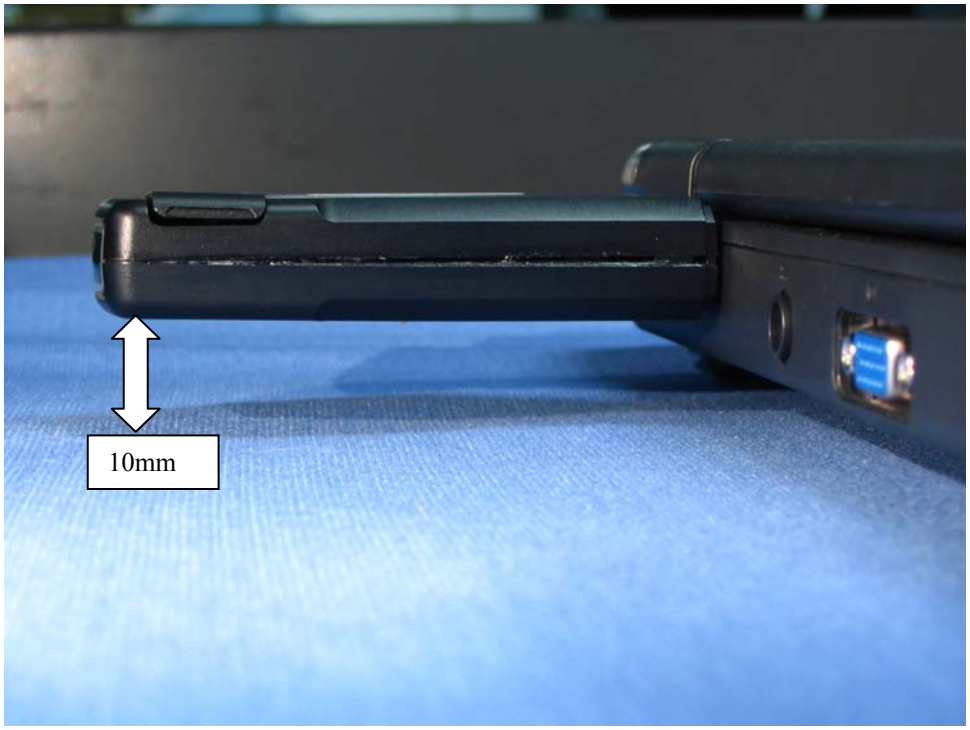

Figure 4: MCD3000 - Minimum distance to base of Acer laptop

Figure 5: MCD3000, as installed in the Compaq laptop

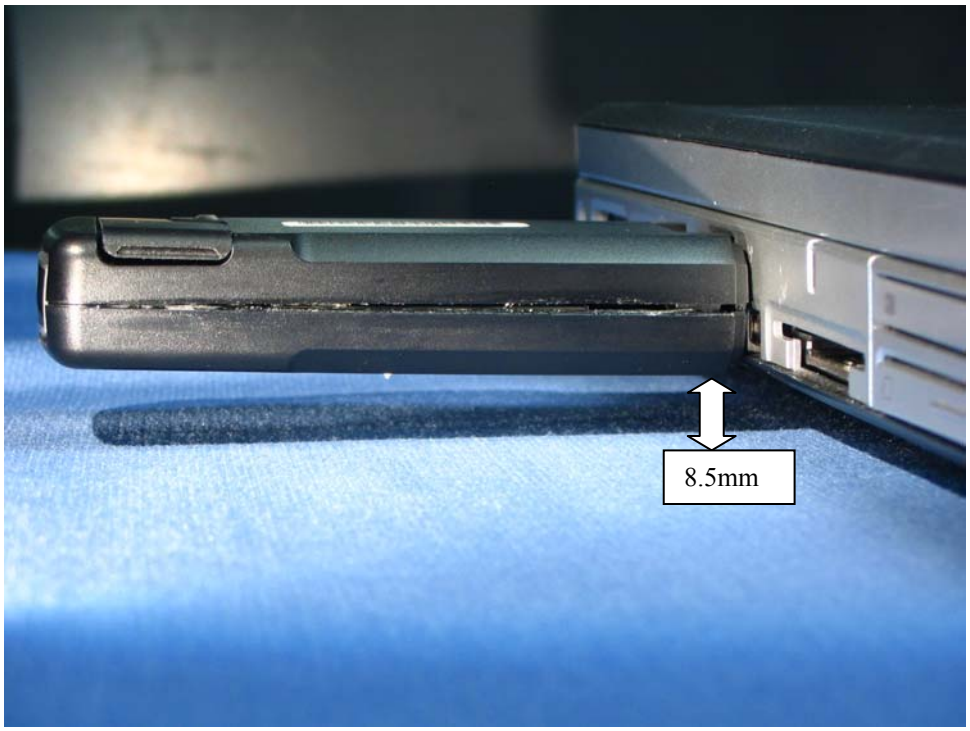

Figure 6: MCD3000 - Minimum distance to base of Compaq laptop

Figure 7: MCD3000, as installed in the HP laptop

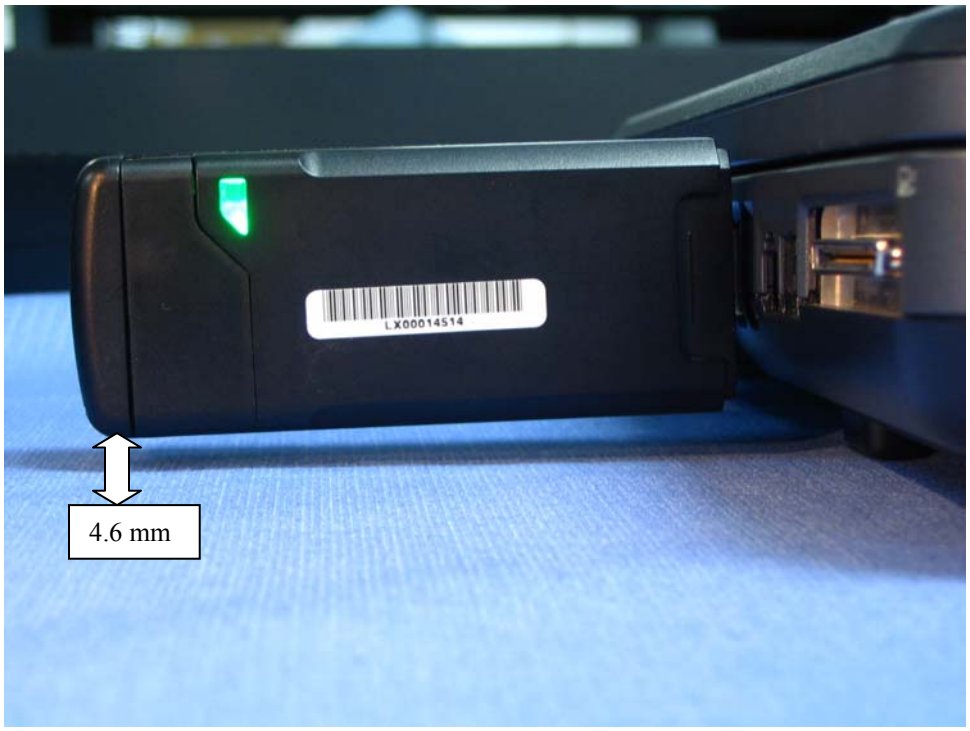

Figure 8: MCD3000 - Minimum distance to base of HP laptop

Test configuration pictures in Figure 9 through Figure 20 show how the MCD3000 was positioned in each laptop, while placed against the flat phantom:

Figure 9: MCD3000 – Acer Laptop Under Flat Phantom

Figure 10: MCD3000 - Acer Laptop with Antenna at 0 Degrees

Figure 11: MCD3000 - Acer Laptop with Antenna at 45 Degrees

Figure 12: MCD3000 - Acer Laptop with Antenna at 90 Degrees

Figure 13: MCD3000 – Compaq Laptop Under Flat Phantom

Figure 14: MCD3000 – Compaq Laptop with Antenna at 0 Degrees

Figure 15: MCD3000 – Compaq Laptop with Antenna at 45 Degrees

Figure 16: MCD3000 – Compaq Laptop with Antenna at 90 Degrees

Figure 17: MCD3000 – HP Laptop Under Flat Phantom

Figure 18: MCD3000 – HP Laptop with Antenna at 0 Degrees

Figure 19: MCD3000 – HP Laptop with Antenna at 45 Degrees

Figure 20: MCD3000 – HP Laptop with Antenna at 90 Degrees

9.0 Criteria

The following FCC limits for SAR apply to devices operating in General Population/Uncontrolled Exposure environment:

Exposure (General Population/Uncontrolled Exposure environment)	SAR (W/kg)
Average over the whole body	0.08
Spatial Peak (1g)	1.60
Spatial Peak for hands, wrists, feet and ankles (10g)	4.00

10.0 Engineering Judgments

The MCD3000 was evaluated according to a test plan that was agreed upon by Intertek and Novatel Wireless (see **Heading 8. 0 Test Configuration / Test Photographs**).

The MCD3000 can operate in CDMA2000 1xRTT and 1x Ev-Do modes. According to the FCC 3G document, SAR is not required for 1xRTT mode when the maximum average output power of each channel is less than 0.25 dBm higher than that measured in the 1x Ev-Do mode. Therefore, an output power comparison was used to justify the exemption of Body-mode scans in 1xRTT mode. In no case did did the maximum average output power in 1x RTT mode exceed that measured in 1x Ev-Do mode by more than 0.25 dBm. The greatest difference was +0.22 dBm.

	Average Power (dBm)					
	Cell Channel			PCS Channel		
	1013	384	777	25	600	1175
1x Ev-Do Power	23.94	23.80	23.61	23.54	23.78	23.28
1x RTT Power	23.89	23.88	23.83	23.73	23.73	23.27
Difference: 1x RTT - 1x Ev-Do	-0.05	0.08	**0.22**	0.19	-0.05	-0.01

In 1xRTT mode, the device was placed in a call with power control bits set to “All Bits Up”. In 1x Ev-Do mode, a call was made with power control bits set to “All Bits Up”. The Reverse Data Channel rate was set to 153.6 kbps. FTAP was set to 307.2 kbps, transmitting in all slots.

11.0 Tabular Test Results

The results on the following page(s) were obtained when the device was tested in the condition described in this report. Detailed measurement data and plots, which reveal information about the location of the maximum SAR with respect to the device, are referenced under **Heading 12.0 - Graphical SAR Scan Results**. The extrapolated SAR results account for the drift measurements using the following formula:

Extrapolated SAR = Measured SAR*10^-(Drift/10)

For positive drift values no extrapolation was performed. A dashed line will appear in the table for the extrapolation values in this case.

Conducted Power Measurements

These conducted power measurements for the MCD3000 were made using an Agilent 8960 base station simulator. Cable loss was accounted for within the test set by offsetting the readings by the appropriate amounts. Readings were taken at the RF port that was present under the MCD3000's flip-antenna.

Measurements are provided in the table below for the MCD3000 operating in both CDMA2000 1xRTT and 1x Ev-Do modes. In 1xRTT mode, the device was placed in a call with power control bits set to "All Bits Up". In 1x Ev-Do mode, a call was made with power control bits set to "All Bits Up". The Reverse Data Channel rate was set to 153.6 kbps. FTAP was set to 307.2 kbps, transmitting in all slots.

	Max Power (dBm)					
	Cell Channel			**PCS Channel**		
	1013	**384**	**777**	**25**	**600**	**1175**
1x Ev-Do Power	**24.16**	23.97	24.04	23.76	23.90	23.66
1x RTT Power	24.00	**24.03**	23.98	23.93	23.82	23.30

Body Mode Tabular Test Results

During the test, the RF output power of the test sample varied by a small amount due to heat and battery output power variations in the laptop. To take this power drift into account, a reference measurement was performed at a predefined position in the fluid just before and just after each SAR scan. The difference in these values is recorded in the table below as the SAR drift. The 1-g SAR was extrapolated for drift and is shown in the table below.

Flat Phantom; Body / Data Mode; 1:1 Mode; Cell Band										
Freq. (MHz)	**Ant. Pos.**	**Laptop Used**	**Test Position**	**Carry Case**	**Other Attachments**	**SAR Drift (dB)**	**Measured 1-g SAR (mW/g)**	**Meas. 10g-SAR (mw/g)**	**Extrapolated Worst Case 1-g SAR (mW/g)**	**Extrapolated Worst Case 10-g SAR (mW/g)**
836.52000	**0°**	**Acer**	**Base of laptop flat against phantom**	**None**	**None**	**-0.107**	**0.508**	**0.341**	**0.521**	**0.350**
836.52000	45°	Acer	Base of laptop flat against phantom	None	None	-0.193	0.385	0.260	0.402	0.272
836.52000	90°	Acer	Base of laptop flat against phantom	None	None	-0.550	0.348	0.240	0.395	0.272
836.52000	0°	Compaq	Base of laptop flat against phantom	None	None	-0.243	0.436	0.296	0.461	0.313
836.52000	45°	Compaq	Base of laptop flat against phantom	None	None	-0.527	0.321	0.217	0.362	0.245
836.52000	90°	Compaq	Base of laptop flat against phantom	None	None	-0.050	0.353	0.239	0.357	0.242
836.52000	0°	HP	Base of laptop flat against phantom	None	None	-0.377	0.389	0.273	0.424	0.298
836.52000	45°	HP	Base of laptop flat against phantom	None	None	0.386	0.283	0.196	-	-
836.52000	90°	HP	Base of laptop flat against phantom	None	None	0.023	0.249	0.176	-	-

Flat Phantom; Body / Data Mode; 1:1 Mode; PCS Band										
Freq. (MHz)	**Ant. Pos.**	**Laptop Used**	**Test Position**	**Carry Case**	**Other Attachments**	**SAR Drift (dB)**	**Measured 1-g SAR (mW/g)**	**Meas. 10g-SAR (mw/g)**	**Extrapolated Worst Case 1-g SAR (mW/g)**	**Extrapolated Worst Case 10-g SAR (mW/g)**
1880.00000	0°	Acer	Base of laptop flat against phantom	None	None	-0.025	0.114	0.072	0.115	0.073
1880.00000	45°	Acer	Base of laptop flat against phantom	None	None	0.004	0.160	0.100	-	-
1880.00000	90°	Acer	Base of laptop flat against phantom	None	None	0.177	0.135	0.085	-	-
1880.00000	0°	Compaq	Base of laptop flat against phantom	None	None	0.128	0.270	0.169	-	-
1880.00000	**45°**	**Compaq**	**Base of laptop flat against phantom**	**None**	**None**	**0.048**	**0.738**	**0.436**	-	-
1880.00000	90°	Compaq	Base of laptop flat against phantom	None	None	-0.190	0.662	0.408	0.692	0.426
1880.00000	0°	HP	Base of laptop flat against phantom	None	None	0.067	0.472	0.276	-	-
1880.00000	45°	HP	Base of laptop flat against phantom	None	None	-0.079	0.516	0.314	0.525	0.320
1880.00000	90°	HP	Base of laptop flat against phantom	None	None	-0.062	0.359	0.215	0.364	0.218

12.0 Graphical SAR Scan Results

Graphical SAR scan results can by found in the following accompanying document:

MCD3000 Graphical SAR Scan Results.pdf