REPORT ON

Specific Absorption Rate Testing of the Novatel Wireless Limited
U730 Wireless PCMCIA Card

FCC ID: NBZNRMU-730

Report No WS614714/01 Issue 1 **November 2005**

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FCC ID NBZNRM-U730

PREPARED FOR
Novatel Wireless Limited
Suite 200, 6715 - 8th Street N.E.
Calgary
Alberta, T2E 7H7
Canada

ATTESTATION The wireless portable device described within this report has been shown to be capable of compliance for localised specific absorption rate (SAR) for FCC standard Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) and RSS-102 Issue 1 (Provisional) September 25, 1999 of 1.6 W/kg.

The measurements shown in this report were made in accordance with the procedures specified in Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01).

All reported testing was carried out on a sample of equipment to demonstrate compliance with the above standards. The sample tested was found to comply with the requirements in the applied rules.

V Kerai
SAR Test Engineer

APPROVED BY

M Jenkins
Authorised Signatory

DATED 4th November 2005

Note: The test results reported herein relate only to the item tested as identified above and on the Status Page.

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SECTION 1

REPORT SUMMARY

Specific Absorption Rate Testing of the Novatel Wireless Limited U730 Wireless PCMCIA Card

Max 1g SAR (W/kg)	1.366
The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg level defined in Supplement C (Edition 01-01) to OET Bulletin 65 (97-01).	

1.1 STATUS

MANUFACTURING DESCRIPTION	PCMCIA Wireless Card
STATUS OF TEST	Specific Absorption Rate Testing
APPLICANT	Novatel Wireless Limited
POWER CLASS	GSM 850/900 Class 4
	GSM DCS 1800 / PCS 1900 Class 1
	EGPRS GSM 850 / EGSM 900 Class E2
	W-CDMA Class 3
GPRS CLASS	Class B
MULTI-SLOT CLASS	10 (4Dn;2Up;Sum5)
MANUFACTURER	Novatel Wireless Limited
TYPE OR MODEL NUMBER	Novatel U730
HARDWARE VERSION	Version 1
SOFTWARE VERSION	Revision 18
FCC ID	NBZNRMU-730
IMEI NUMBER	001018-00-036344-1
HOST 1 MANUFACTURER & MODEL	Averatec 6200 Series
COUNTRY OF MANUFACTURE	China
IC ID	3715A-MS6833
HOST 2 MANUFACTURER & MODEL	Dell Inspiron 9300
COUNTRY OF MANUFACTURE	Ireland
FCC ID	E2K24GBRL
IC ID	1514B-24GBRL
HOST 3 MANUFACTURER & MODEL	Dell Latitude D600
COUNTRY OF MANUFACTURE	Ireland
FCC ID	E2K24CLNS
IC ID	1614B-24GLNS

TEST SPECIFICATIONS:

1. FCC Publication Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01): Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields – Additional Information for evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions

REFERENCES:

2. IEEE 1528 – 2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques

BABT REGISTRATION NUMBER: WS614714

RECEIPT OF TEST SAMPLES: 11th October 2005

START OF TEST: 27th October 2005

FINISH OF TEST: 29th October 2005

1.2 SUMMARY

The device supplied for Specific Absorption Rate (SAR) testing was a Novatel Wireless Inc U730 CDMA/GPRS/EGPRS/HSDPA (EDGE) module, designed for modular integration into hosts. SAR assessment was performed on the module with three host laptops as follows:

- Host 1: Averatec 6200Series
- Host 2: Dell Inspiron 9300
- Host 3: Dell Latitude D600

The Cube Phantom dimensions were 210mm x 210mm x 210mm with a sidewall thickness of 2.00mm. The phantom was filled to a minimum depth of 150mm with the appropriate Body simulant liquid. The dielectric properties were in accordance with the requirements for the dielectric properties specified in Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01).

Testing was conducted at the maximum power relevant for each band and modulation scheme. This was achieved using a Universal Radio Communications test set.

Body SAR assessment was performed with the three host laptop inverted such that the rear of the host laptop was facing the bottom of the cube phantom and the rear of the U730 card was facing the phantom. Testing was performed on the U730 card in Host 1 at the top, middle and bottom frequency of each band with 10mm separation distance from the card to the bottom of the Cube Phantom. Host 1, which provided the smallest separation distance from the card to the bottom of the Cube Phantom was used to perform SAR testing in three channels to establish the worst-case frequency. Further testing was carried out with the U730 card in Host 2 and Host 3 in the worst case frequency identified with separation distances of 18mm and 14mm respectively. Host 2 and 3 were positioned such that the base of the laptop was in contact with the bottom of the Cube Phantom to ensure the worst case SAR is obtained.

For body SAR assessment[1], testing was performed for both the 850MHz and 1900MHz frequency bands in the following test modes:

- W-CDMA HSDPA (High-Speed Downlink Packet Access)
- W-CDMA RMC (Reference Measurement Channel)
- GPRS (General Packet Radio Service)
- GSM EDGE (Enhanced Data for Global Evolution)

In HSDPA mode the EUT was transmitting with HSDPA (16QAM) modulation with TS2 and TS3 active. In GPRS mode, TS3 and TS4 were active, (CS1) with GMSK modulation. In EDGE mode, TS2 and TS3 were active, (MCS-5) with 8PSK modulation and in UMTS mode the EUT was transmitting with QPSK modulation.

Included in this report are descriptions of the test method; the equipment used and an analysis of the test uncertainties applicable and diagrams indicating the locations of maximum SAR for each test position along with photographs indicating the positioning of the module with respect to the body as appropriate.

The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg. Level defined in Supplement C (Edition 01-01) to OET Bulletin 65 (97-01).

1.3 TEST RESULT SUMMARY

SYSTEM PERFORMANCE / VALIDATION CHECK RESULTS

Prior to formal testing being performed a System Check was performed in accordance with OET 65 Supplement C (Edition 01-01) and the results were compared against published data in Standard IEEE 1528-2003 [3]. The following results were obtained: -

Date	Dipole Used	Frequency (MHz)	Max 1g SAR (W/kg)	Percentage Drift on Reference	Max 10g SAR (W/kg)	Percentage Drift on Reference
27/10/2005	900	907.5	10.94	1.26%	7.01	1.66%
28/10/2005	1900	1929.0	38.70	-2.52%	20.18	-1.58%
29/10/2005	1900	1929.0	39.60	-0.35%	20.51	0.03%

*Normalised to a forward power of 1W

WCDMA FDD Band 2 HSDPA Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	9440	1888.0	0.37	0.464	0.276	0.17	Figure 4
10mm	Rear Facing	1	12	1852.5	0.35	0.438	0.279	1.19	Figure 5
10mm	Rear Facing	1	9538	1907.6	0.32	0.401	0.253	-7.30	Figure 6
18mm	Rear Facing	2	9440	1888.0	0.30	0.359	0.224	-6.15	Figure 7
14mm	Rear Facing	3	9440	1888.0	0.25	0.304	0.174	-2.92	Figure 8
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

WCDMA FDD Band 5 HSDPA Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	4183	836.6	0.13	0.159	0.100	0.00	Figure 9
10mm	Rear Facing	1	4132	826.4	0.09	0.107	0.072	0.04	Figure 10
10mm	Rear Facing	1	4233	846.6	0.15	0.171	0.119	-1.38	Figure 11
18mm	Rear Facing	2	4233	846.6	0.35	0.415	0.262	-7.55	Figure 12
14mm	Rear Facing	3	4233	846.6	0.22	0.267	0.182	3.44	Figure 13
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

1.3 TEST RESULT SUMMARY

WCDMA FDD Band 2 RMC (Reference Measurement Channel) Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	9440	1888.0	0.44	0.549	0.351	-0.25	Figure 14
10mm	Rear Facing	1	12	1852.5	0.45	0.551	0.349	-1.37	Figure 15
10mm	Rear Facing	1	9538	1907.6	0.41	0.496	0.316	-0.30	Figure 16
18mm	Rear Facing	2	12	1852.5	0.31	0.387	0.251	-0.02	Figure 17
14mm	Rear Facing	3	12	1852.5	0.36	0.429	0.267	-1.33	Figure 18
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

WCDMA FDD Band 5 RMC (Reference Measurement Channel) Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	4183	836.6	0.11	0.128	0.090	2.20	Figure 19
10mm	Rear Facing	1	4132	826.4	0.15	0.173	0.122	-0.45	Figure 20
10mm	Rear Facing	1	4233	846.6	0.18	0.222	0.151	6.39	Figure 21
18mm	Rear Facing	2	4233	846.6	0.30	0.347	0.231	-1.66	Figure 22
14mm	Rear Facing	3	4233	846.6	0.29	0.356	0.248	0.14	Figure 23
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

1.3 TEST RESULT SUMMARY

1900 GPRS Multi-slot Class 10 Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	661	1880.0	0.85	1.035	0.639	2.22	Figure 24
10mm	Rear Facing	1	512	1850.2	0.79	0.971	0.602	-4.65	Figure 25
10mm	Rear Facing	1	810	1909.8	0.81	0.985	0.610	0.24	Figure 26
18mm	Rear Facing	2	661	1880.0	0.56	0.683	0.422	-2.25	Figure 27
14mm	Rear Facing	3	661	1880.0	0.53	0.643	0.372	-1.02	Figure 28
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

850 GPRS Multi-slot Class 10 Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	189	836.4	0.94	1.097	0.722	-1.77	Figure 29
10mm	Rear Facing	1	128	824.2	0.80	0.931	0.635	0.80	Figure 30
10mm	Rear Facing	1	251	848.8	0.95	1.114	0.769	0.24	Figure 31
18mm	Rear Facing	2	251	848.8	1.24	1.366	0.945	0.15	Figure 32
14mm	Rear Facing	3	251	848.8	1.03	1.195	0.831	-2.28	Figure 33
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

1.3 TEST RESULT SUMMARY

1900 GSM EDGE Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	661	1880.0	0.49	0.613	0.377	-1.03	Figure 34
10mm	Rear Facing	1	512	1850.2	0.45	0.555	0.356	0.21	Figure 35
10mm	Rear Facing	1	810	1909.8	0.50	0.620	0.369	-0.96	Figure 36
18mm	Rear Facing	2	810	1909.8	0.28	0.369	0.222	0.00	Figure 37
14mm	Rear Facing	3	810	1909.8	0.29	0.335	0.196	-3.28	Figure 38
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

850 GSM EDGE Test Mode BODY Specific Absorption Rate (Maximum SAR) 1g & 10g Results for the Novatel U730 Wireless PCMCIA Card in 3 Hosts

Position		Host Laptop	Channel Number	Frequency (MHz)	Max Spot SAR (W/kg)	Max 1g SAR (W/kg	Max 10g SAR (W/kg)	SAR Drift (%)	Area scan (Figure number)
Spacing From Phantom	Mobile Position								
10mm	Rear Facing	1	189	836.4	0.42	0.497	0.307	1.50	Figure 39
10mm	Rear Facing	1	128	824.2	0.36	0.411	0.277	1.60	Figure 40
10mm	Rear Facing	1	251	848.8	0.47	0.572	0.356	1.34	Figure 41
18mm	Rear Facing	2	251	848.8	0.55	0.631	0.419	-1.87	Figure 42
14mm	Rear Facing	3	251	848.8	0.39	0.462	0.318	-0.07	Figure 43
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g) & 2.0 W/kg (10g)									

1.4 CONDUCTED OUTPUT POWER MEASUREMENTS

Conducted Output Power Measurements for the Novatel U730 Module in HSDPA Mode

Mode	Band	Channel	Result - Conducted
HSDPA	850	Bottom	22.51dBm
HSDPA	850	Middle	22.54dBm
HSDPA	850	Top	22.36dBm
HSDPA	1900	Bottom	22.92dBm
HSDPA	1900	Middle	22.87dBm
HSDPA	1900	Top	23.12dBm

Conducted Output Power Measurements for the Novatel U730 Module in UMTS Mode

Mode	Band	Channel	Result - Conducted
UMTS	850	Bottom	22.38dBm
UMTS	850	Middle	22.15dBm
UMTS	850	Top	22.37dBm
UMTS	1900	Bottom	22.79dBm
UMTS	1900	Middle	22.90dBm
UMTS	1900	Top	22.50dBm

Conducted Output Power Measurements for the Novatel U730 Module in GPRS Mode

Mode	Band	Channel	Result - Conducted
GPRS	850	Bottom	31.90dBm
GPRS	850	Middle	31.72dBm
GPRS	850	Top	31.76dBm
GPRS	1900	Bottom	28.73dBm
GPRS	1900	Middle	28.99dBm
GPRS	1900	Top	28.99dBm

Conducted Output Power Measurements for the Novatel U730 Module in EDGE Mode

Mode	Band	Channel	Result - Conducted
EDGE	850	Bottom	30.17dBm
EDGE	850	Middle	30.00dBm
EDGE	850	Top	29.99dBm
EDGE	1900	Bottom	28.88dBm
EDGE	1900	Middle	29.17dBm
EDGE	1900	Top	29.14dBm

SECTION 2

TEST DETAILS

Specific Absorption Rate Testing of the Novatel Wireless Limited
U730 Wireless PCMCIA Card

2.1 SAR MEASUREMENT SYSTEM

2.1.1 ROBOT SYSTEM SPECIFICATION

The SAR measurement system being used is the IndexSAR SARA2 system, which consists of a Mitsubishi RV-E2 6-axis robot arm and controller, IndexSAR probe and amplifier and SAM phantom Head Shape. The robot is used to articulate the probe to programmed positions inside the phantom head to obtain the SAR readings from the DUT.

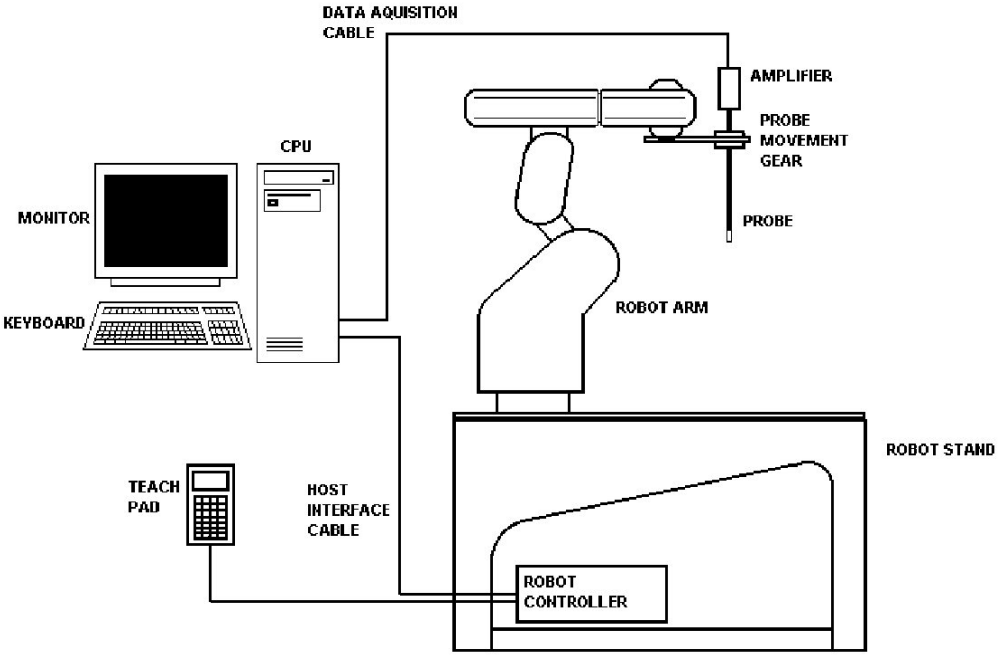

Figure 1: Schematic diagram of the SAR measurement system

The system is controlled remotely from a PC, which contains the software to control the robot and data acquisition equipment. The software also displays the data obtained from test scans.

The position and digitised shape of the phantom heads are made available to the software for accurate positioning of the probe and reduction of set-up time.
The SAM phantom heads are individually digitised using a Mitutoyo CMM machine to a precision of 0.001mm. The data is then converted into a shape format for the software, providing an accurate description of the phantom shell.

In operation, the system first does an area (2D) scan at a fixed depth within the liquid from the inside wall of the phantom. When the maximum SAR point has been found, the system will then carry out a 3D scan centred at that point to determine volume averaged SAR level.

2.1 SAR MEASUREMENT SYSTEM

2.1.2 PROBE AND AMPLIFIER SPECIFICATION

IXP-050 IndexSAR Isotropic Immersible SAR probe
The probes are constructed using three orthogonal dipole sensors arranged on an interlocking, triangular prism core. The probes have built-in shielding against static charges and are contained within a PEEK cylindrical enclosure material at the tip.
Probe calibration is described in the following section.

IFA-010 Fast Amplifier

Technical description of IndexSAR IFA-010 Fast probe amplifier
A block diagram of the fast probe amplifier electronics is shown below.

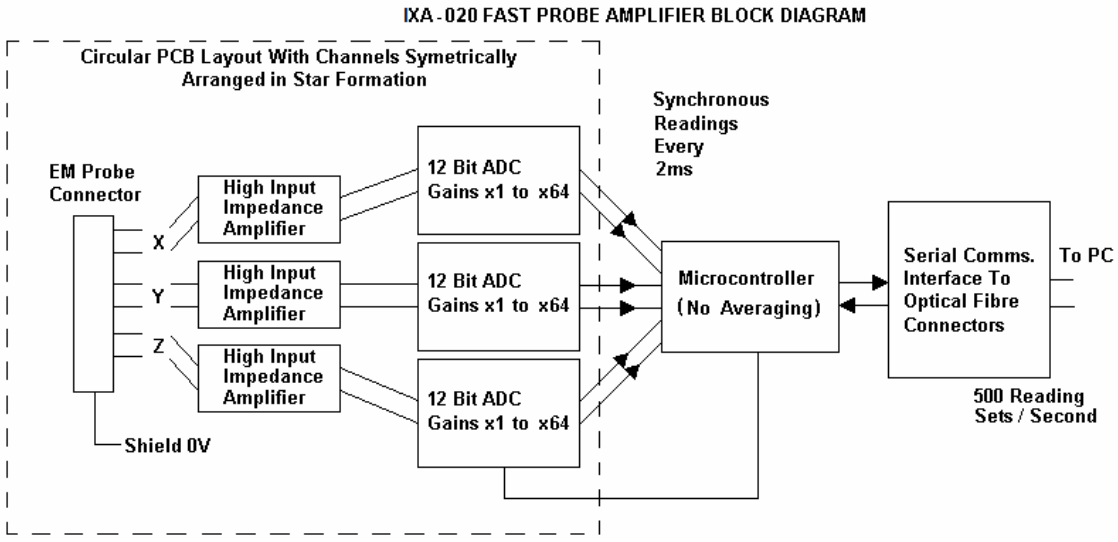

Figure 2: Block diagram of the fast probe amplifier electronic

This amplifier has a time constant of approx. 50µs, which is much faster than the SAR probe response time. The overall system time constant is therefore that of the probe (<1ms) and reading sets for all three channels (simultaneously) are returned every 2ms to the PC. The conversion period is approx. 1 µs at the start of each 2ms period. This enables the probe to follow pulse modulated signals of periods >>2ms. The PC software applies the linearization procedure separately to each reading, so no linearization corrections for the averaging of modulated signals are needed in this case. It is important to ensure that the probe reading frequency and the pulse period are not synchronised and the behaviour with pulses of short duration in comparison with the measurement interval need additional consideration.

Phantoms

The Cube phantom used is a Perspex Box IndexSAR item IXB-070. Dimensions of 200w x 200d x 200h (mm). This phantom is used with IndexSAR side bench IXM-030.

The Flat phantom used is a Rectangular Perspex Box IndexSAR item. Dimensions of 210w x 150d x 200h (mm). This phantom is used with IndexSAR upright bench. The phantom and robot alignment is assured by both mechanical and laser registration systems.

2.1 SAR MEASUREMENT SYSTEM

2.1.3 SAR MEASUREMENT PROCEDURE

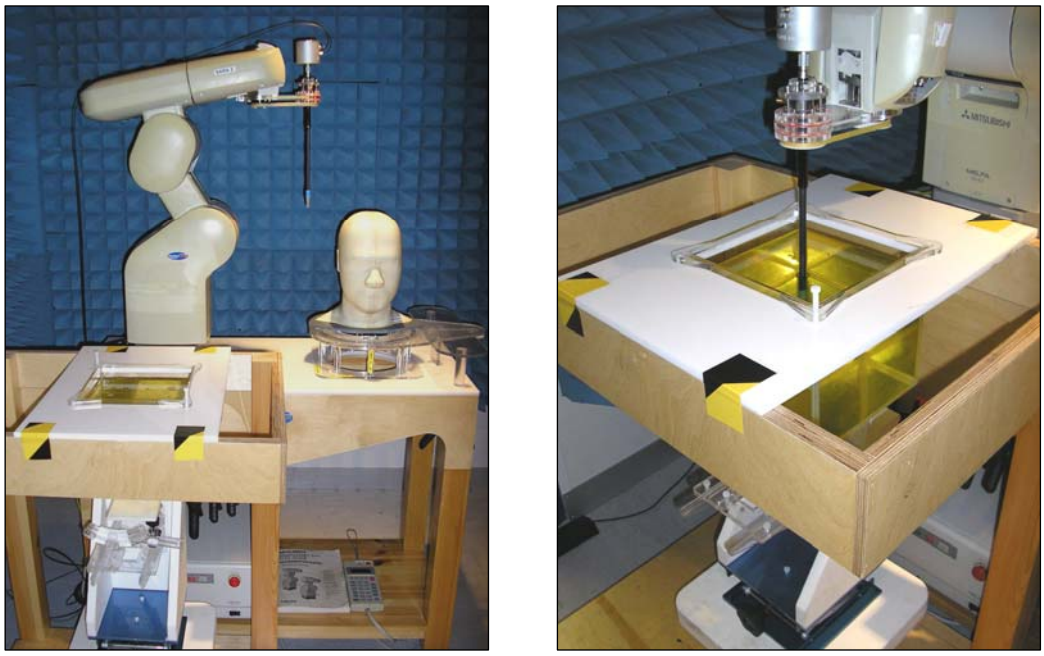

Figure 3: Principal components of the SAR measurement test bench

The major components of the test bench are shown in the picture above. A test set and dipole antenna control the handset via an air link and a low-mass phone holder can position the phone at either ear. Graduated scales are provided to set the phone in the 15 degree position. The upright phantom head holds approx. 7 litres of simulant liquid. The phantom is filled and emptied through a 45mm diameter penetration hole in the top of the head.

After an area scan has been done at a fixed distance of 8mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

SARA2 Interpolation and Extrapolation schemes
SARA2 software contains support for both 2D cubic B-spline interpolation as well as 3D cubic B-spline interpolation. In addition, for extrapolation purposes, a general n^{-th} order polynomial fitting routine is implemented following a singular value decomposition algorithm presented in [4]. A 4^{th} order polynomial fit is used by default for data extrapolation, but a linear-logarithmic fitting function can be selected as an option. The polynomial fitting procedures have been tested by comparing the fitting coefficients generated by the SARA2 procedures with those obtained using the polynomial fit functions of Microsoft Excel when applied to the same test input data.

Interpolation of 2D area scan
The 2D cubic B-spline interpolation is used after the initial area scan at fixed distance from the phantom shell wall. The initial scan data are collected with approx. 115mm spatial resolution and spline interpolation is used to find the location of the local maximum to within a 1mm resolution for positioning the subsequent 3D scanning.

2.1 SAR MEASUREMENT SYSTEM

2.1.3 SAR MEASUREMENT PROCEDURE

Extrapolation of 3D scan

For the 3D scan, data are collected on a spatially regular 3D grid having (by default) 6.4 mm steps in the lateral dimensions and 3.5 mm steps in the depth direction (away from the source). SARA2 enables full control over the selection of alternative step sizes in all directions.

The digitised shape of the head is available to the SARA2 software, which decides which points in the 3D array are sufficiently well within the shell wall to be 'visited' by the SAR probe. After the data collection, the data are extrapolated in the depth direction to assign values to points in the 3D array closer to the shell wall. A notional extrapolation value is also assigned to the first point outside the shell wall so that subsequent interpolation schemes will be applicable right up to the shell wall boundary.

Interpolation of 3D scan and volume averaging

The procedure used for defining the shape of the volumes used for SAR averaging in the SARA2 software follow the method of adapting the surface of the 'cube' to conform with the curved inner surface of the phantom (see Appendix C.2.2.1 in EN 50361:2001). This is called, here, the conformal scheme.

For each row of data in the depth direction, the data are extrapolated and interpolated to less than 1mm spacing and average values are calculated from the phantom surface for the row of data over distances corresponding to the requisite depth for 10g and 1g cubes. This results in two 2D arrays of data, which are then cubic B-spline interpolated to sub mm lateral resolution. A search routine then moves an averaging square around through the 2D array and records the maximum value of the corresponding 1g and 10g volume averages. For the definition of the surface in this procedure, the digitised position of the headshell surface is used for measurement in head-shaped phantoms. For measurements in rectangular, box phantoms, the distance between the phantom wall and the closest set of gridded data points is entered into the software.

For measurements in box-shaped phantoms, this distance is under the control of the user. The effective distance must be greater than 2.5mm as this is the tip-sensor distance and to avoid interface proximity effects, it should be at least 5mm. A value of 6 or 8mm is recommended. This distance is called **dbe** in EN 50361:2001.

For automated measurements inside the head, the distance cannot be less than 2.5mm, which is the radius of the probe tip and to avoid interface proximity effects, a minimum clearance distance of x mm is retained. The actual value of dbe will vary from point to point depending upon how the spatially-regular 3D grid points fit within the shell. The greatest separation is when a grid point is just not visited due to the probe tip dimensions. In this case the distance could be as large as the step-size plus the minimum clearance distance (i.e with x=5 and a step size of 3.5, **dbe** will be between 3.5 and 8.5mm).

The default step size (**dstep** in EN 50361:2001) used is 3.5mm, but this is under user-control. The compromise is with time of scan, so it is not practical to make it much smaller or scan times become long and power-drop influences become larger.

The robot positioning system specification for the repeatability of the positioning (**dss** in EN50361:2001) is +/- 0.04mm.

2.1 SAR MEASUREMENT SYSTEM

2.1.3 SAR MEASUREMENT PROCEDURE

The phantom shell is made by an industrial moulding process from the CAD files of the SAM shape, with both internal and external moulds. For the upright phantoms, the external shape is subsequently digitised on a Mitutoyo CMM machine (Euro C574) to a precision of 0.001mm. Wall thickness measurements made non-destructively with an ultrasonic sensor indicate that the shell thickness (**dph**) away from the ear is 2.0 +/- 0.1mm. The ultrasonic measurements were calibrated using additional mechanical measurements on available cut surfaces of the phantom shells.

For the upright phantom, the alignment is based upon registration of the rotation axis of the phantom on its 253mm-diameter baseplate bearing and the position of the probe axis when commanded to go to the axial position. A laser alignment tool is provided (procedure detailed elsewhere). This enables the registration of the phantom tip (**dmis**) to be assured to within approx. 0.2mm. This alignment is done with reference to the actual probe tip after installation and probe alignment. The rotational positioning of the phantom is variable – offering advantages for special studies, but locating pins ensure accurate repositioning at the principal positions (LH and RH ears).

2.2 MAXIMUM W-CDMA FDD BAND 2 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 10:52:55	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0001.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.3°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	51.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	8.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-9.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	15.70 V/m
TEST FREQUENCY:	1888.0MHz	SAR 1g:	0.464 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.276 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.075 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.075 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	0.17 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

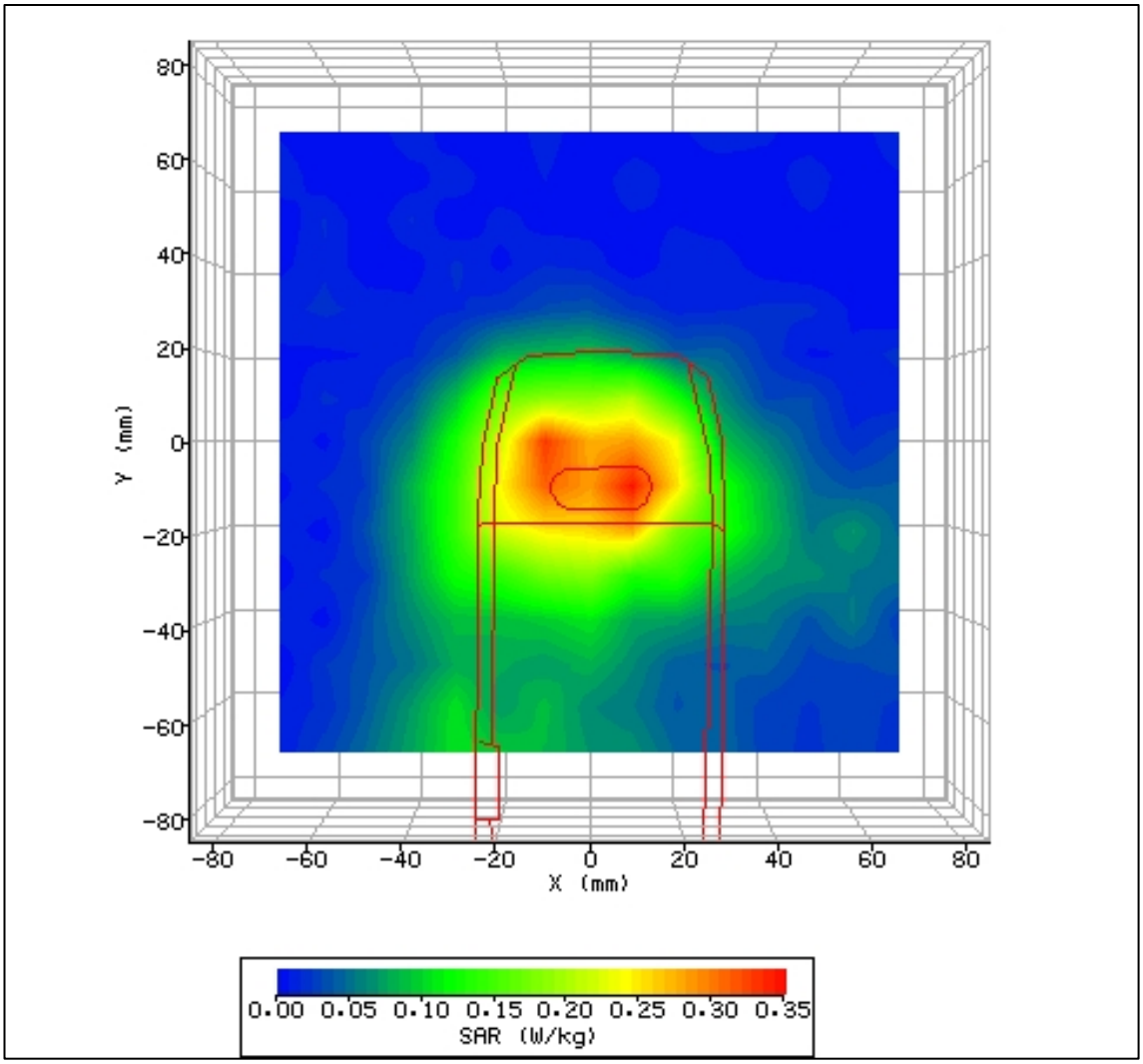

Figure 4: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1888.0MHz (W-CDMA FDD Band 2 Middle Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 2 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 11:17:20	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0002.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.4°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	59.6%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	5.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-7.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	15.28 V/m
TEST FREQUENCY:	1852.5MHz	SAR 1g:	0.439 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.279 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.083 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.084 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	1.19 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

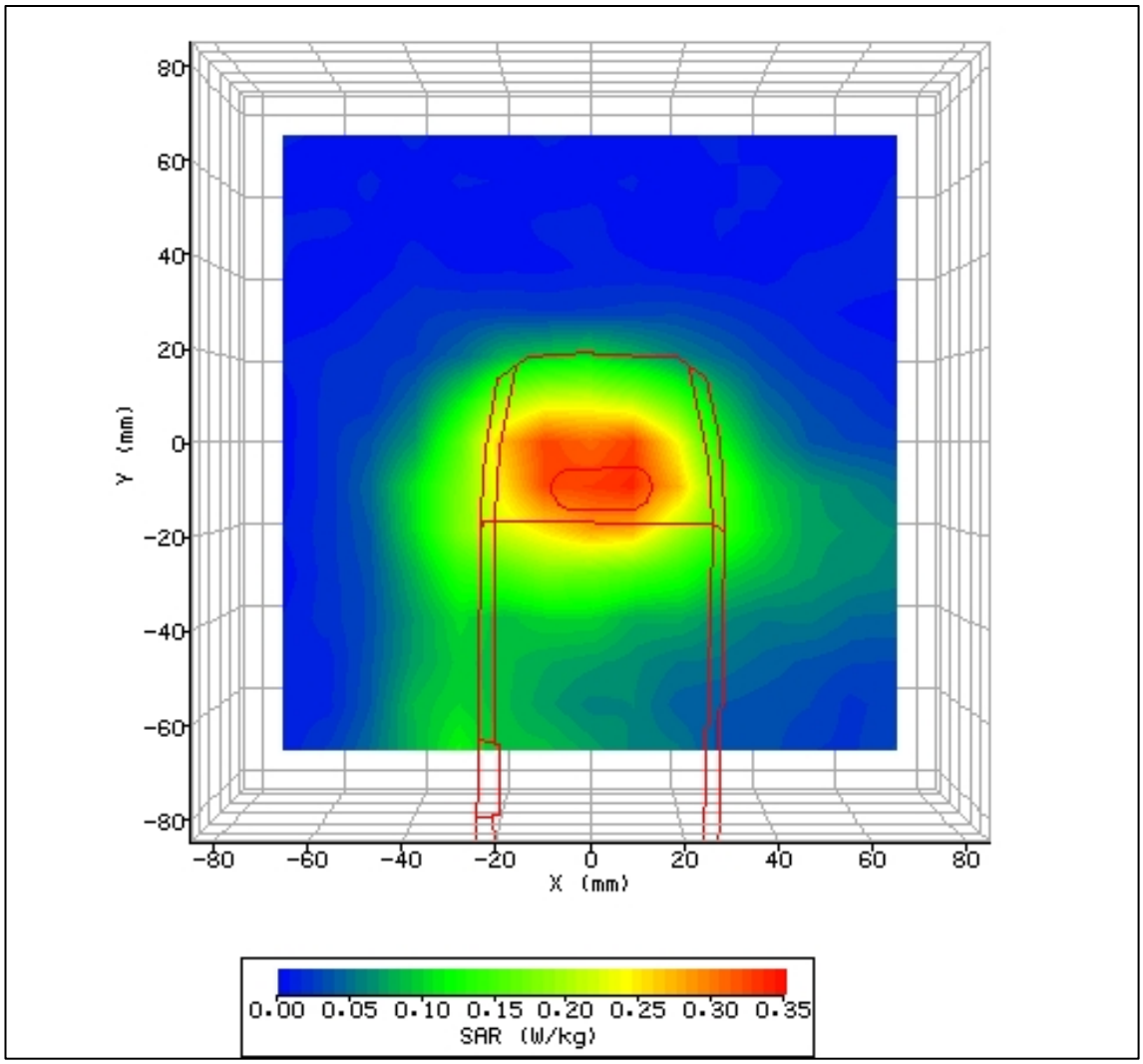

Figure 5: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1852.5MHz (W-CDMA FDD Band 2 Bottom Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 2 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 11:45:29	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0003.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.4°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	64.1%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-8.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	14.51 V/m
TEST FREQUENCY:	1907.6MHz	SAR 1g:	0.401 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.253 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.075 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.069 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-7.30 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

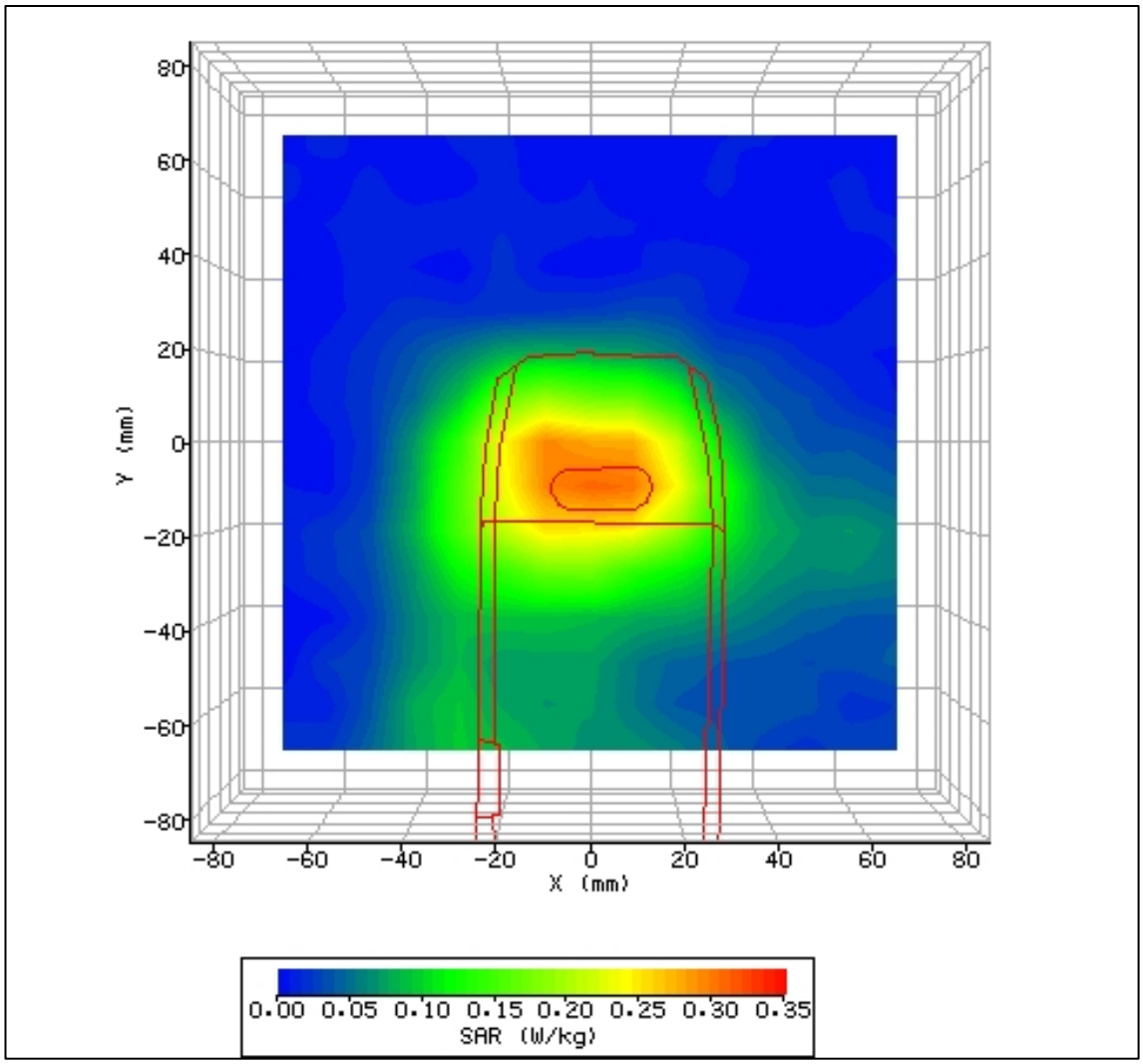

Figure 6: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1907.6MHz (W-CDMA FDD Band 2 Top Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 2 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 14:05:33	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0004.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.1°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	61.5%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	8.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-11.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	14.06 V/m
TEST FREQUENCY:	1888.0MHz	SAR 1g:	0.359 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.224 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.069 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.065 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-6.15 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

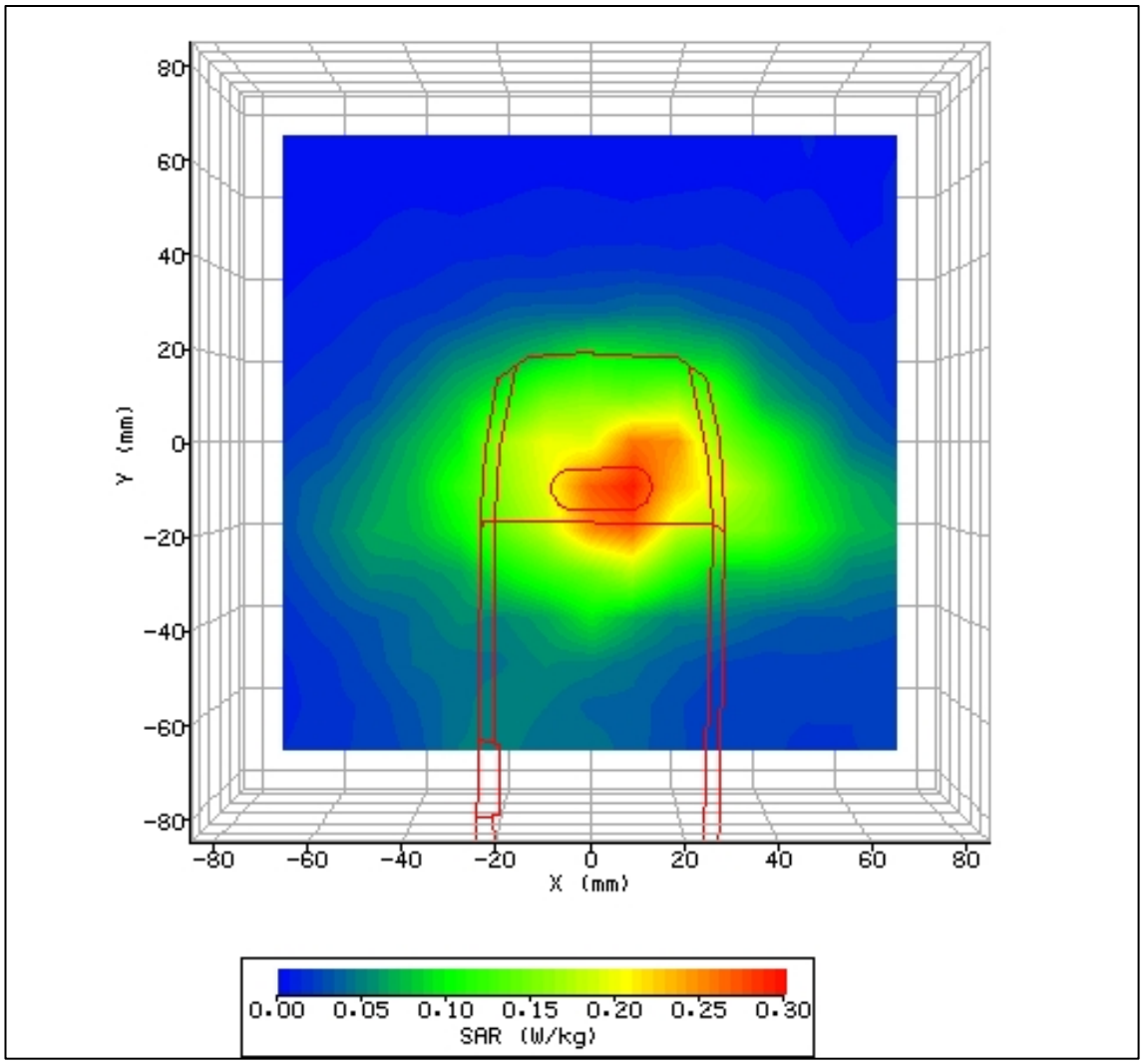

Figure 7: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1888.0MHz (W-CDMA FDD Band 2 Middle Channel) with 18mm Separation – Host 2 used

2.2 MAXIMUM W-CDMA FDD BAND 2 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 14:44:34	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0005.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.9°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	62.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	20.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-17.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	12.91 V/m
TEST FREQUENCY:	1888.0MHz	SAR 1g:	0.304 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.174 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.054 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.052 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-2.92 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

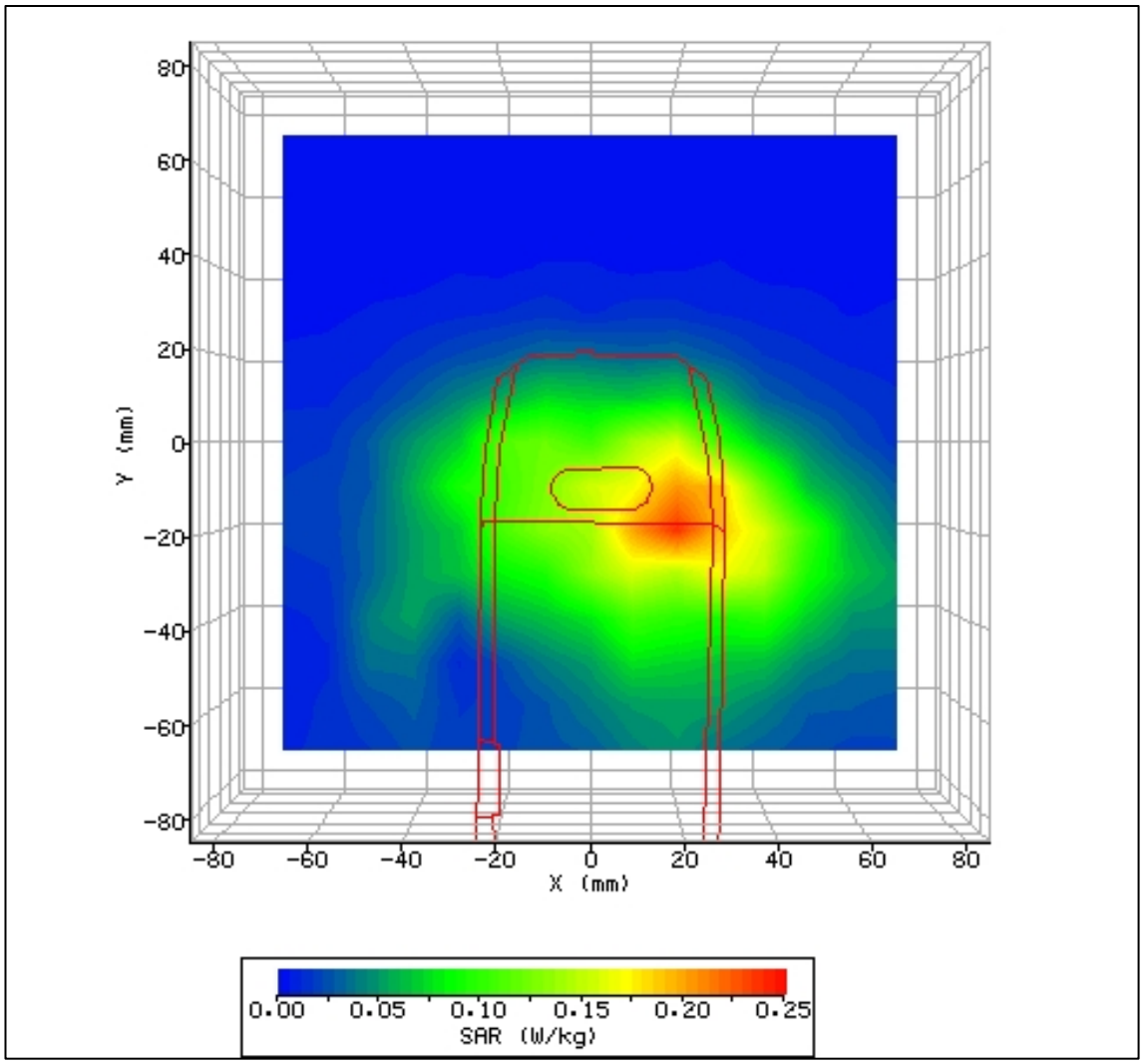

Figure 8: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1888.0MHz (W-CDMA FDD Band 2 Middle Channel) with 14mm Separation – Host 3 used

2.2 MAXIMUM W-CDMA FDD BAND 5 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 17:24:46	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0006.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.5°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	48.7%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	3.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	11.30 V/m
TEST FREQUENCY:	836.6MHz	SAR 1g:	0.159 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.100 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.035 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.035 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	0.00 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

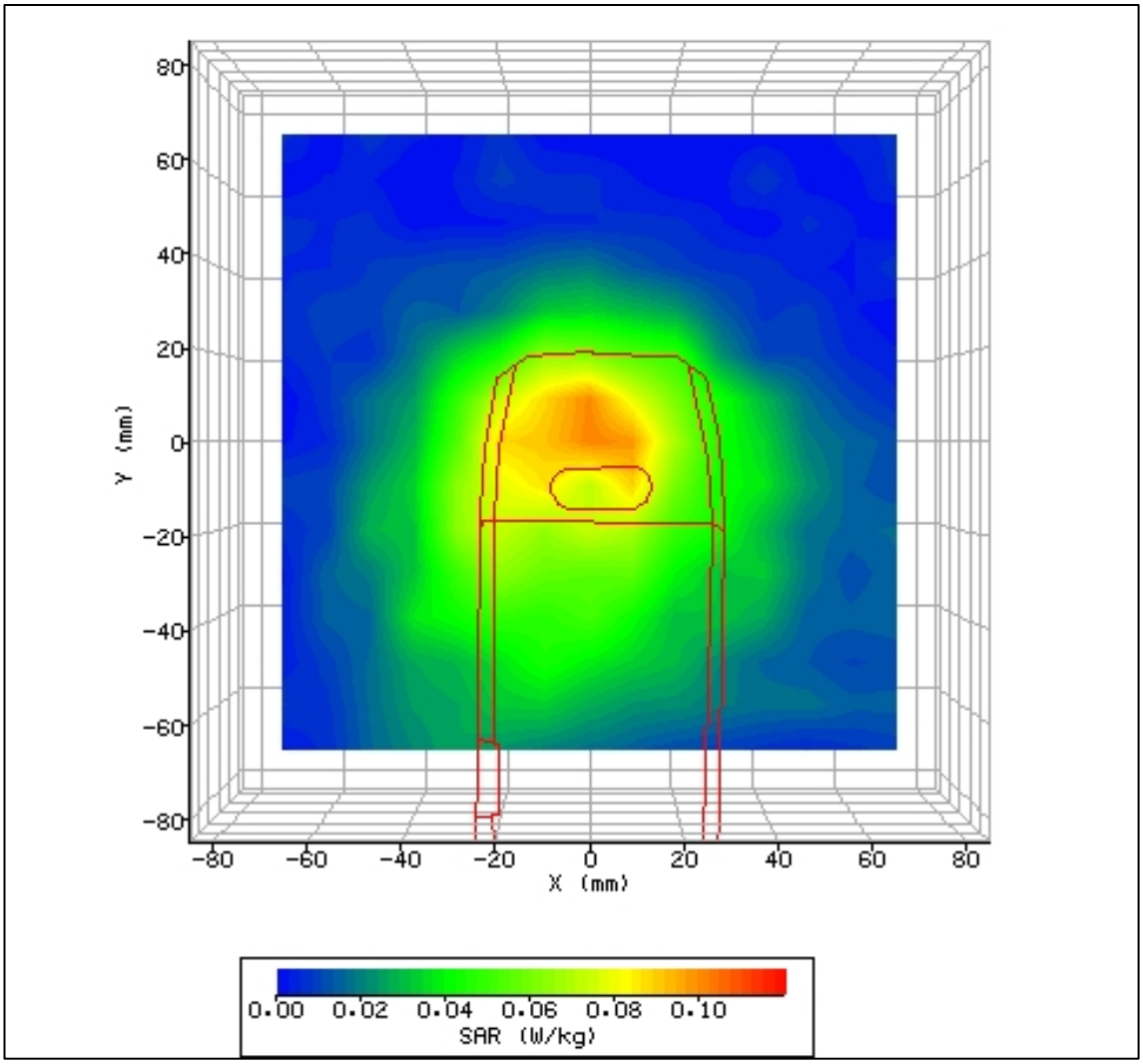

Figure 9: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 836.6MHz (W-CDMA FDD Band 5 Middle Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 5 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 18:10:26	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0007.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.9°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	54.6%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	2.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	9.52 V/m
TEST FREQUENCY:	826.4MHz	SAR 1g:	0.107 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.072 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.026 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.027 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	3.70 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

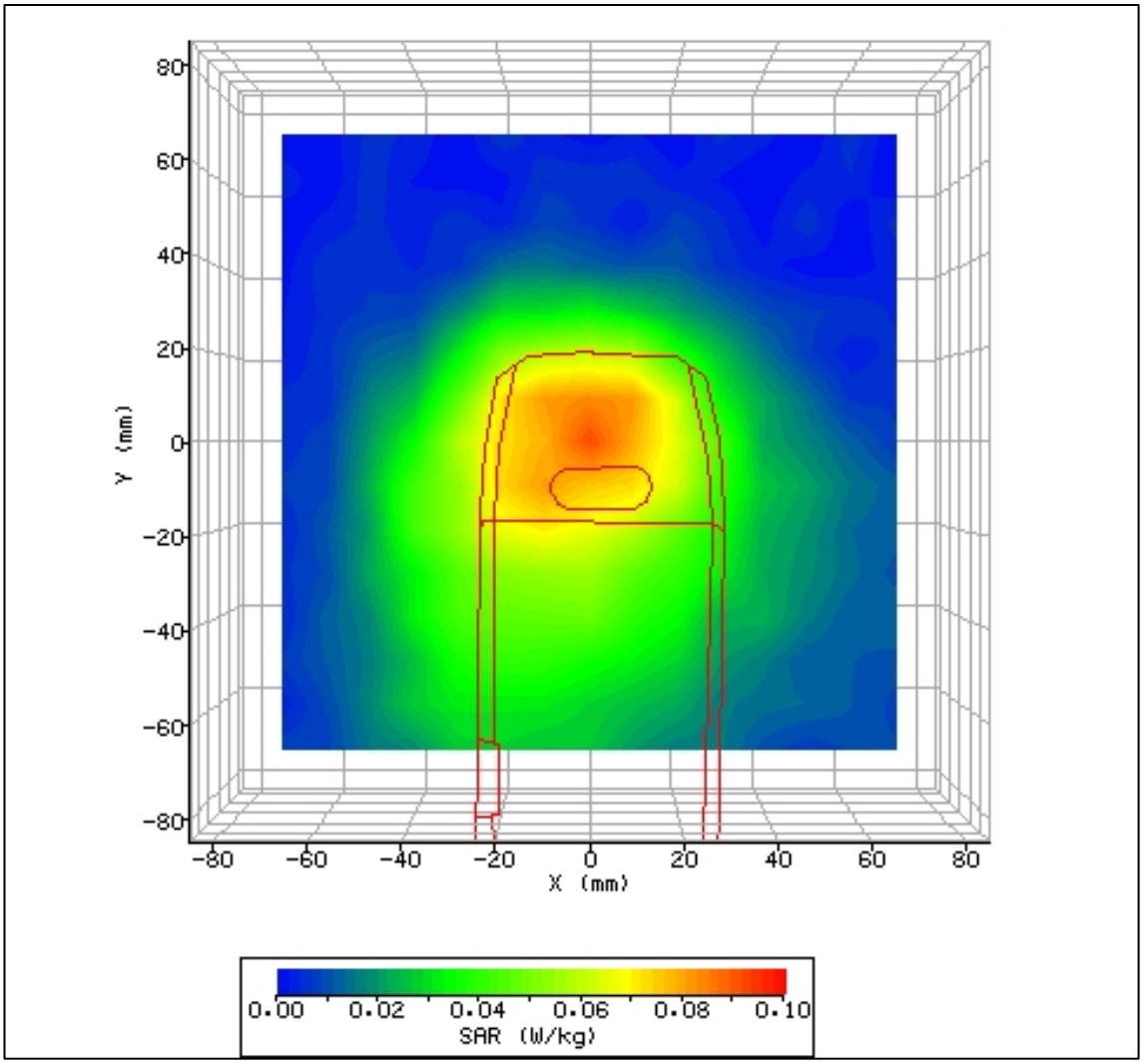

Figure 10: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 826.4MHz (W-CDMA FDD Band 5 Bottom Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 5 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 18:33:39	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0008.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.4°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	55.4%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.5°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-5.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	1.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	12.35 V/m
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.171 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.119 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.046 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.045 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-1.38 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

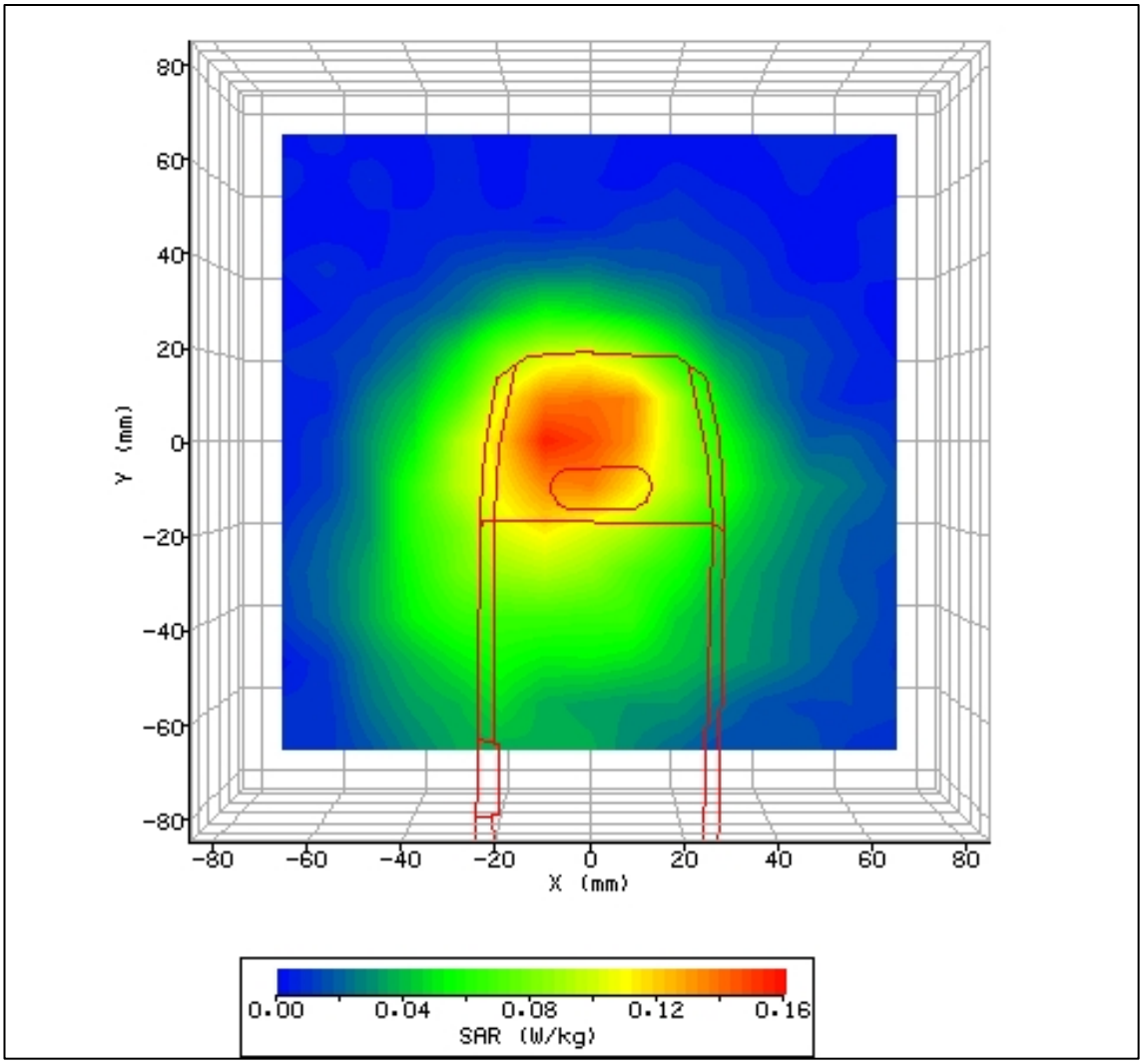

Figure 11: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 846.6MHz (W-CDMA FDD Band 5 Top Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 5 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 22:11:04	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0009.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.7°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	52.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-2.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	18.75 V/m
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.415 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.262 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.102 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.094 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-7.55 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

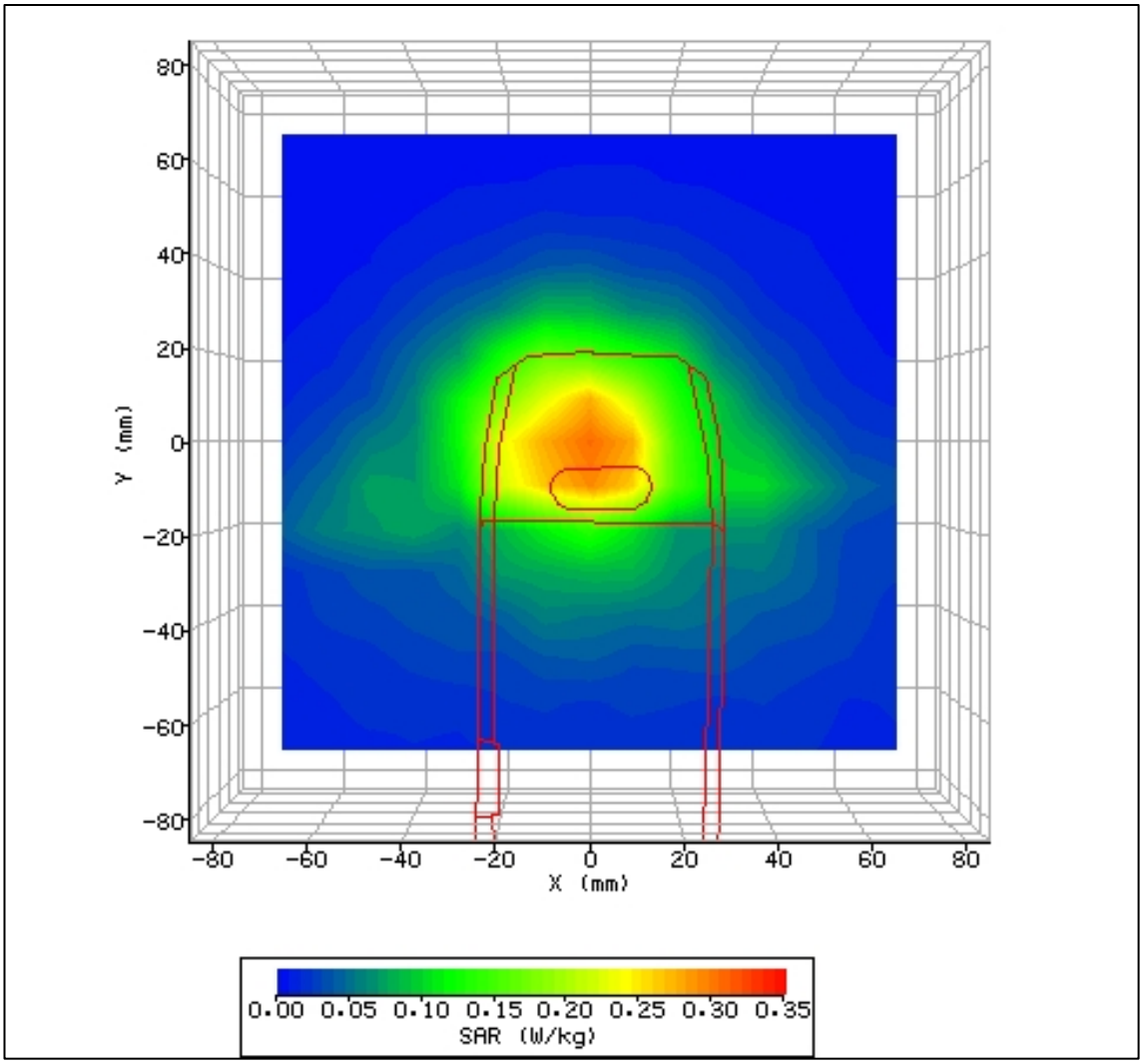

Figure 12: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 846.6MHz (W-CDMA FDD Band 5 Top Channel) with 18mm Separation – Host 2 used

2.2 MAXIMUM W-CDMA FDD BAND 5 HSDPA TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 21:41:02	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0010.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.8°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	54.6%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-8.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-12.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	14.95 V/m
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.267 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.182 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.068 W/kg
TYPE OF MODULATION:	16QAM	SAR END:	0.070 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	3.44 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

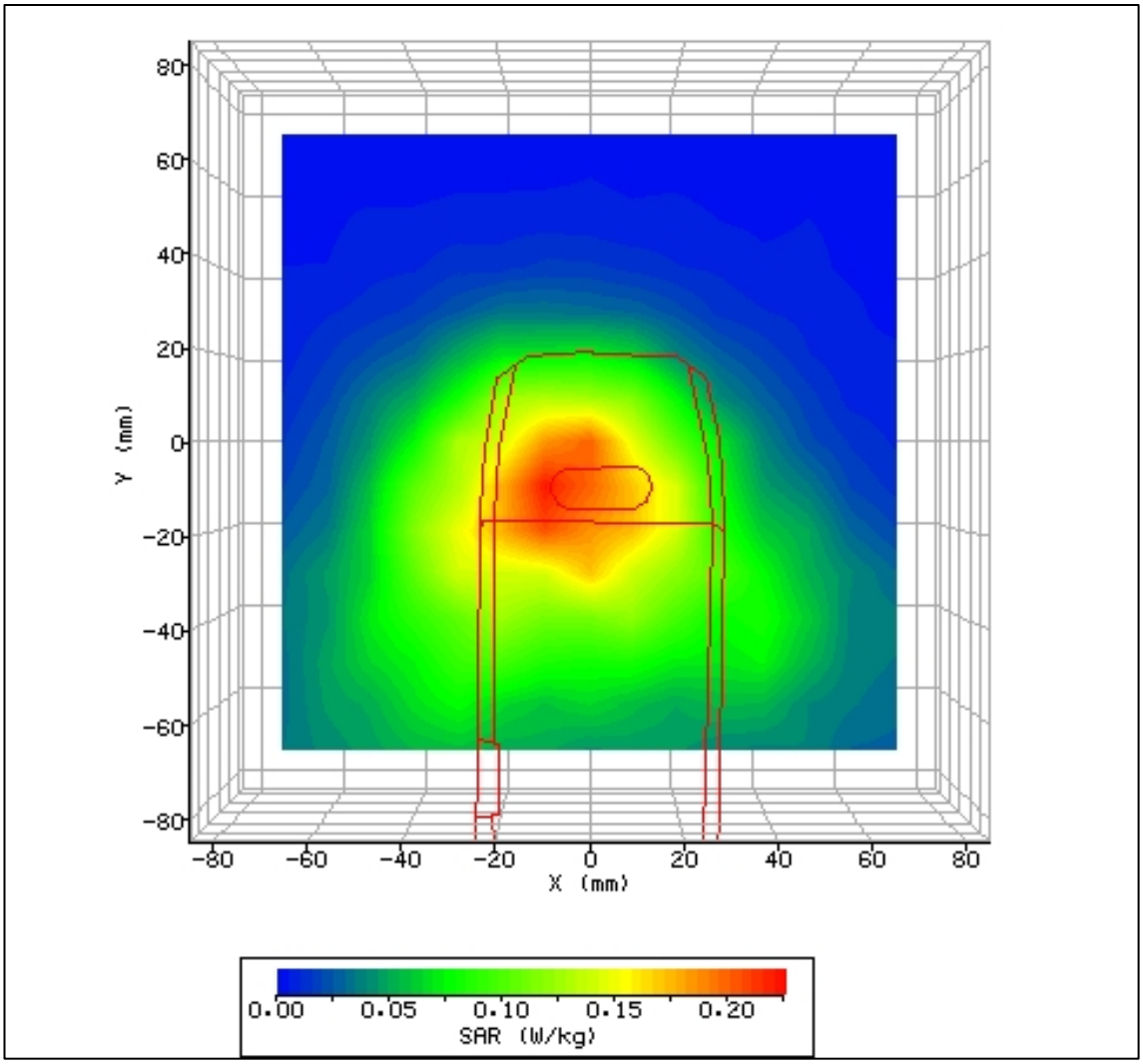

Figure 13: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 846.6MHz (W-CDMA FDD Band 5 Top Channel) with 14mm Separation – Host 3 used

2.2 MAXIMUM W-CDMA FDD BAND 2 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 12:15:22	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0011.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	23.3°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	57.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.2°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	7.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-4.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	17.08 V/m
TEST FREQUENCY:	1888.0MHz	SAR 1g:	0.549 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.351 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.103 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.103 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-0.25 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

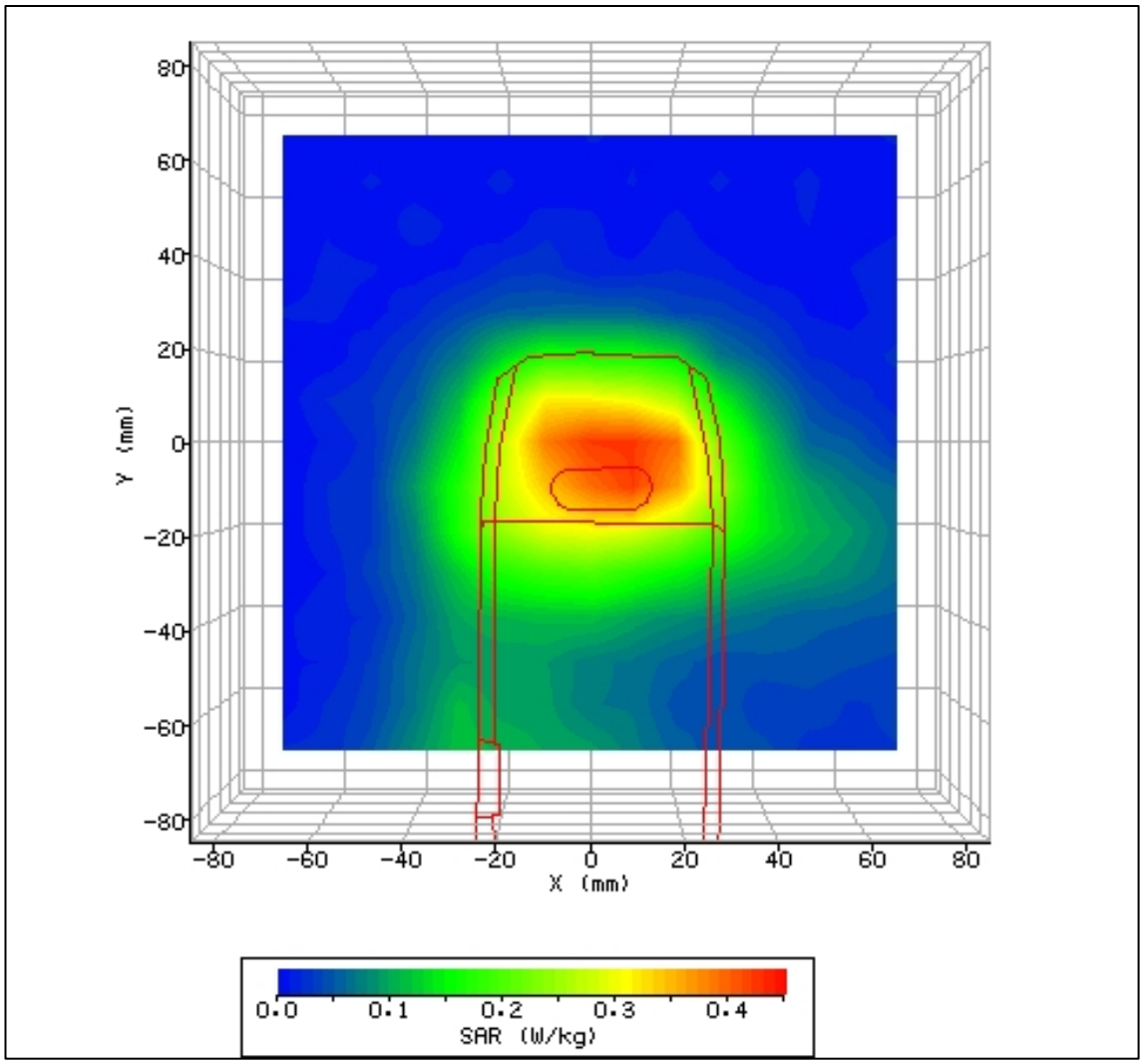

Figure 14: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1888.0MHz (W-CDMA FDD Band 2 Middle Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 2 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 12:38:54	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0012.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.9°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	54.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.2°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	8.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-4.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	17.27 V/m
TEST FREQUENCY:	1852.5MHz	SAR 1g:	0.551 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.349 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.103 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.102 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-1.37 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

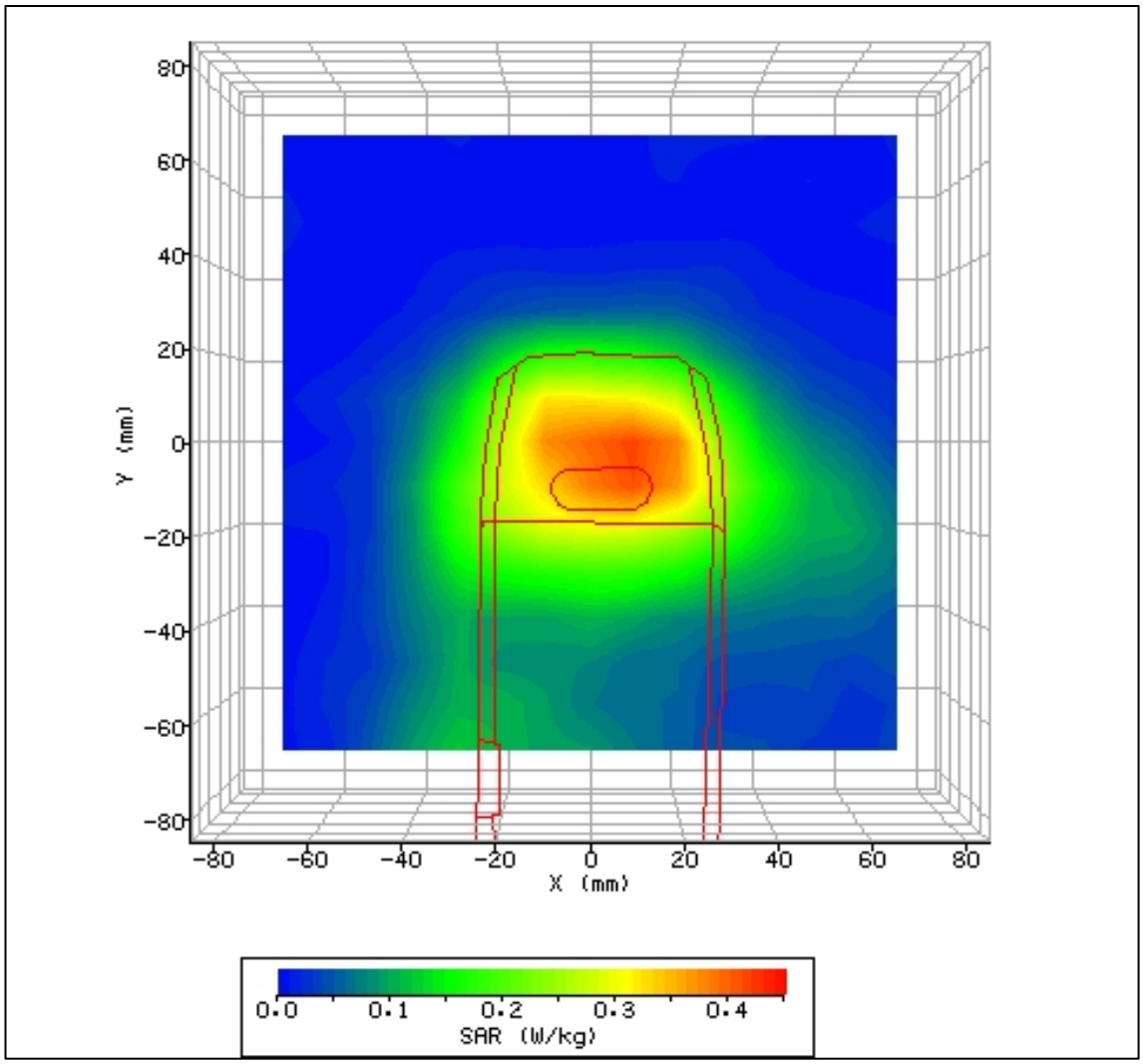

Figure 15: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1852.5MHz (W-CDMA FDD Band 2 Bottom Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 2 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 13:03:23	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0013.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.6°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	52.1%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.2°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	9.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-4.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	16.41 V/m
TEST FREQUENCY:	1907.6MHz	SAR 1g:	0.496 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.316 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.093 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.093 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-0.30 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

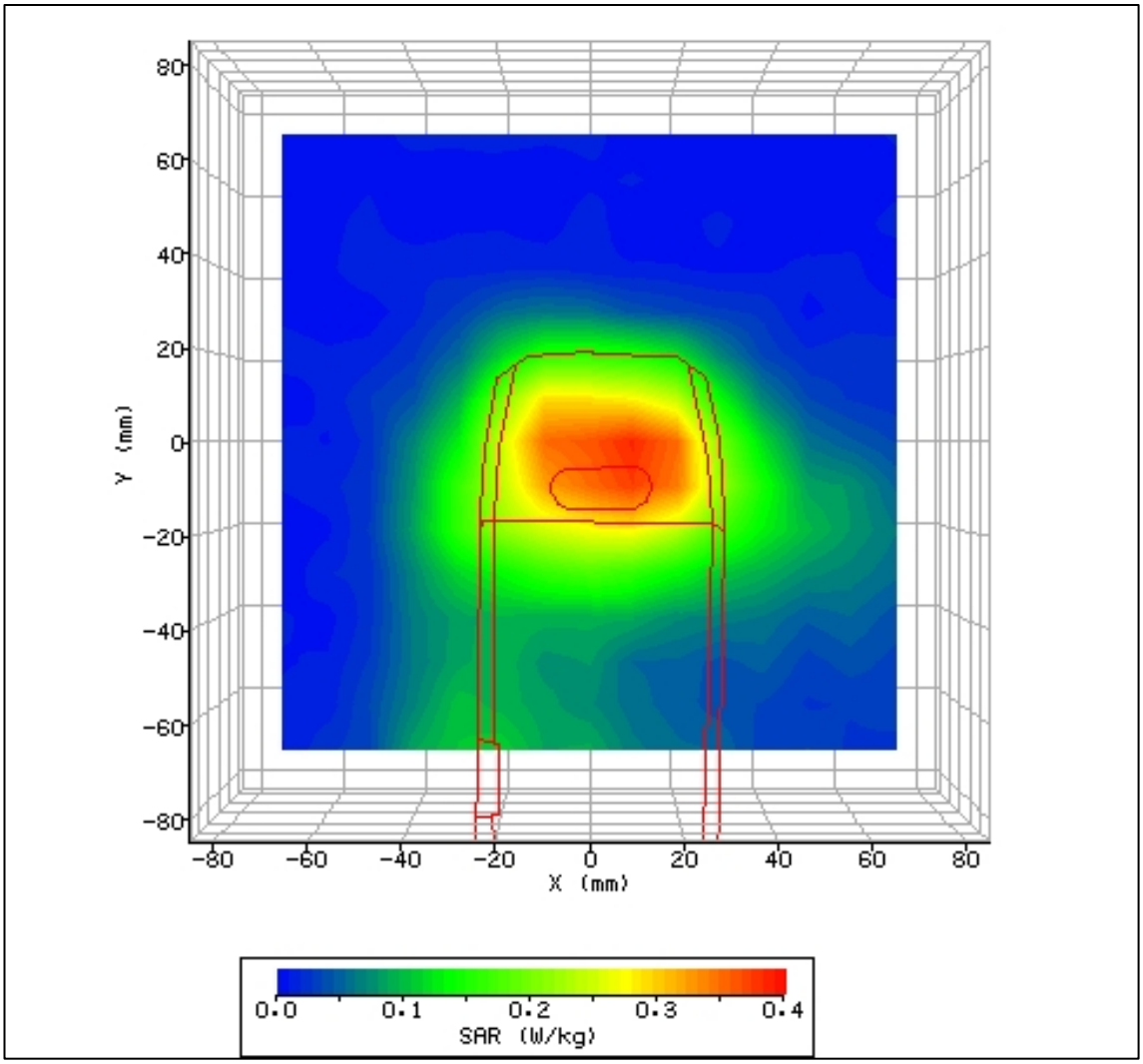

Figure 16: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1907.6MHz (W-CDMA FDD Band 2 Top Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 2 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 13:38:43	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0014.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.1°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	56.4%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	9.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-9.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	14.35 V/m
TEST FREQUENCY:	1852.5MHz	SAR 1g:	0.387 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.251 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.079 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.079 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-0.02 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

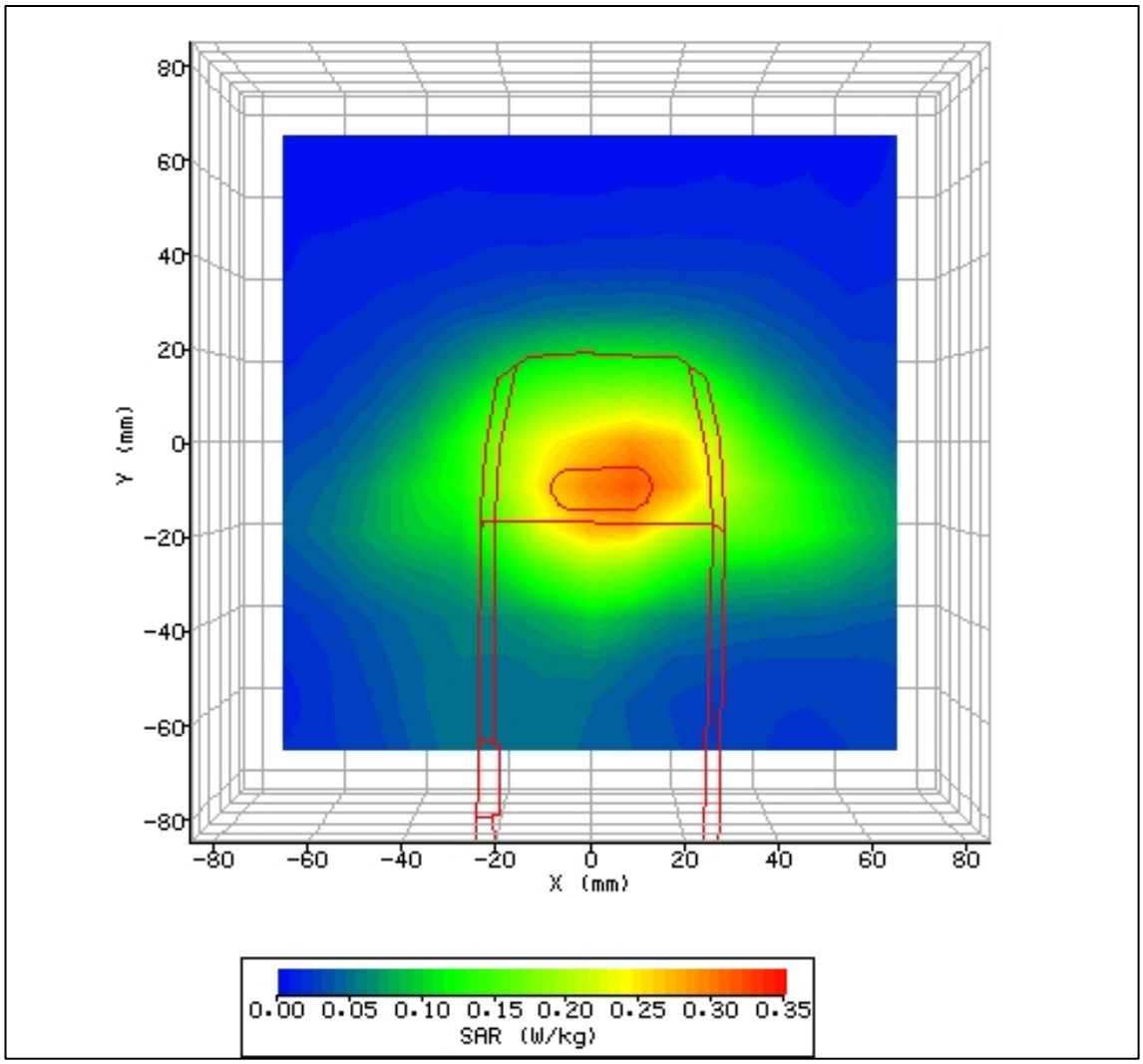

Figure 17: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1852.5MHz (W-CDMA FDD Band 2 Bottom Channel) with 18mm Separation – Host 2 used

2.2 MAXIMUM W-CDMA FDD BAND 2 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	29/10/2005 15:10:51	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0015.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.4°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	54.6%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	19.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-15.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	15.37 V/m
TEST FREQUENCY:	1852.5MHz	SAR 1g:	0.429 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.267 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.084 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.083 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-1.33 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	29/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

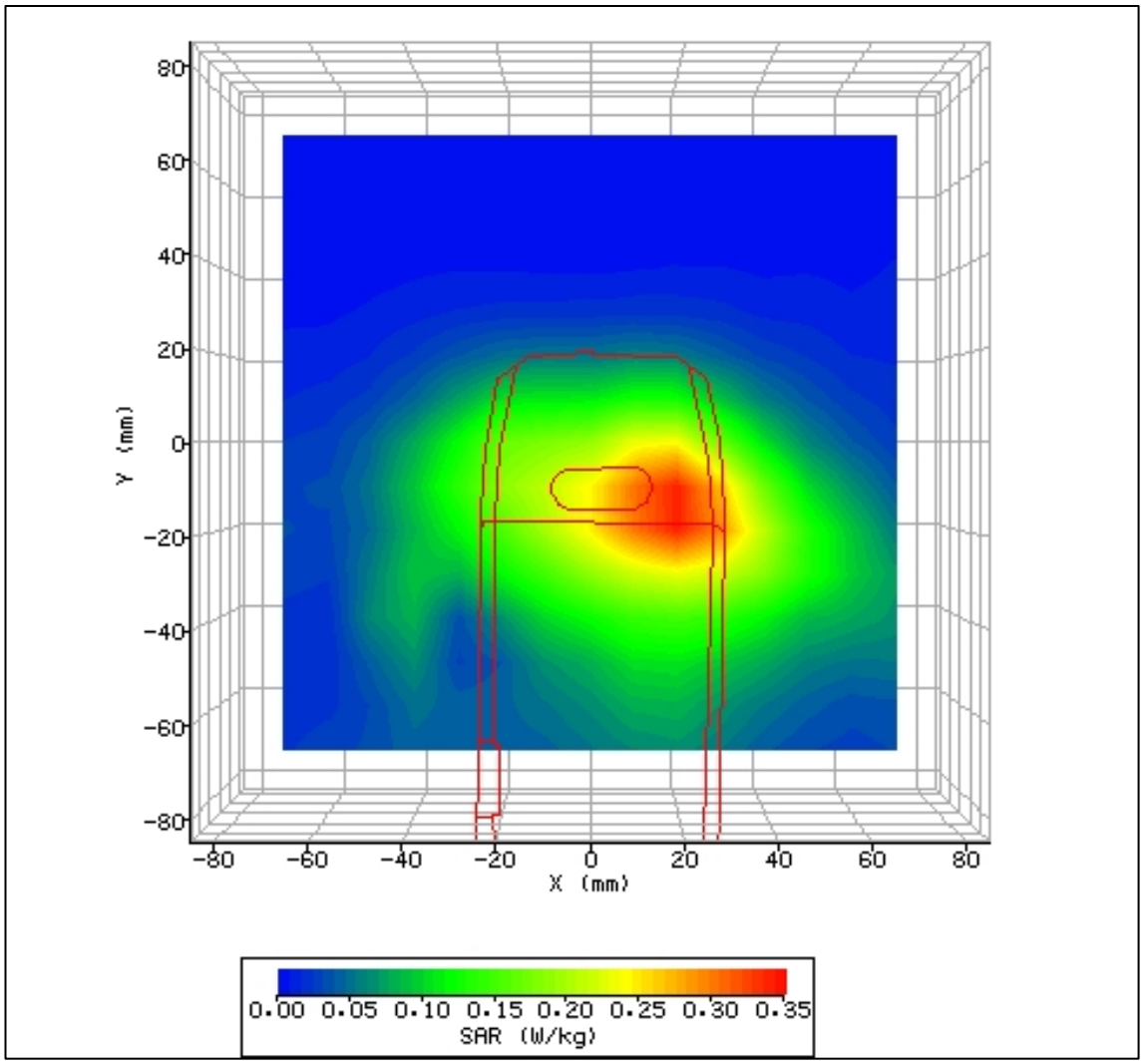

Figure 18: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1852.5MHz (W-CDMA FDD Band 2 Bottom Channel) with 14mm Separation – Host 3 used

2.2 MAXIMUM W-CDMA FDD BAND 5 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 19:07:58	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0016.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.4°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	54.2%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-1.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-2.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	10.42 V/m
TEST FREQUENCY:	836.6MHz	SAR 1g:	0.128 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.090 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.036 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.036 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	2.20 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

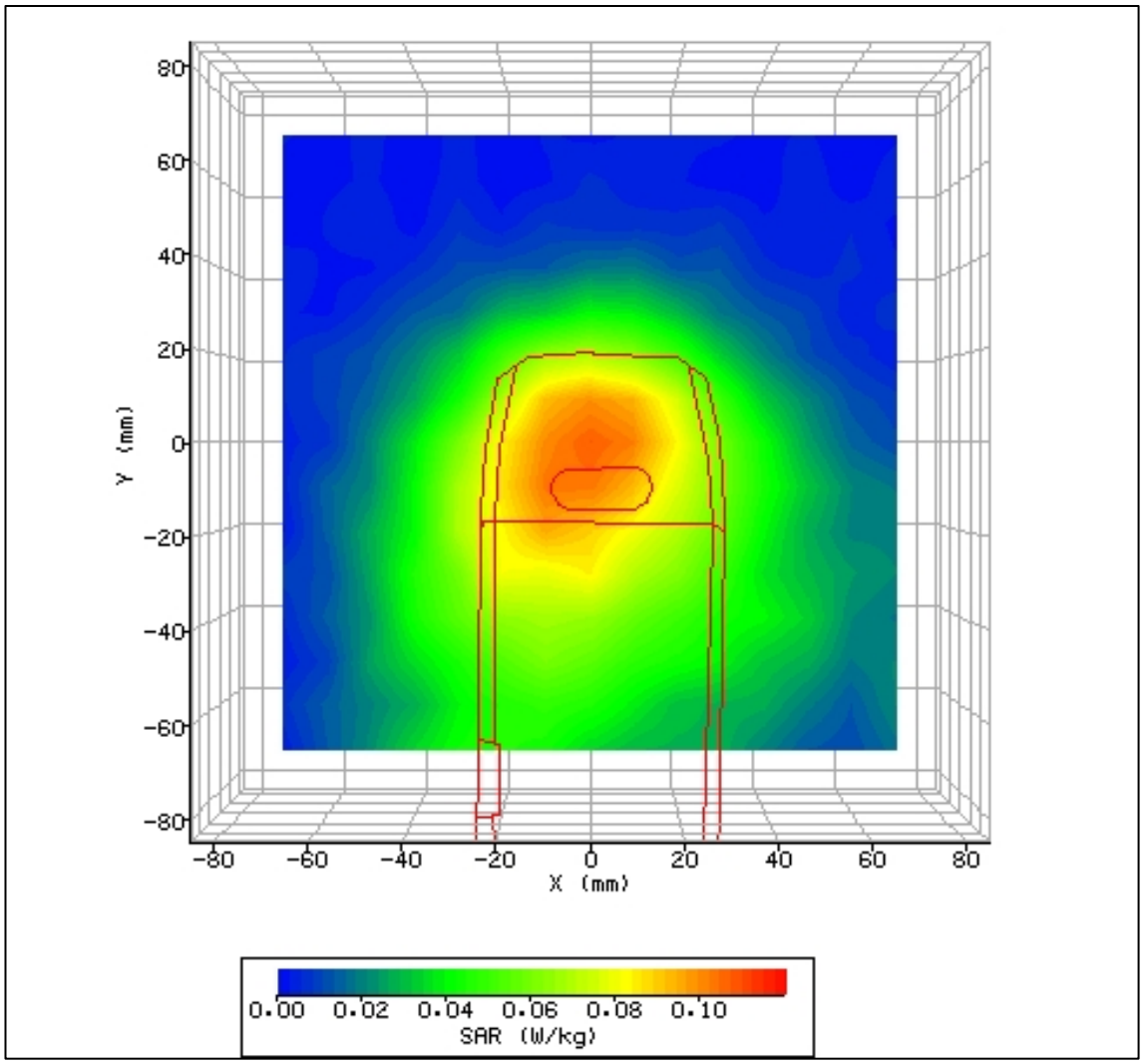

Figure 19: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 836.6MHz (W-CDMA FDD Band 5 Middle Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 5 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 19:38:27	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0017.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.8°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	51.2%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-3.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	0.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	12.24 V/m
TEST FREQUENCY:	826.4MHz	SAR 1g:	0.173 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.122 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.047 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.047 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-0.45 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

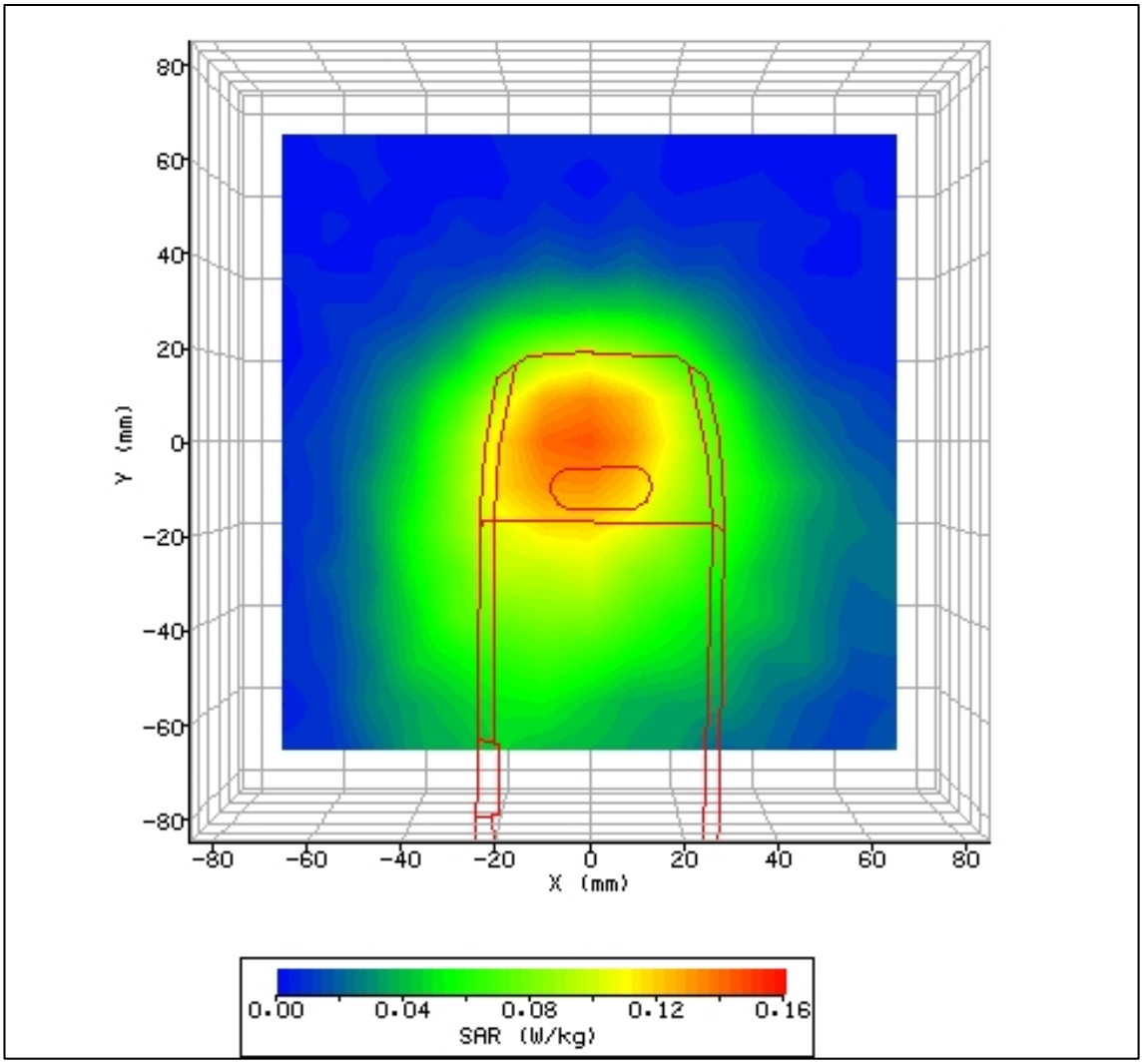

Figure 20: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 826.4MHz (W-CDMA FDD Band 5 Bottom Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 5 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 20:03:12	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0018.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.9°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	56.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-2.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	1.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	13.59 V/m
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.222 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.151 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.056 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.059 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	6.39 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

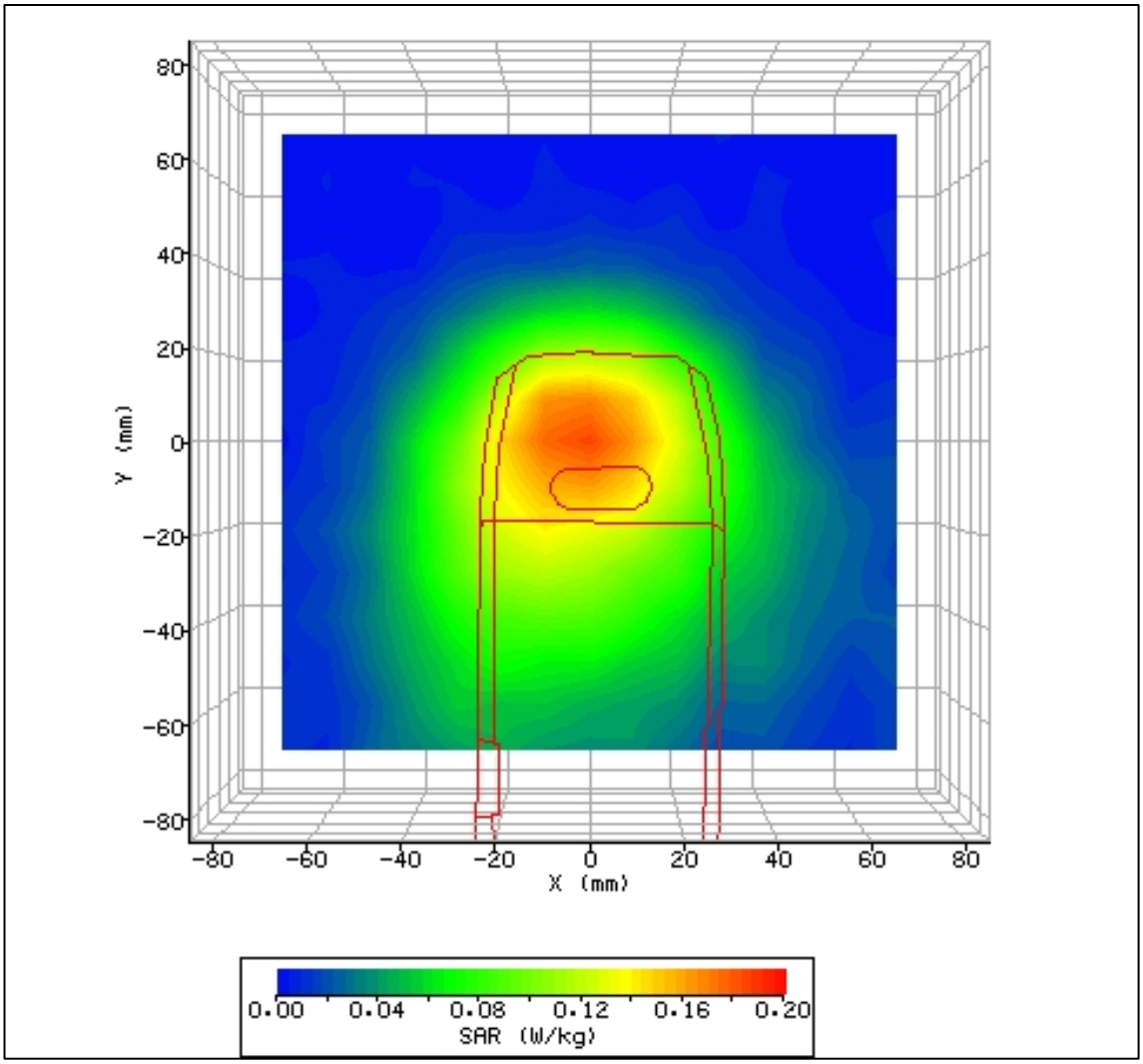

Figure 21: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 846.6MHz (W-CDMA FDD Band 5 Top Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM W-CDMA FDD BAND 5 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 20:35:48	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0019.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.5°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	54.3%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	6.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	17.34 V/m
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.347 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.231 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.096 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.094 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	-1.66 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

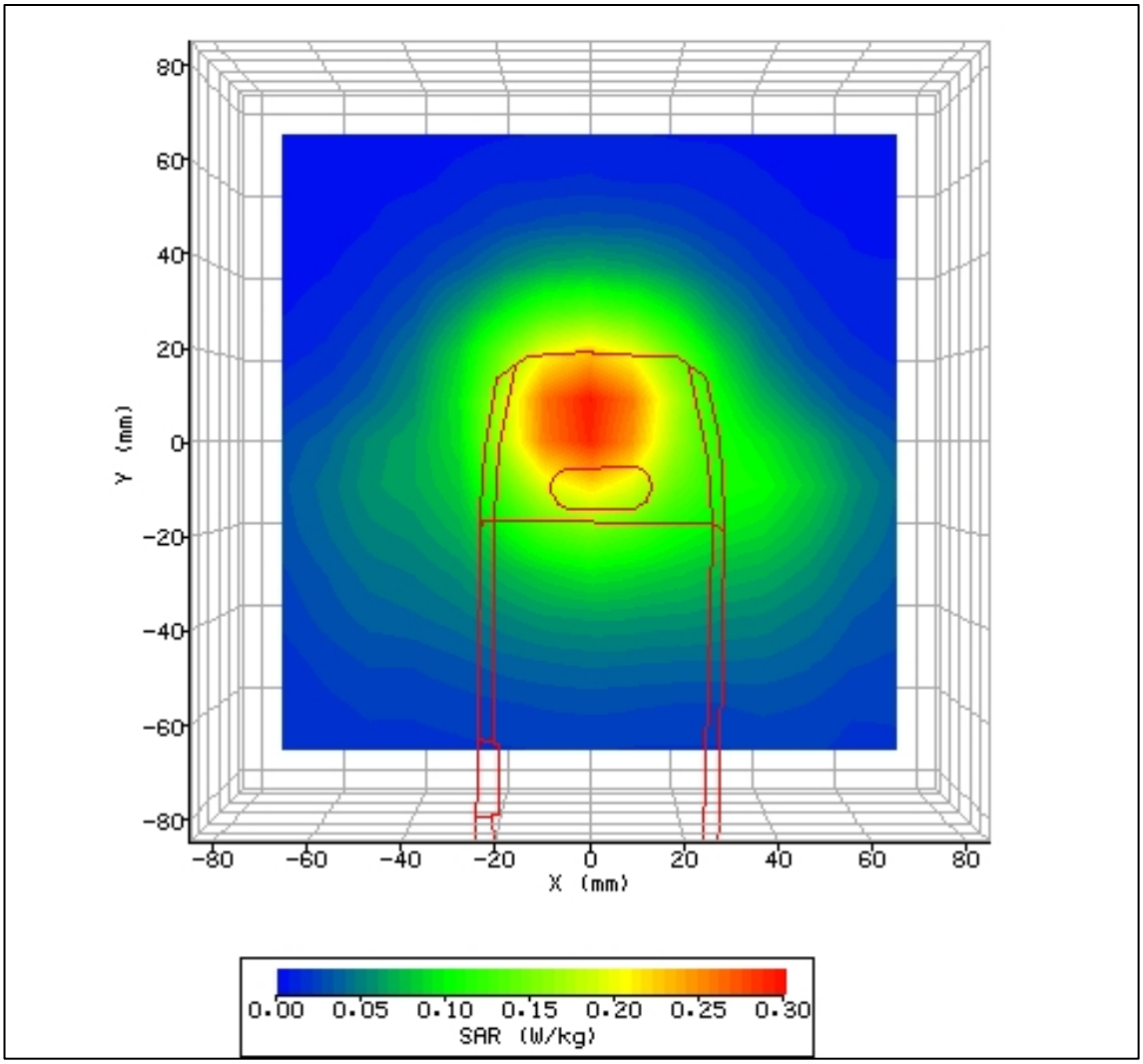

Figure 22: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 846.6MHz (W-CDMA FDD Band 5 Top Channel) with 18mm Separation – Host 2 used

2.2 MAXIMUM W-CDMA FDD BAND 5 RMC TEST MODE SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 21:12:48	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0020.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.5°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	56.9%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-3.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-11.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	17.28 V/m
TEST FREQUENCY:	846.6MHz	SAR 1g:	0.356 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.248 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.099 W/kg
TYPE OF MODULATION:	QPSK	SAR END:	0.099 W/kg
MODN. DUTY CYCLE:	100%	SAR DRIFT DURING SCAN:	0.14 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

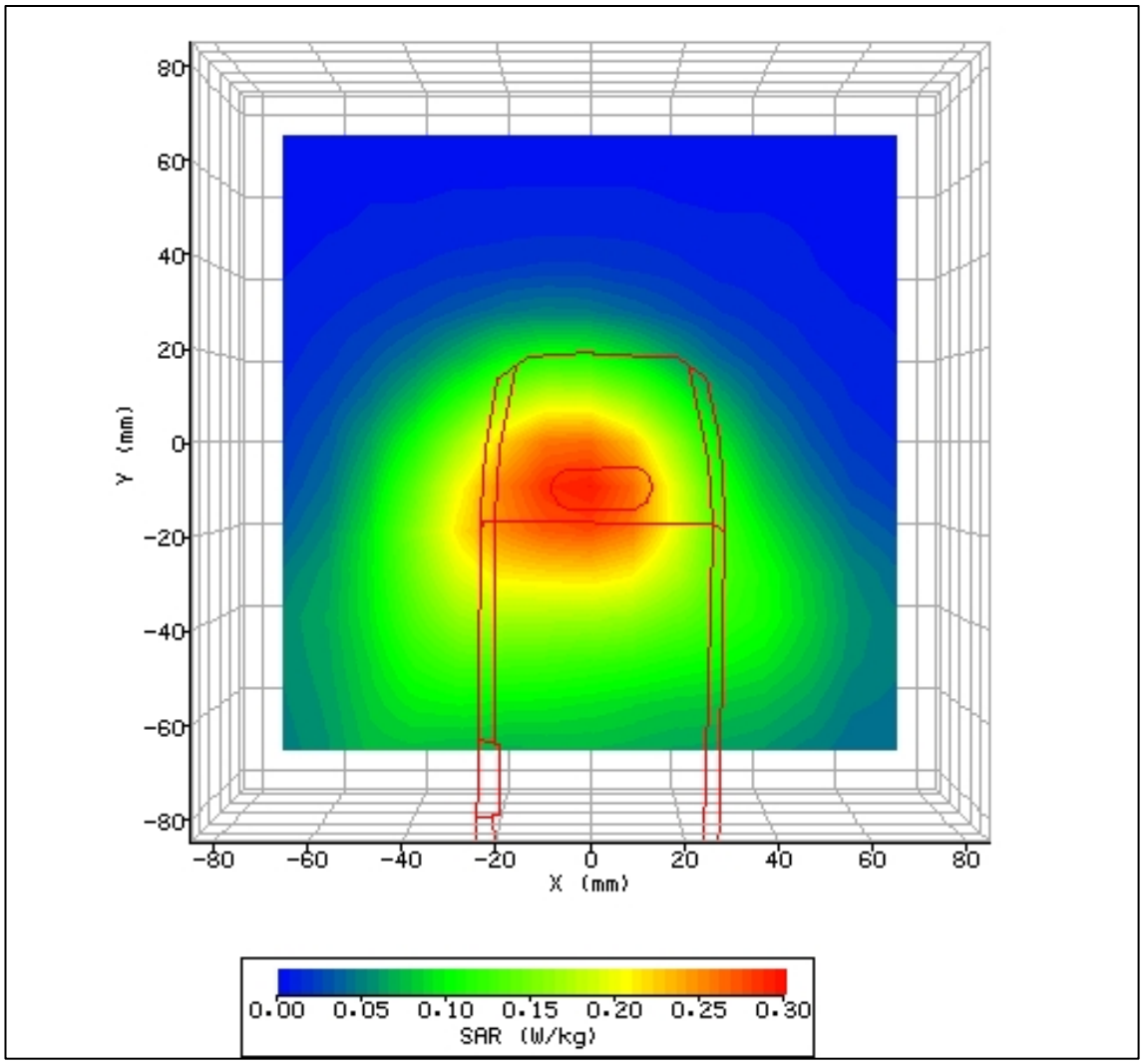

Figure 23: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 846.6MHz (W-CDMA FDD Band 5 Top Channel) with 14mm Separation – Host 3 used

2.2 MAXIMUM 1900 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	27/10/2005 20:51:23	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0021.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.0°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	66.7%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.2°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	8.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-14.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	23.75 V/m
TEST FREQUENCY:	1880.0MHz	SAR 1g:	1.035 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.639 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.187 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.192 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	2.22 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

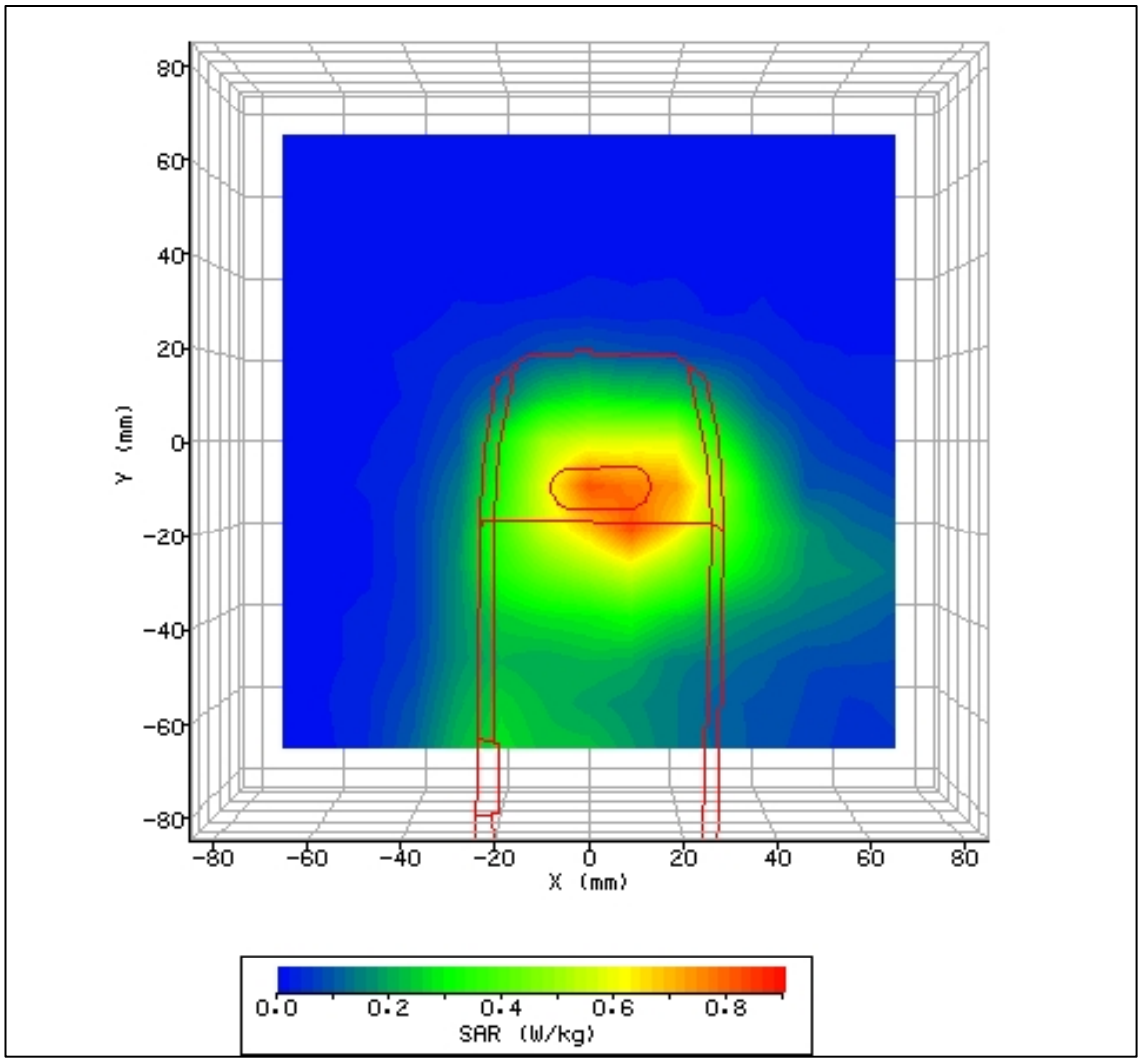

Figure 24: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1880.0MHz (1900 GPRS Middle Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM 1900 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	27/10/2005 21:14:40	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0022.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.1°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	61.2%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.2°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	13.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-13.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	22.86 V/m
TEST FREQUENCY:	1850.2MHz	SAR 1g:	0.971 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.602 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.181 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.172 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	-4.65 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

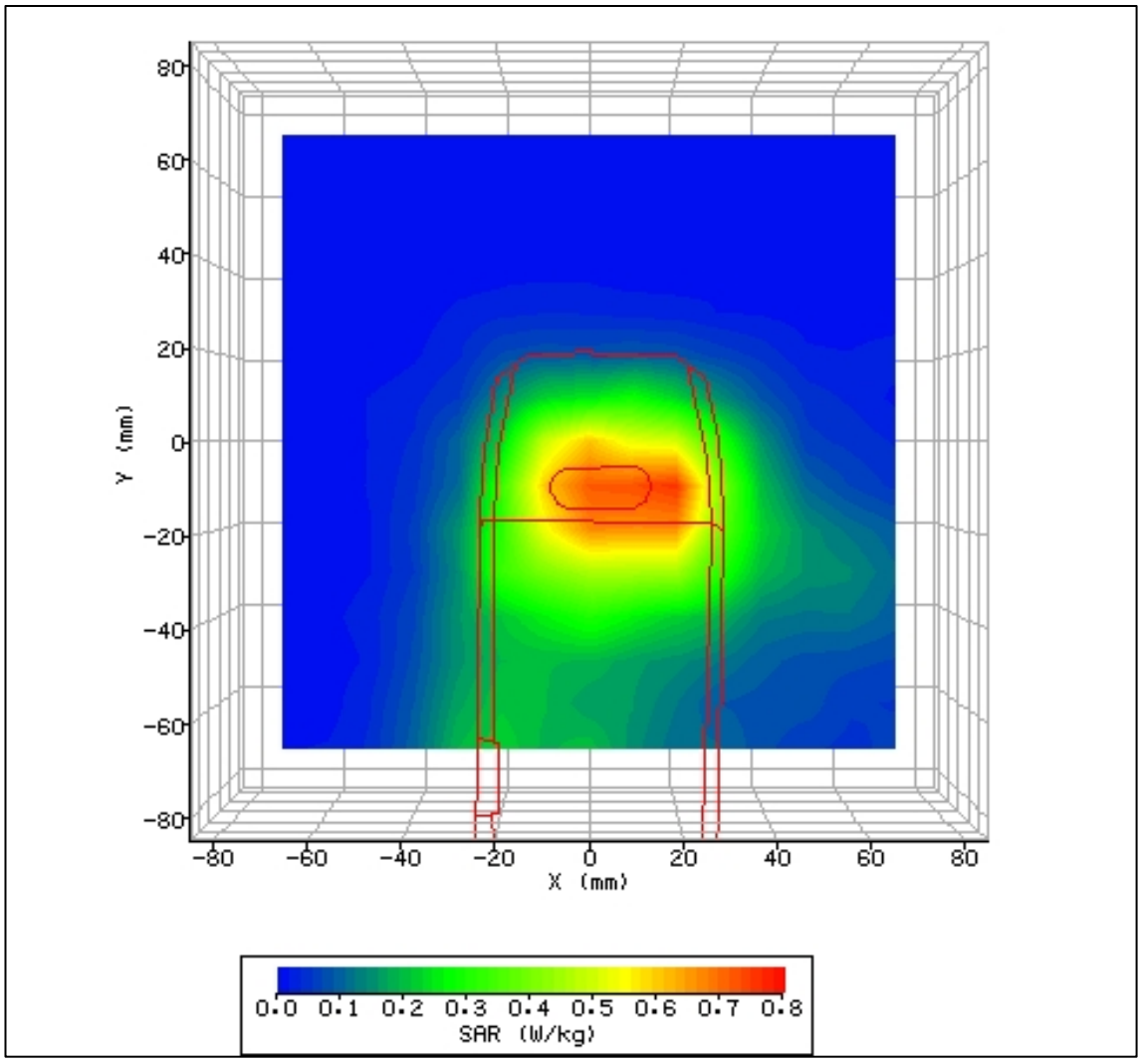

Figure 25: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1850.2MHz (1900 GPRS Bottom Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM 1900 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	27/10/2005 21:38:30	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0023.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.5°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	56.5%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.2°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	8.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-13.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	23.16 V/m
TEST FREQUENCY:	1909.8MHz	SAR 1g:	0.985 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.610 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.177 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.178 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	0.24 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	Poly4

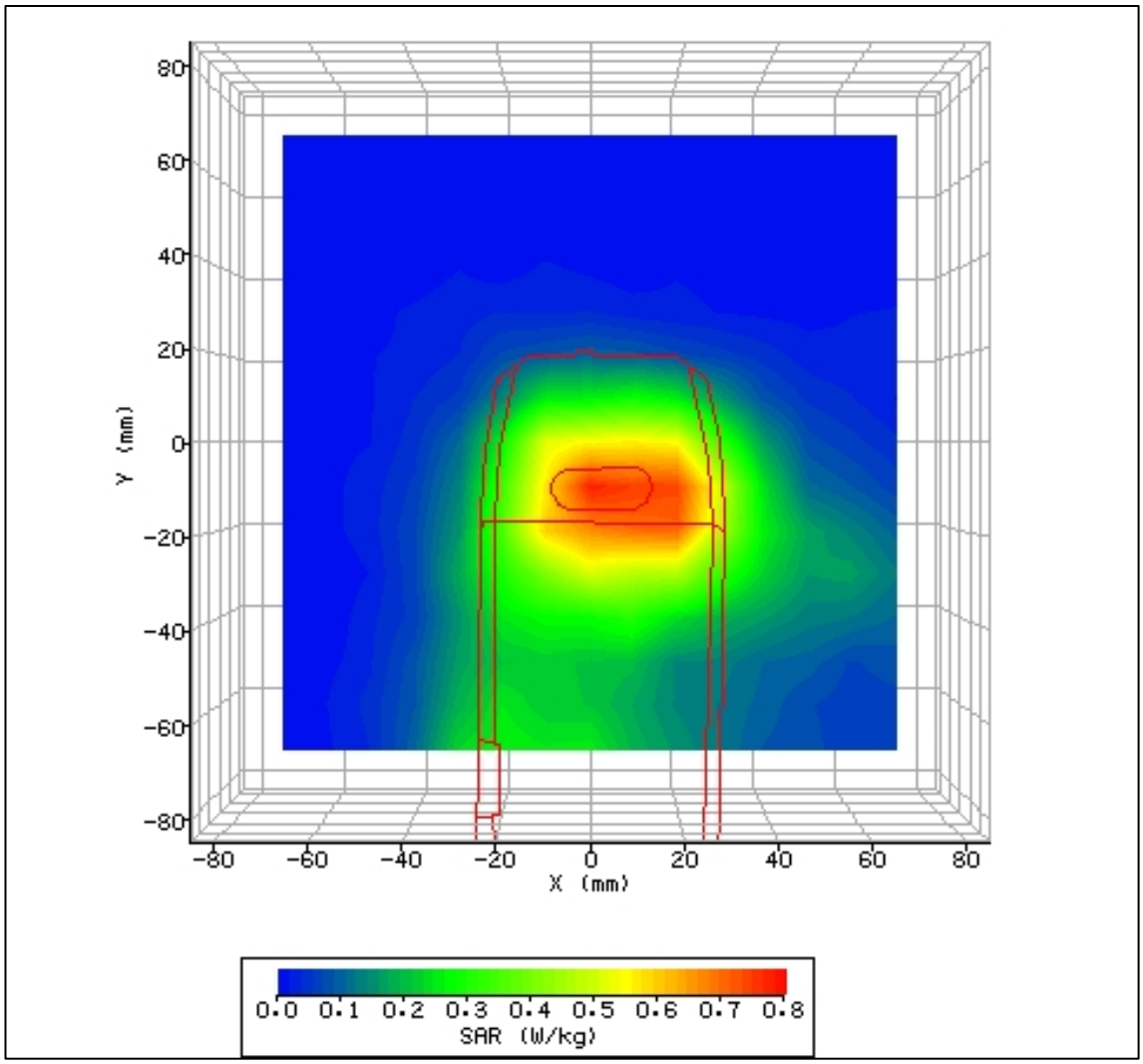

Figure 26: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1909.8MHz (1900 GPRS Top Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM 1900 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 10:33:48	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0024.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.1°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	45.1%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	13.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-8.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	19.25 V/m
TEST FREQUENCY:	1880.0MHz	SAR 1g:	0.683 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.422 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.118 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.116 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	-2.25 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

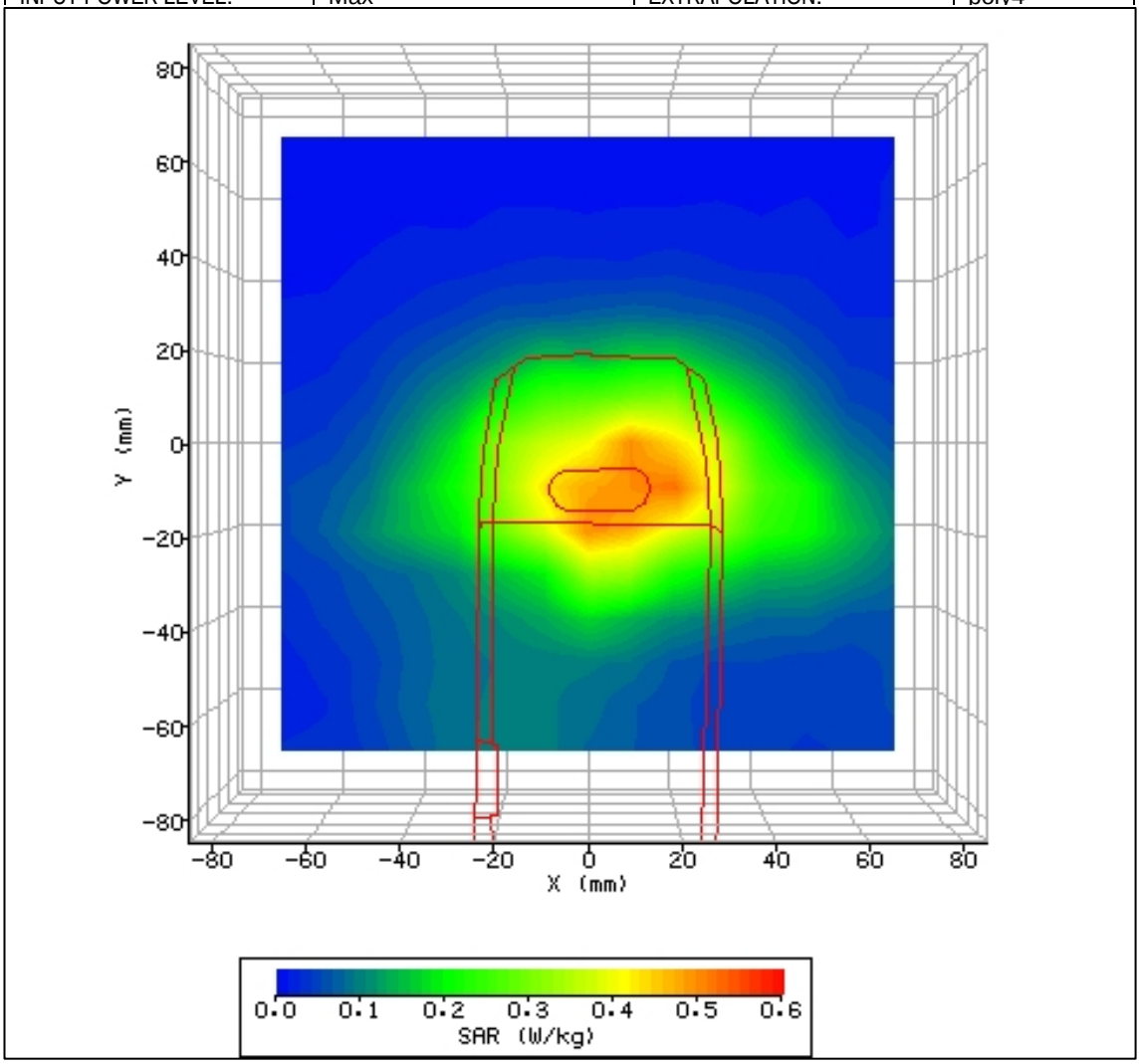

Figure27: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1880.0MHz (1900 GPRS Middle Channel) with 18mm Separation – Host 2 used

2.2 MAXIMUM 1900 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 09:56:38	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0025.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	23.1°C	LIQUID SIMULANT:	1900 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	53.98
RELATIVE HUMIDITY:	59.2%	CONDUCTIVITY:	1.506
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	19.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-15.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	18.72 V/m
TEST FREQUENCY:	1880.0MHz	SAR 1g:	0.643 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.372 W/kg
CONVERSION FACTORS:	0.346 / 0.346 / 0.346	SAR START:	0.108 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.107 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	-1.02 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

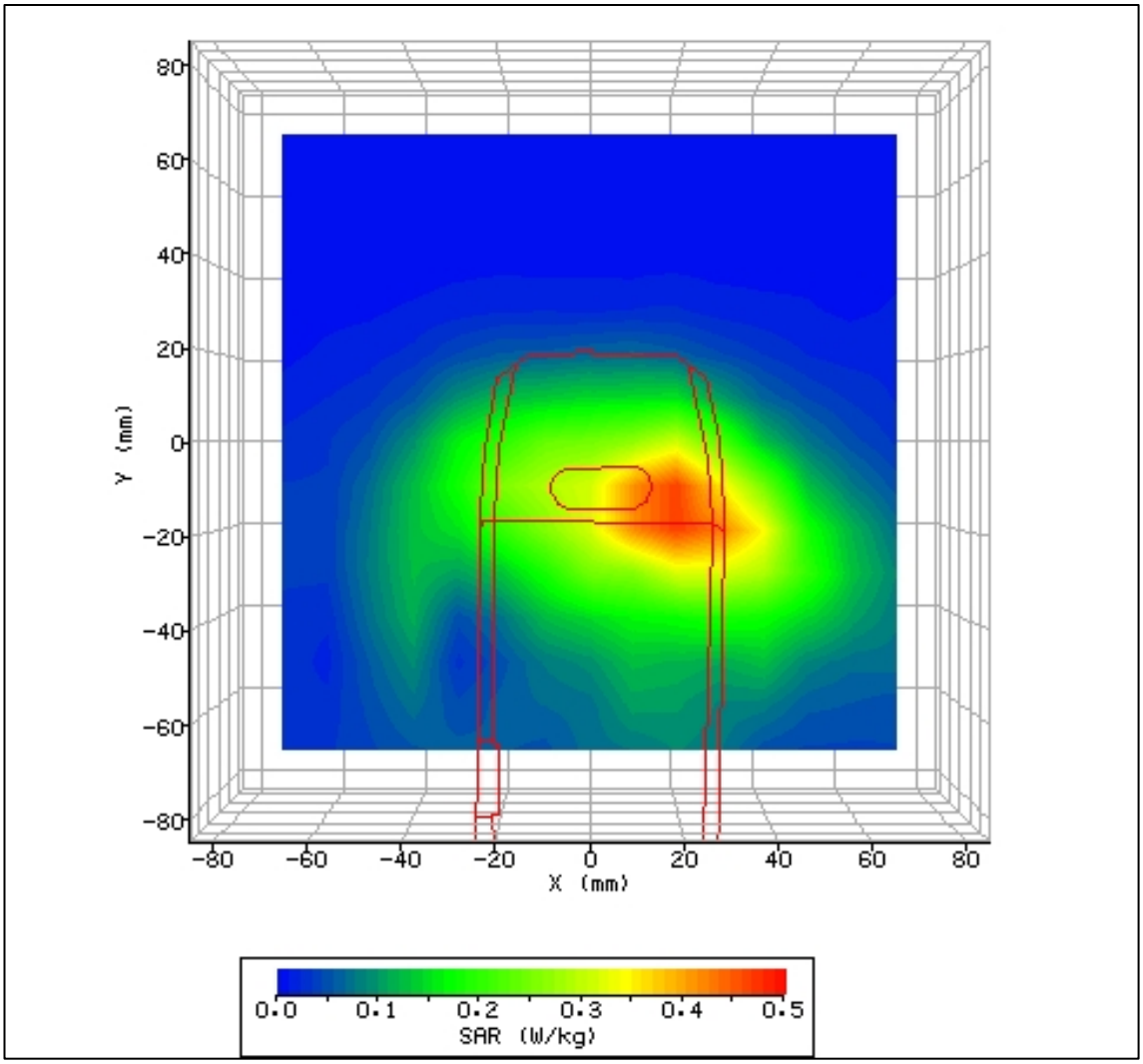

Figure 28: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 1880.0MHz (1900 GPRS Middle Channel) with 14mm Separation – Host 3 used

2.2 MAXIMUM 850 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	27/10/2005 12:25:14	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0026.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	23.3°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	56.3%	CONDUCTIVITY:	0.986
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-8.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	30.92 V/m
TEST FREQUENCY:	836.4MHz	SAR 1g:	1.097 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.722 W/kg
CONVERSION FACTORS:	0.273 / 0.273 / 0.273	SAR START:	0.275 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.270 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	-1.77 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

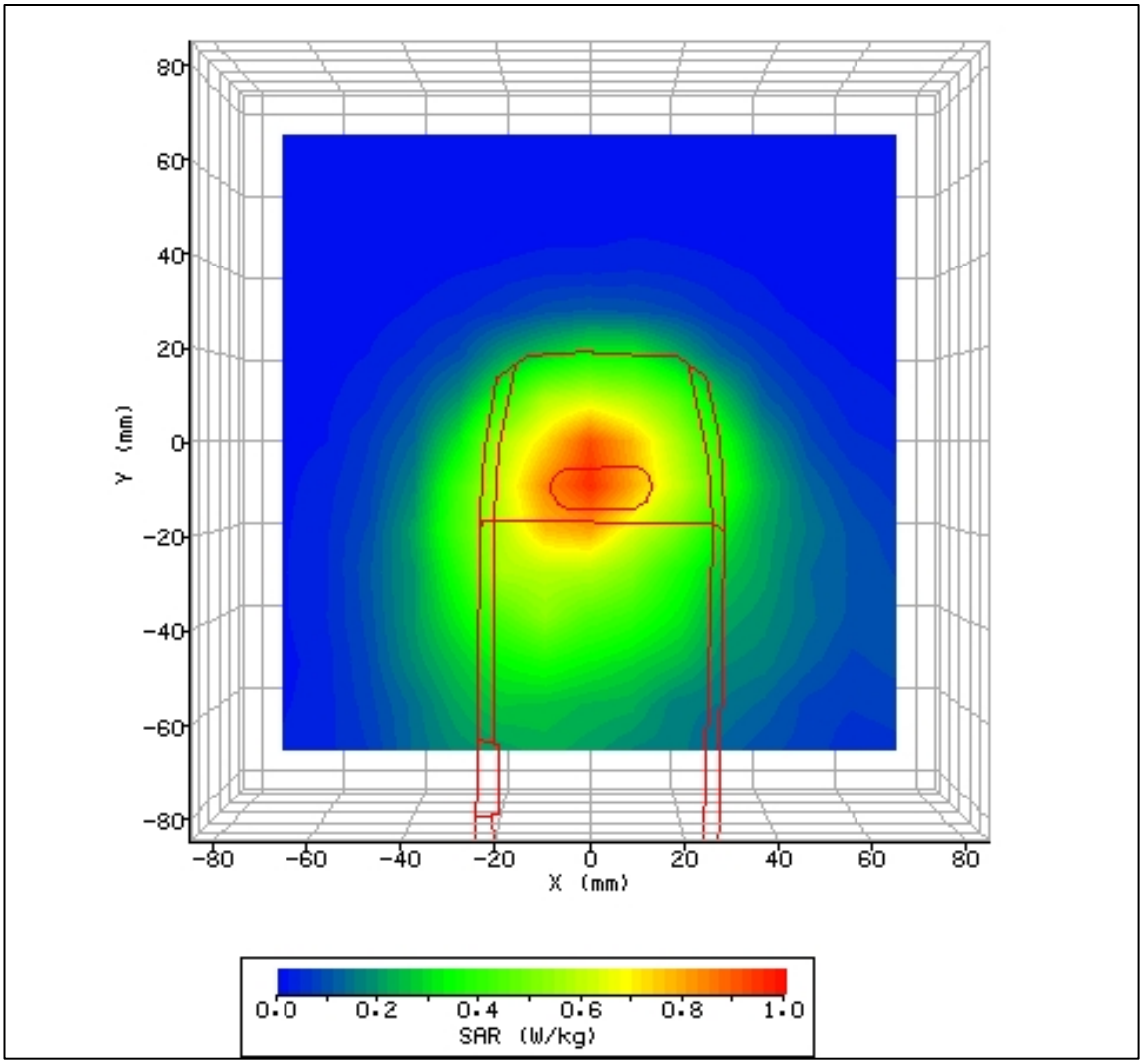

Figure 29: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 836.4MHz (850 GPRS Middle Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM 850 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	27/10/2005 13:24:45	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0027.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.8°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	56.4%	CONDUCTIVITY:	0.986
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	-1.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-7.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	28.50 V/m
TEST FREQUENCY:	824.2MHz	SAR 1g:	0.931 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.635 W/kg
CONVERSION FACTORS:	0.273 / 0.273 / 0.273	SAR START:	0.242 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.244 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	0.80 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

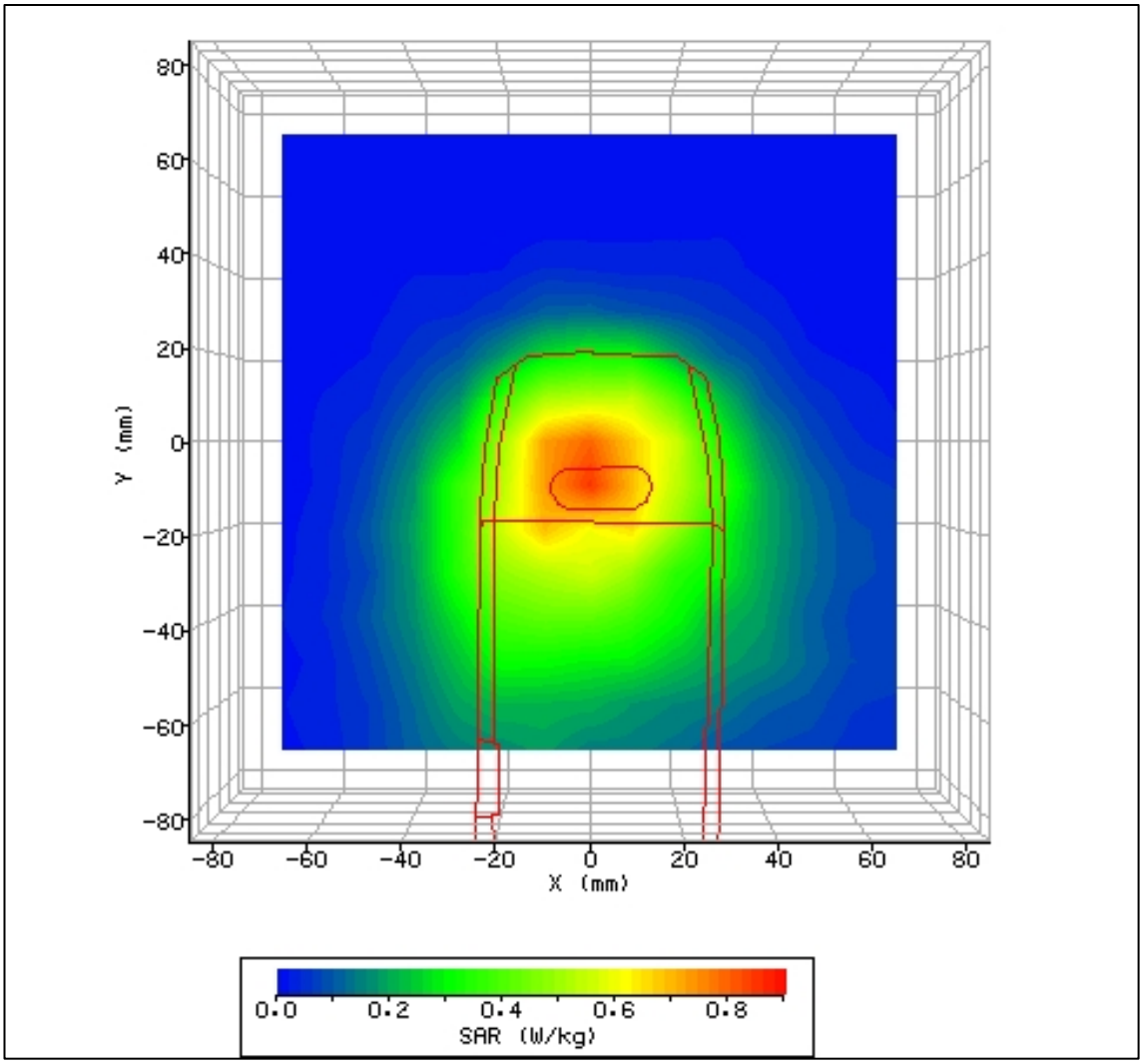

Figure 30: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 824.2MHz (850 GPRS Bottom Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM 850 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	27/10/2005 13:49:58	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0028.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.6°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	55.2%	CONDUCTIVITY:	0.986
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.4°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	0.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-8.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	31.02 V/m
TEST FREQUENCY:	848.8MHz	SAR 1g:	1.114 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.769 W/kg
CONVERSION FACTORS:	0.273 / 0.273 / 0.273	SAR START:	0.299 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.300 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	0.24 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

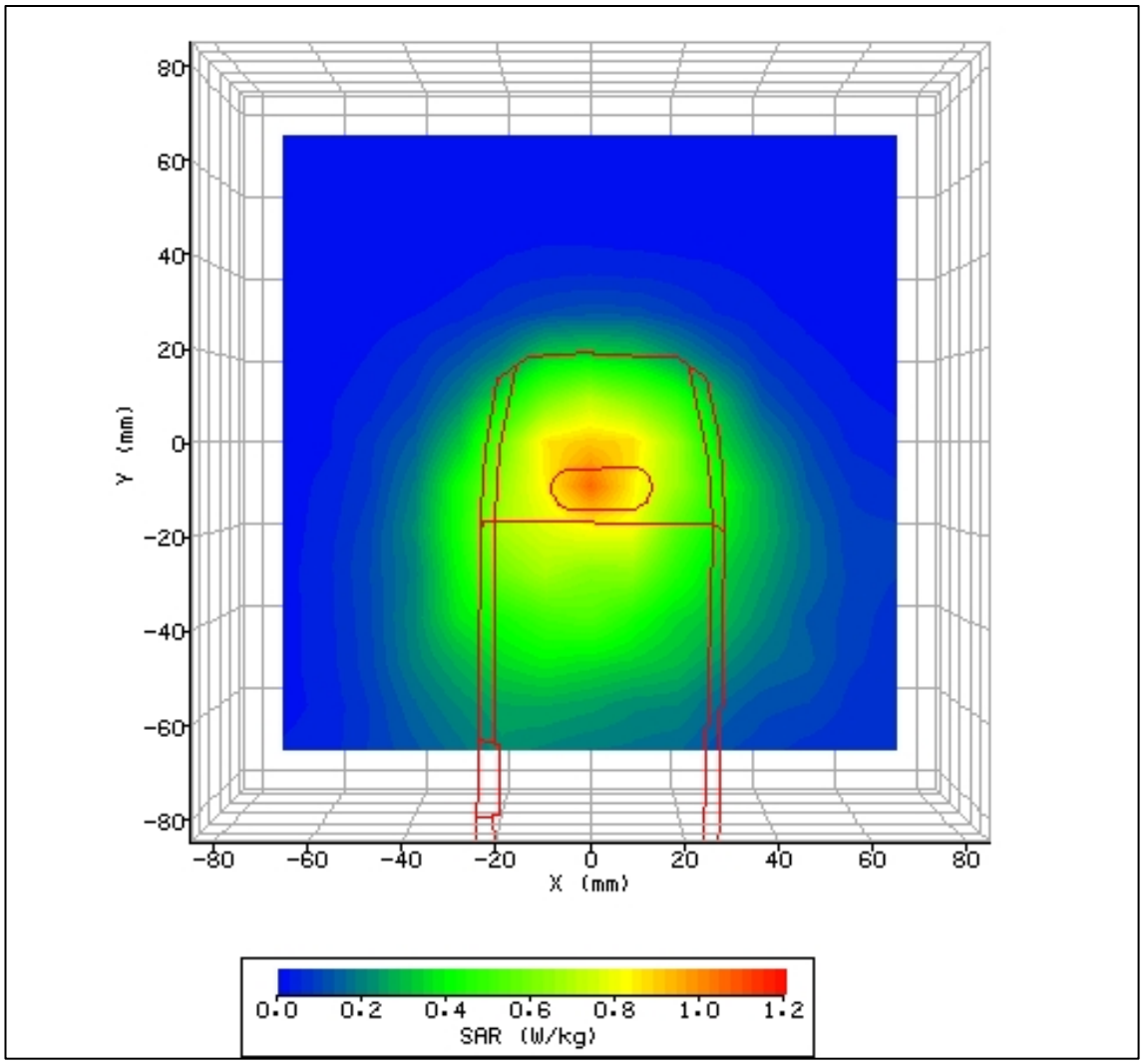

Figure 31: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 848.8MHz (850 GPRS Top Channel) with 10mm Separation – Host 1 used

2.2 MAXIMUM 850 GPRS SAR TEST RESULT INCLUDING COURSE AREA SCAN – 2D

SYSTEM / SOFTWARE:	SARA2 / 2.39 VPM	INPUT POWER DRIFT:	0.0dB
DATE / TIME:	28/10/2005 12:17:28	DUT BATTERY MODEL/NO:	N/A
FILENAME:	WS614714_0029.txt	PROBE SERIAL NUMBER:	170
AMBIENT TEMPERATURE:	22.5°C	LIQUID SIMULANT:	835 Body
DEVICE UNDER TEST:	Novatel U730 Card	RELATIVE PERMITTIVITY:	54.85
RELATIVE HUMIDITY:	52.3%	CONDUCTIVITY:	0.986
PHANTOM S/NO:	CubePhantom.csv	LIQUID TEMPERATURE:	22.3°C
PHANTOM ROTATION:	0°	MAX SAR X-AXIS LOCATION:	9.00 mm
DUT POSITION:	Rear Facing Phantom	MAX SAR Y-AXIS LOCATION:	-2.00 mm
ANTENNA CONFIGURATION:	Integral	MAX E FIELD:	35.44 V/m
TEST FREQUENCY:	848.8MHz	SAR 1g:	1.366 W/kg
AIR FACTORS:	406 / 385 / 409	SAR 10g:	0.945 W/kg
CONVERSION FACTORS:	0.273 / 0.273 / 0.273	SAR START:	0.399 W/kg
TYPE OF MODULATION:	GMSK	SAR END:	0.400 W/kg
MODN. DUTY CYCLE:	25%	SAR DRIFT DURING SCAN:	0.15 %
DIODE COMPRESSION FACTORS (V*200):	20 / 20 / 20	PROBE BATTERY LAST CHANGED:	14/10/05
INPUT POWER LEVEL:	Max	EXTRAPOLATION:	poly4

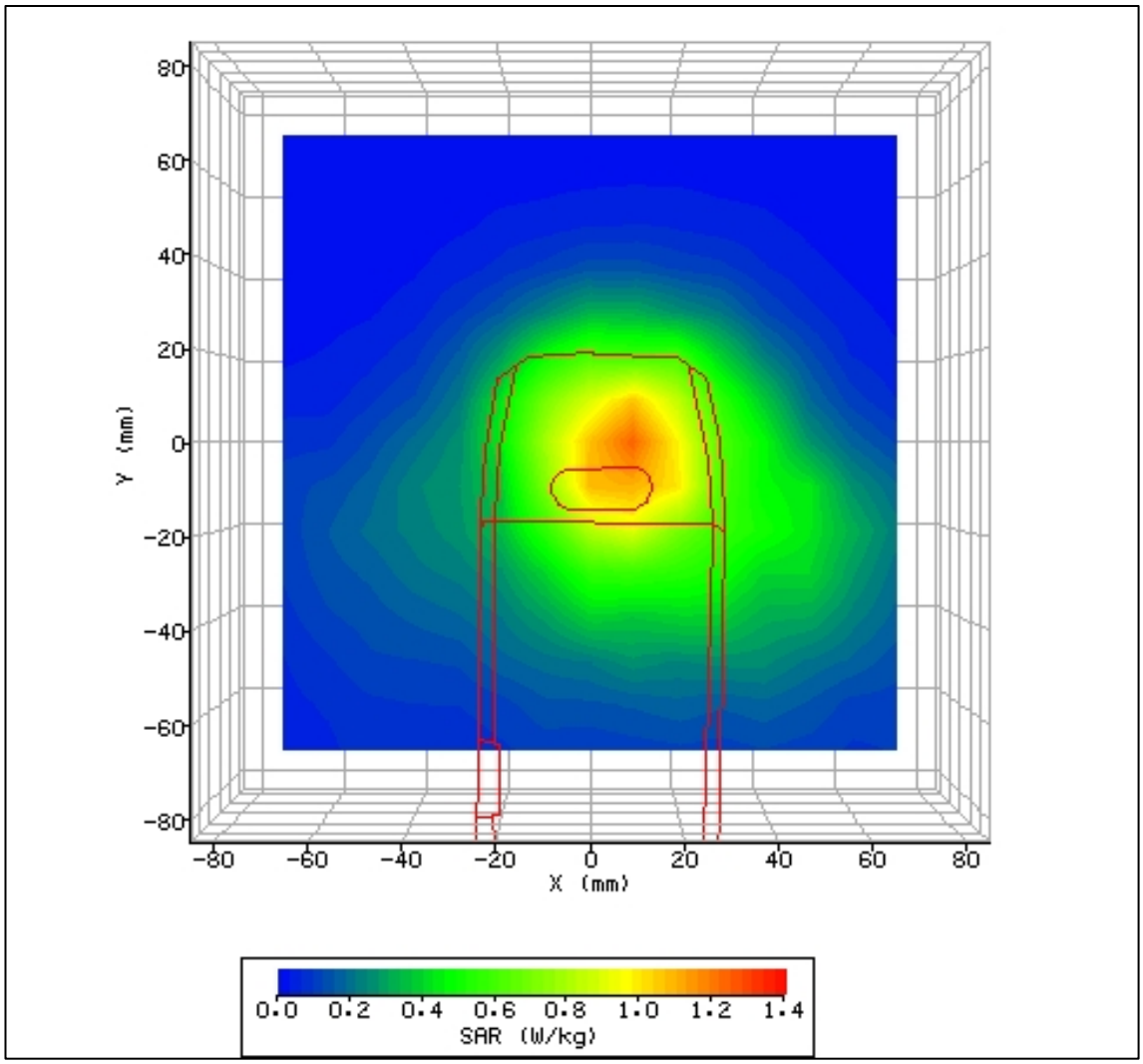

Figure 32: SAR Body Testing Results for the Novatel U730 Wireless PCMCIA Card in Rear Facing Phantom Position; Tested at 848.8MHz (850 GPRS Top Channel) with 18mm Separation – Host 2 used