# SAR EVALUATION REPORT

For

# GTRAN Wireless, Inc.

9605 Scranton Road, Suite 300
San Diego, CA 92121

**FCC ID: PL5GPC-6210**

August 1, 2002

| **This Report Concerns:** | **Equipment Type:** |
|---|---|
| ☒ Original Report | Wireless Data Terminal |

| | |
|---|---|
| **Test Engineer:** | Jeff Lee |
| **Report No.:** | R0207165S |
| **Test Date:** | July 26, 2002 |
| **Reviewed By:** | Benjamin Jing |
| **Prepared By:** | Bay Area Compliance Laboratory Corporation<br>230 Commercial Street<br>Sunnyvale, CA 94085<br>Tel: (408) 732-9162<br>Fax: (408) 732 9164 |

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# SUMMARY

The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996 [1].

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

The investigation was limited to the worst-case scenario from the device usage point of view. For the clarity of data analysis, and clarity of presentation, only one tissue simulation was used for the head and body simulation. This means that if SAR was found at the headset position, the magnitude of SAR would be overestimated comparing to SAR to a headset placed in the ear region.

There was no SAR of any concern measured on the device for any of the investigated configurations.

# 1 - REFERENCE

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[2] David L. Means Kwok Chan, Robert F. Cleveland, \Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields", Tech. Rep., Federal Communication Commission, O_ce of Engineering & Technology, Washington, DC, 1997.

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

[4] Niels Kuster, Ralph K.astle, and Thomas Schmid, \Dosimetric evaluation of mobile communications equipment with known precision", IEICE Transactions on Communications, vol. E80-B, no. 5, pp. 645{652, May 1997.

[5] CENELEC, \Considerations for evaluating of human exposure to electromagnetic fields (EMFs) from mobile telecommunication equipment (MTE) in the frequency range 30MHz - 6GHz", Tech. Rep., CENELEC, European Committee for Electrotechnical Standardization, Brussels, 1997.

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

[7] Katja Pokovic, Thomas Schmid, and Niels Kuster, \Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies", in ICECOM _ 97, Dubrovnik, October 15{17, 1997, pp. 120-24.

[8] Katja Pokovic, Thomas Schmid, and Niels Kuster, \E-_eld probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23{25 June, 1996, pp. 172-175.

[9] Volker Hombach, Klaus Meier, Michael Burkhardt, Eberhard K. uhn, and Niels Kuster, \The depen-dence of EM energy absorption upon human head modeling at 900 MHz", IEEE Transactions on Microwave Theory and Techniques, vol. 44, no. 10, pp. 1865-1873, Oct. 1996.

[10] Klaus Meier, Ralf Kastle, Volker Hombach, Roger Tay, and Niels Kuster, \The dependence of EM energy absorption upon human head modeling at 1800 MHz", IEEE Transactions on Microwave Theory and Techniques, Oct. 1997, in press.

[11] W. Gander, Computermathematik, Birkhaeuser, Basel, 1992.

[12] W. H. Press, S. A. Teukolsky,W. T. Vetterling, and B. P. Flannery, Numerical Recepies in C, The Art of Scientific Computing, Second Edition, Cambridge University Press, 1992.Dosimetric Evaluation of Sample device, month 1998 9

[13] NIS81 NAMAS, \The treatment of uncertainity in EMC measurement", Tech. Rep., NAMAS Executive, National Physical Laboratory, Teddington, Middlesex, England, 1994.

[14] Barry N. Taylor and Christ E. Kuyatt, \Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology, 1994. Dosimetric Evaluation of Sample device, month 1998 10

# 2 - TESTING EQUIPMENT

## 2.1 Equipments List & Calibration Info

| Type / Model | Cal. Date | S/N: |
|---|---|---|
| DASY3 Professional Dosimetric System | N/A | N/A |
| Robot RX60L | N/A | F00/5H31A1/A/01 |
| Robot Controller | N/A | F01/5J72A1/A/01 |
| Dell Computer Optiplex GX110 | N/A | N/A |
| Pentium III, Windows NT | N/A | N/A |
| SPEAG EDC3 | N/A | N/A |
| SPEAG DAE3 | 6/01 | 456 |
| SPEAG E-Field Probe ET3DV6 | 9/7/01 | 1604 |
| SPEAG Dummy Probe | N/A | N/A |
| SPEAG Generic Twin Phantom | N/A | N/A |
| SPEAG Light Alignment Sensor | N/A | 278 |
| SPEAG Validation Dipole D-1800-S-2 | 11/6/01 | BCL-049 |
| SPEAG Validation Dipole D900V2 | 9/3/01 | 122 |
| Brain Equivalent Matter (800MHz) | Daily | N/A |
| Brain Equivalent Matter (1900MHz) | Daily | N/A |
| Muscle Equivalent Matter (800MHz) | Daily | N/A |
| Muscle Equivalent Matter (1900MHz) | Daily | N/A |
| Robot Table | N/A | N/A |
| Phone Holder | N/A | N/A |
| Phantom Cover | N/A | N/A |
| HP Spectrum Analyzer HP8593GM | 6/20/01 | 3009A00791 |
| Microwave Amp. 8349B | N/A | 2644A02662 |
| Power Meter HP436A | 4/2/01 | 2709A29209 |
| Power Sensor HP8482A | 4/2/01 | 2349A08568 |
| Signal Generator RS SMIQ O3 | 2/10/01 | 1084800403 |
| Network Analyzer HP-8753ES | 7/30/01 | 820079 |
| Dielectric Probe Kit HP85070A | N/A | N/A |

## 2.2 IEEE SCC-34/SC-2 P1528 Recommended Tissue Dielectric Parameters

| Frequency | Head | | Body | |
|---|---|---|---|---|
| (MHz) | $\varepsilon_r$ | σ (S/m) | $\varepsilon_r$ | σ (S/m) |
| 150 | 52.3 | 0.76 | 61.9 | 0.80 |
| 300 | 45.3 | 0.87 | 58.2 | 0.92 |
| 450 | 43.5 | 0.87 | 56.7 | 0.94 |
| 835 | 41.5 | 0.90 | 55.2 | 0.97 |
| 900 | 41.5 | 0.97 | 55.0 | 1.05 |
| 915 | 41.5 | 0.98 | 55.0 | 1.06 |
| 1450 | 40.5 | 1.20 | 54.0 | 1.30 |
| 1610 | 40.3 | 1.29 | 53.8 | 1.40 |
| 1800-2000 | 40.0 | 1.40 | 53.2 | 1.52 |
| 2450 | 39.2 | 1.80 | 52.7 | 1.95 |
| 3000 | 38.5 | 2.40 | 52.0 | 2.73 |
| 5800 | 35.3 | 5.27 | 48.2 | 6.00 |

## 2.3 Equipment Calibration Certificate

Following is evaluated numbers for body tissue provided by the manufacturer.

**PROBE: ET3DV6 - SN:1604**

measured ConvF in head tissue at 900 MHz -> ConvF=6.52
measured ConvF in head tissue at 1800 MHz -> ConvF=5.52

| tissue | f(MHz) | eps | sigma | ConvF ± st.dev. |
|---|---|---|---|---|
| BODY | 835 | 55.2±5% | 0.97±5% | 6.4 ± 8% |
| BODY | 1900 | 53.3±5% | 1.52±5% | 4.9 ± 8% |

Please see the attached file for more information.

**Schmid & Partner Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

# Calibration Certificate

## Dosimetric E-Field Probe

| | |
|---|---|
| Type: | **ET3DV6** |
| Serial Number: | **1604** |
| Place of Calibration: | **Zurich** |
| Date of Calibration: | **August 26, 2002** |
| Calibration Interval | **12 months** |

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

| | |
|---|---|
| Calibrated by | N. Vetter |
| Approved by | Katja |

ET3DV6 SN:1604

August 26, 2002

# DASY3 - Parameters of Probe: ET3DV6 SN:1604

## Sensitivity in Free Space

| | | |
|---|---|---|
| NormX | 1.73 | $\mu V/(V/m)^2$ |
| NormY | 1.68 | $\mu V/(V/m)^2$ |
| NormZ | 1.72 | $\mu V/(V/m)^2$ |

## Diode Compression

| | | |
|---|---|---|
| DCP X | 93 | mV |
| DCP Y | 93 | mV |
| DCP Z | 93 | mV |

## Sensitivity in Tissue Simulating Liquid

| | | | |
|---|---|---|---|
| Head | 900 MHz | $\varepsilon_r$ = 41.5 ± 5% | σ = 0.97 ± 5% mho/m |
| Head | 835 MHz | $\varepsilon_r$ = 41.5 ± 5% | σ = 0.90 ± 5% mho/m |

| | | | | |
|---|---|---|---|---|
| ConvF X | 6.5 | ± 9.5% (k=2) | Boundary effect: | |
| ConvF Y | 6.5 | ± 9.5% (k=2) | Alpha | 0.36 |
| ConvF Z | 6.5 | ± 9.5% (k=2) | Depth | 2.82 |

| | | | |
|---|---|---|---|
| Head | 1800 MHz | $\varepsilon_r$ = 40.0 ± 5% | σ = 1.40 ± 5% mho/m |
| Head | 1900 MHz | $\varepsilon_r$ = 40.0 ± 5% | σ = 1.40 ± 5% mho/m |

| | | | | |
|---|---|---|---|---|
| ConvF X | 5.5 | ± 9.5% (k=2) | Boundary effect: | |
| ConvF Y | 5.5 | ± 9.5% (k=2) | Alpha | 0.50 |
| ConvF Z | 5.5 | ± 9.5% (k=2) | Depth | 2.46 |

## Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

| Probe Tip to Boundary | | 1 mm | 2 mm |
|---|---|---|---|
| $SAR_{be}$ [%] | Without Correction Algorithm | 11.1 | 6.6 |
| $SAR_{be}$ [%] | With Correction Algorithm | 0.4 | |

Head 1800 MHz Typical SAR gradient: 10 % per mm

| Probe Tip to Boundary | | 1 mm | 2 mm |
|---|---|---|---|
| $SAR_{be}$ [%] | Without Correction Algorithm | 12.3 | 8.1 |
| $SAR_{be}$ [%] | With Correction Algorithm | 0.1 | 0.1 |

## Sensor Offset

| | | |
|---|---|---|
| Probe Tip to Sensor Center | 2.7 | mm |
| Optical Surface Detection | 1.3 ± 0.2 | mm |

| Frequency | ε' | ε' |
|---|---|---|
| 700000000.0000 | 55.8228 | 22.1070 |
| 704000000.0000 | 55.8069 | 22.0670 |
| 708000000.0000 | 55.6674 | 22.1232 |
| 712000000.0000 | 55.6457 | 22.0764 |
| 716000000.0000 | 55.5904 | 22.1045 |
| 720000000.0000 | 55.5744 | 22.0556 |
| 724000000.0000 | 55.5436 | 22.0676 |
| 728000000.0000 | 55.5359 | 21.9813 |
| 732000000.0000 | 55.5128 | 21.9026 |
| 736000000.0000 | 55.4842 | 21.8320 |
| 740000000.0000 | 55.5522 | 21.8217 |
| 744000000.0000 | 55.4789 | 21.8160 |
| 748000000.0000 | 55.4323 | 21.7739 |
| 752000000.0000 | 55.3610 | 21.6491 |
| 756000000.0000 | 55.3940 | 21.6504 |
| 760000000.0000 | 55.3905 | 21.5273 |
| 764000000.0000 | 55.3407 | 21.5405 |
| 768000000.0000 | 55.2757 | 21.4252 |
| 772000000.0000 | 55.2600 | 21.3802 |
| 776000000.0000 | 55.3027 | 21.3390 |
| 780000000.0000 | 55.2339 | 21.3254 |
| 784000000.0000 | 55.2012 | 21.2524 |
| 788000000.0000 | 55.1419 | 21.2812 |
| 792000000.0000 | 55.0503 | 21.2436 |
| 796000000.0000 | 55.0239 | 21.2148 |
| 800000000.0000 | 54.9258 | 21.2321 |
| 804000000.0000 | 54.8471 | 21.2490 |
| 808000000.0000 | 54.7803 | 21.2511 |
| 812000000.0000 | 54.6930 | 21.2550 |
| 816000000.0000 | 54.7361 | 21.2460 |
| 820000000.0000 | 54.6441 | 21.2800 |
| 824000000.0000 | 54.6044 | 21.3681 |
| 828000000.0000 | 54.5172 | 21.3371 |
| 832000000.0000 | 54.4828 | 21.3192 |
| 836000000.0000 | 54.4473 | 21.3737 |
| 840000000.0000 | 54.3851 | 21.3085 |
| 844000000.0000 | 54.3766 | 21.3175 |
| 848000000.0000 | 54.3316 | 21.3150 |
| 852000000.0000 | 54.2955 | 21.2859 |
| 856000000.0000 | 54.2950 | 21.2643 |

| | | |
|---|---|---|
| 860000000.0000 | 54.2752 | 21.2223 |
| 864000000.0000 | 54.2943 | 21.1462 |
| 868000000.0000 | 54.2708 | 21.1199 |
| 872000000.0000 | 54.2147 | 21.0333 |
| 876000000.0000 | 54.2216 | 20.9734 |
| 880000000.0000 | 54.1765 | 20.9600 |
| 884000000.0000 | 54.2683 | 20.9265 |
| 888000000.0000 | 54.2298 | 20.8535 |
| 892000000.0000 | 54.2140 | 20.7895 |
| 896000000.0000 | 54.2961 | 20.6703 |
| 900000000.0000 | 54.3061 | 20.6436 |

| Frequency | ε | |
|---|---|---|
| 1700000000.0000 | 54.4221 | 13.5196 |
| 1706000000.0000 | 54.3133 | 13.4895 |
| 1712000000.0000 | 54.2990 | 13.4789 |
| 1718000000.0000 | 54.2501 | 13.4249 |
| 1724000000.0000 | 54.1843 | 13.4103 |
| 1730000000.0000 | 54.1357 | 13.3730 |
| 1736000000.0000 | 54.0602 | 13.3733 |
| 1742000000.0000 | 54.0277 | 13.4101 |
| 1748000000.0000 | 53.9734 | 13.4302 |
| 1754000000.0000 | 53.9618 | 13.5147 |
| 1760000000.0000 | 53.9242 | 13.5368 |
| 1766000000.0000 | 53.9035 | 13.5557 |
| 1772000000.0000 | 53.9154 | 13.6453 |
| 1778000000.0000 | 53.9367 | 13.6981 |
| 1784000000.0000 | 53.9566 | 13.7374 |
| 1790000000.0000 | 53.9393 | 13.7496 |
| 1796000000.0000 | 53.9036 | 13.7481 |
| 1802000000.0000 | 53.9056 | 13.7496 |
| 1808000000.0000 | 53.8591 | 13.7003 |
| 1814000000.0000 | 53.8790 | 13.6683 |
| 1820000000.0000 | 53.8525 | 13.6597 |
| 1826000000.0000 | 53.8360 | 13.6489 |
| 1832000000.0000 | 53.8236 | 13.5633 |
| 1838000000.0000 | 53.7536 | 13.5677 |
| 1844000000.0000 | 53.7145 | 13.4938 |
| 1850000000.0000 | 53.6494 | 13.4842 |
| 1856000000.0000 | 53.5798 | 13.4983 |
| 1862000000.0000 | 53.5523 | 13.5561 |
| 1868000000.0000 | 53.4641 | 13.6163 |
| 1874000000.0000 | 53.4500 | 13.7085 |
| 1880000000.0000 | 53.4281 | 13.7191 |
| 1886000000.0000 | 53.4681 | 13.7801 |
| 1892000000.0000 | 53.5001 | 13.8082 |
| 1898000000.0000 | 53.5092 | 13.8473 |
| 1904000000.0000 | 53.5673 | 13.8688 |
| 1910000000.0000 | 53.5665 | 13.8572 |
| 1916000000.0000 | 53.5687 | 13.9000 |
| 1922000000.0000 | 53.5960 | 13.8781 |
| 1928000000.0000 | 53.6163 | 13.8380 |
| 1934000000.0000 | 53.6226 | 13.7992 |

| | | |
|---|---|---|
| 1940000000.0000 | 53.5950 | 13.7812 |
| 1946000000.0000 | 53.5853 | 13.7474 |
| 1952000000.0000 | 53.5821 | 13.6989 |
| 1958000000.0000 | 53.5386 | 13.6569 |
| 1964000000.0000 | 53.4976 | 13.6628 |
| 1970000000.0000 | 53.4798 | 13.6564 |
| 1976000000.0000 | 53.4929 | 13.6682 |
| 1982000000.0000 | 53.4806 | 13.6796 |
| 1988000000.0000 | 53.4594 | 13.7108 |
| 1994000000.0000 | 53.4865 | 13.7521 |
| 2000000000.0000 | 53.5345 | 13.8023 |

# 3 - EUT DESCRIPTION

| | |
|---|---|
| Applicant: | GTRAN Wireless, Inc. |
| Product Description: | Wireless Data Terminal |
| Product Name: | GPC6210 |
| FCC ID: | PL5GPC-6210 |
| Serial Number: | None |
| Transmitter Frequency: | CDMA: 824~848MHz |
| | PCS: 1850~1910MHz |
| Maximum Output Power: | CDMA: 22.67dBm (184.93mW) |
| | PCS: 21.33dBm (135.83mW) |
| Dimension: | 3.8” L x 2.5”W x 0.2”H approximately |
| RF Exposure environment: | General Population/Uncontrolled |
| Power Supply: | Fed by IBM Laptop Power Adapter, M/N: 02K6549 |
| Applicable Standard | CDMA: FCC CFR 47, Part 22 |
| | PCS: FCC CFR 47, Part 24 |
| Application Type: | Certification |

*1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).*
*2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.*

*Note: The test data was good for test sample only. It may have deviation for other test samples.*

# 4 - DOSIMETRIC ASSESSMENT SETUP

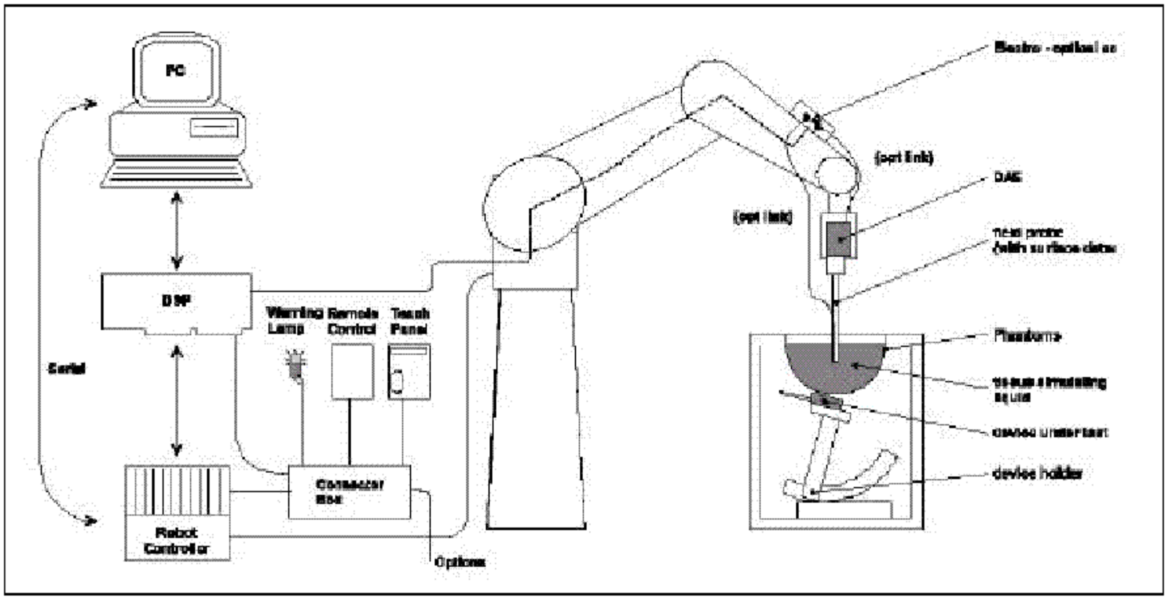
These measurements were performed with the automated near-field scanning system DASY3 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ±0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The system is described in detail in [3].

The SAR measurements were conducted with the dosimetric probe ET3DV6 SN: 1577 (manufactured by SPEAG), designed in the classical triangular configuration [3] and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in [7] with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure described in [8] and found to be better than ±0.25dB.

The phantom used was the \Generic Twin Phantom" described in [4]. The ear was simulated as a spacer of 4 mm thickness between the earpiece of the phone and the tissue simulating liquid. The Tissue simulation liquid used for each test is in according with the FCC OET65 supplement C as listed below.

| Ingredients (% by weight) | Frequency (MHz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 450 | | 835 | | 915 | | 1900 | | 2450 | |
| Tissue Type | Head | Body | Head | Body | Head | Body | Head | Body | Head | Body |
| Water | 38.56 | 51.16 | 41.45 | 52.4 | 41.05 | 56.0 | 54.9 | 40.4 | 62.7 | 73.2 |
| Salt (Nacl) | 3.95 | 1.49 | 1.45 | 1.4 | 1.35 | 0.76 | 0.18 | 0.5 | 0.5 | 0.04 |
| Sugar | 56.32 | 46.78 | 56.0 | 45.0 | 56.5 | 41.76 | 0.0 | 58.0 | 0.0 | 0.0 |
| HEC | 0.98 | 0.52 | 1.0 | 1.0 | 1.0 | 1.21 | 0.0 | 1.0 | 0.0 | 0.0 |
| Bactericide | 0.19 | 0.05 | 0.1 | 0.1 | 0.1 | 0.27 | 0.0 | 0.1 | 0.0 | 0.0 |
| Triton x-100 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.8 | 0.0 |
| DGBE | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 44.92 | 0.0 | 0.0 | 26.7 |
| Dielectric Constant | 43.42 | 58.0 | 42.54 | 56.1 | 42.0 | 55.9 | 39.9 | 54.3 | 39.8 | 53.6 |
| Conductivity (s/m) | 0.85 | 0.83 | 0.91 | 0.95 | 1.0 | 0.98 | 1.42 | 1.45 | 1.88 | 1.81 |

## 4.1 Measurement System Diagram

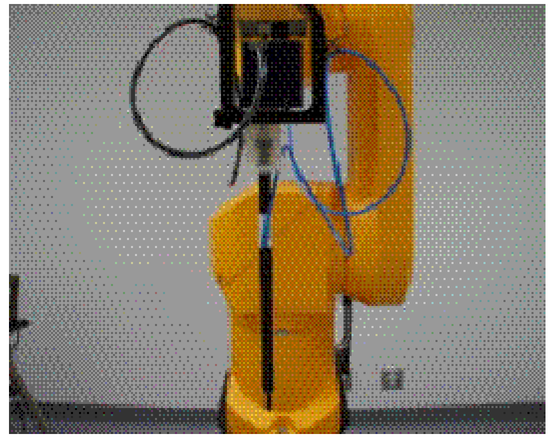



The DASY3 system for performing compliance tests consist of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software.
2. An arm extension for accommodating the data acquisition electronics (DAE).
3. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
4. A data acquisition electronic (DAE), which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
5. A unit to operate the optical surface detector, which is connected to the EOC. The Electro-optical coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the PC plug-in card. The functions of the PC plug-in card based on a DSP is to perform the time critical task such as signal filtering, surveillance of the robot operation fast movement interrupts.
6. A computer operating Windows 95 or larger
7. DASY3 software
8. Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling testing left-hand and right-hand usage.
10. The device holder for handheld EUT.
11. Tissue simulating liquid mixed according to the given recipes (see Application Note).
12. System validation dipoles to validate the proper functioning of the system.

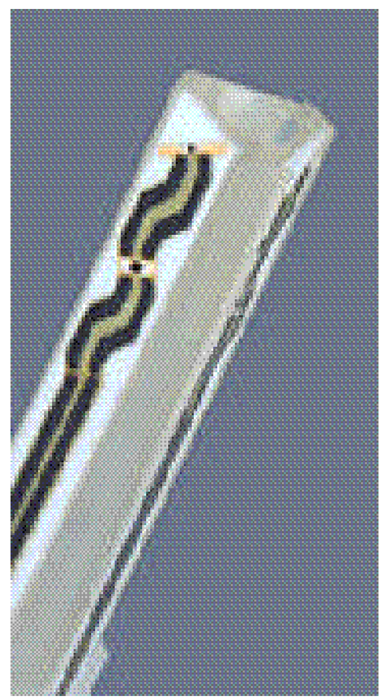
## 4.2. System Components

**ET3DV5 Probe Specification**
Construction Symmetrical design with triangular core
Built-in optical fiber for surface detection System
Built-in shielding against static charges
Calibration In air from 10 MHz to 2.5 GHz
In brain and muscle simulating tissue at
Frequencies of 450 MHz, 900 MHz and
1.8 GHz (accuracy ± 8%)
Frequency 10 MHz to > 6 GHz; Linearity: ± 0.2 dB
(30 MHz to 3 GHz)
Directivity ± 0.2 dB in brain tissue (rotation around
probe axis)
± 0.4 dB in brain tissue (rotation normal probe axis)
Dynamic 5 mW/g to > 100 mW/g;
Range Linearity: ± 0.2 dB
Surface ± 0.2 mm repeatability in air and clear liquids
Detection over diffuse reflecting surfaces.
Dimensions Overall length: 330 mm
Tip length: 16 mm
Body diameter: 12 mm
Tip diameter: 6.8 mm
Distance from probe tip to dipole centers: 2.7 mm
Application General dosimetric up to 3 GHz
Compliance tests of mobile phones
Fast automatic scanning in arbitrary phantoms



**Photograph of the probe**

The SAR measurements were conducted with the dosimetric probe ET3DV6 designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY3 software reads the reflection during a software approach and looks for the maximum using a 2 nd order fitting. The approach is stopped when reaching the maximum.



**Inside view of ET3DV6 E-field Probe**

**E-Field Probe Calibration Process**

Each probe is calibrated according to a dosimetric assessment procedure described in [6] with accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure described in [7] and found to be better than +/-0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

**Data Evaluation**

The DASY3 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

| | | |
|---|---|---|
| Probe Parameter: | -Sensitivity | $Norm_i$, $a_{i0}$, $a_{i1}$, $a_{i2}$ |
| | -Conversion Factor | ConvFi |
| | -Diode compression point | $Dcp_i$ |
| Device parameter: | -Frequency | f |
| | -Crest Factor | cf |
| Media parameter: | -Conductivity | σ |
| | -Density | ρ |

These parameters must be set correctly in the software. They can either be found in the component documents or be imported into the software from the configuration files issued for the DASY3 components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$Vi = Ui + (Ui)^2 \, cf / dcp_i$$

With Vi = compensated signal of channel i (i =x, y, z)
Ui = input signal of channel i (i =x, y, z)
cf = crest factor of exciting field (DASY parameter)
$dcp_i$ = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

H-field probes: $$H_i = \sqrt{Vi} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i =x, y, z)
$Norm_i$ = sensor sensitivity of channel i (i =x, y, z)
μV/ $(V/m)^2$ for E-field probes
ConF = sensitivity enhancement in solution
$a_{ij}$ = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strenggy of channel i in V/m
$H_i$ = diode compression point (DASY parameter)

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \text{Square Root } [(E_x)^2 + (E_y)^2 + (E_z)^2]$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot})^2 \cdot \sigma / (\rho \cdot 1000)$$

With SAR = local specific absorption rate in mW/g
$E_{tot}$ = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in $g/cm^3$

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

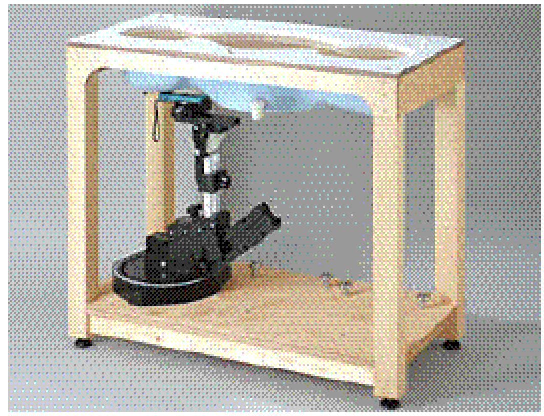
The power flow density is calculated assuming the excitation field as a free space field.

$$P_{pwe} = (E_{tot})^2 / 3770 \text{ or } P_{pwe} = (H_{tot})2 \cdot 37.7$$

With $P_{pwe}$ = equivalent power density of a plane wave in mW/cm3
$E_{tot}$ = total electric filed strength in V/m
$H_{tot}$ = total magnetic filed strength in V/m

**Generic Twin Phantom**

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users [9][10]. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allows the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.
Shell Thickness 2 ± 0.1 mm
Filling Volume Approx. 20 liters
Dimensions 810 x 1000 x 500 mm (H x L x W)

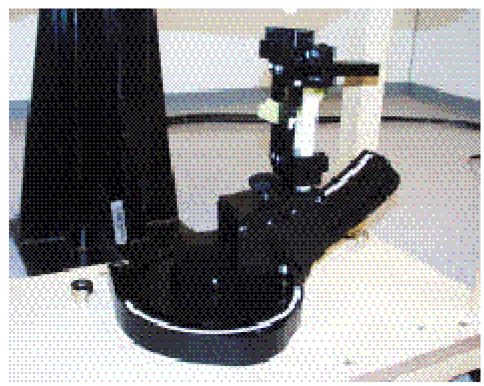


**Generic Twin Phantom**

**Device Holder**

In combination with the Generic Twin Phantom V3.0, the Mounting Device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

* Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations [10]. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.



**Device Holder**

### 4.3 Measurement Uncertainty

The uncertainty budget has been determined for the DASY3 measurement system according to the NIS81 [13] and the NIST1297 [14] documents and is given in the following Table.

| Uncertainty Description | Error | Distrib. | Weight | Std. Dev. | Offset |
|---|---|---|---|---|---|
| Probe Uncertainty | | | | | |
| Axial isotropy | ± 0.2 dB | U-shape | 0.5 | ±2.4 % | / |
| Spherical isotropy | ±0.4 dB | U-shape | 0.5 | ±4.8 % | / |
| Isotropy from gradient | ±0.5 dB | U-shape | 0 | / | / |
| Spatial resolution | ±0.5 % | Normal | 1 | ±0.5 % | / |
| Linearity error | ±0.2 dB | Rectangle | 1 | ±2.7 % | / |
| Calibration error | ±3.3 % | Normal | 1 | ± 3.3 % | / |
| SAR Evaluation Uncertainty | | | | | |
| Data acquisition error | ±1% | Rectangle | 1 | ±0.6 % | / |
| ELF and RF disturbances | ±0.25 % | Normal | 1 | ±0.25 % | / |
| Conductivity assessment | ±10 % | Rectangle | 1 | ± 5.8 % | / |
| Spatial Peak SAR Evaluation Uncertainty | | | | | |
| Extrapol boundary effect | ±3% | Normal | 1 | ±3% | ± 5% |
| Probe positioning error | ±0.1 mm | Normal | 1 | ± 1% | / |
| Integrat. and cube orient | ±3% | Normal | 1 | ±3% | / |
| Cube shape inaccuracies | ±2% | Rectangle | 1 | ±1.2 % | / |
| Device positioning | ±6% | Normal | 1 | ± 6% | / |
| Combined Uncertainties | / | / | 1 | ±11.7 % | ± 5% |
| Extended uncertainty (K = 2) | / | / | / | ± 23.5 %. | / |

# 5 - EVALUATION PROCEDURE

## 5.1 Simulated Tissue Liquid Parameter Confirmation

The dielectric parameters were checked prior to assessment using the HP85070A dielectric probe kit. The dielectric parameters measured are reported in each correspondent section:

## 5.2 System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

IEEE P1528 recommended reference value

| Frequency (MHz) | 1 g SAR | 10 g SAR | Local SAR at surface (above feed point) | Local SAR at surface (v=2cm offset from feed point) |
|---|---|---|---|---|
| 300 | 3.0 | 2.0 | 4.4 | 2.1 |
| 450 | 4.9 | 3.3 | 7.2 | 3.2 |
| 835 | 9.5 | 6.2 | 14.1 | 4.9 |
| 900 | 10.8 | 6.9 | 16.4 | 5.4 |
| 1450 | 29.0 | 16.0 | 50.2 | 6.5 |
| 1800 | 38.1 | 19.8 | 69.5 | 6.8 |
| 1900 | 39.7 | 20.5 | 72.1 | 6.6 |
| 2000 | 41.1 | 21.1 | 74.6 | 6.5 |
| 2450 | 52.4 | 24.0 | 104.2 | 7.7 |
| 3000 | 63.8 | 25.7 | 140.2 | 9.5 |

System validation result

| Simulant | Freq [MHz] | Parameters | Liquid Temp [ºC] | Target Value | Measured Value | Deviation | Limits [%] |
|---|---|---|---|---|---|---|---|
| Body | 835 | $\varepsilon_r$ | 23.4 | 56.1 | 54.9 | -2.1 | ±5 |
| | | σ | 23.4 | 0.95 | 0.98 | 3.2 | ±5 |
| | | 1g SAR | 23.4 | 9.5 | 8.92 | -6.1 | ±10 |
| Body | 1900 | $\varepsilon_r$ | 23.4 | 54.3 | 53.6 | -1.3 | ±5 |
| | | σ | 23.4 | 1.45 | 1.47 | 1.4 | ±5 |
| | | 1g SAR | 23.4 | 39.7 | 44.81 | 6.5 | ±10 |

$\varepsilon_r$ = relative permittivity, σ = conductivity and $\rho$=1000kg/m$^3$

Note: Input power = 19.95mW for CDMA, Input power = 82mW for PCS

## 5.3 SAR Evaluation Procedure

The evaluation was performed with the following procedure:

**Step 1:** Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop.

**Step 2**: The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head or EUT and the horizontal grid spacing was 20 mm x 20 mm. Based on these data, the area of the maximum absorption was determined by spline interpolation.

**Step 3**: Around this point, a volume of 32 mm x 32 mm x 34 mm was assessed by measuring 5 x 5 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm [11]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

2. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three onedimensional splines with the “Not a knot"-condition (in x, y and z-directions) [11], [12]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

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

**Step 4**: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

## 5.4 Exposure Limits

Table 1: Limits for Occupational/Controlled Exposure (W/kg)

| Whole-Body | Partial-Body | Hands. Wrists. Feet and Ankles |
|---|---|---|
| 0.4 | 8.0 | 20.0 |

Table 2: Limits for General Population/Uncontrolled Exposure (W/kg)

| Whole-Body | Partial-Body | Hands. Wrists. Feet and Ankles |
|---|---|---|
| 0.08 | 1.6 | 4.0 |

*Note: Whole-body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube SAR for hands, writs, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.*

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

*Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).*

*Population/uncontrolled environments Partial-body limit 1.6W/kg applied to the EUT.*

# 6 - TEST RESULTS

This page summarizes the results of the performed dosimetric evaluation. The plots with the corresponding SAR distributions, which reveal information about the location of the maximum SAR with respect to the device could be found in the following pages.

## 6.1 SAR Body-Worn Worst-Case Test Data

Ambient Temperature (ºC): 23.4
Relative Humidity%): 49.3

| Host | Position | Ch | Conducted Power (dBm) | Worst case SAR, averaged over 1g [mW/g] | | | |
|---|---|---|---|---|---|---|---|
| | | | | Setup condition (applicable checked) | | Measured | Limit |
| | | | | Antenna | Phantom | | |
| CDMA | | | | | | | |
| Compaq ipaq 3650 | Body | 825 | 21.83 | Built-in | EUT Back Side direct touch phantom | 0.238 | 1.6 |
| | Body | 835 | 22.50 | | | 0.191 | 1.6 |
| | Body | 845 | 22.83 | | | 0.259 | 1.6 |
| Compaq ipaq 3850 | Body | 825 | 23.33 | Built-in | EUT Back Side direct touch phantom | 0.271 | 1.6 |
| | Body | 835 | 23.17 | | | 0.289 | 1.6 |
| | Body | 845 | 21.50 | | | 0.385 | 1.6 |
| Compaq ipaq 3870 | Body | 825 | 22.50 | Built-in | EUT Back Side direct touch phantom | 0.235 | 1.6 |
| | Body | 835 | 22.33 | | | 0.208 | 1.6 |
| | Body | 845 | 22.83 | | | 0.300 | 1.6 |
| Dell Ppo1L | Body | 825 | 22.33 | Built-in | EUT Back Side direct touch phantom | 0.327 | 1.6 |
| | Body | 835 | 23.00 | | | 0.217 | 1.6 |
| | Body | 845 | 22.17 | | | 0.215 | 1.6 |
| HP T18. 033.C.00 | Body | 825 | 22.67 | Built-in | EUT Back Side direct touch phantom | 0.282 | 1.6 |
| | Body | 835 | 23.17 | | | 0.282 | 1.6 |
| | Body | 845 | 23.33 | | | 0.281 | 1.6 |
| IBM 1161 | Body | 825 | 22.50 | Built-in | EUT Back Side direct touch phantom | 0.704 | 1.6 |
| | Body | 835 | 21.17 | | | 0.700 | 1.6 |
| | Body | 845 | 22.67 | | | 0.701 | 1.6 |
| PCS | | | | | | | |
| Compaq ipaq 3650 | Body | 1850 | 17.7 * | Built-in | EUT Back Side direct touch phantom | 0.465 | 1.6 |
| | Body | 1880 | 19.6 * | | | 0.457 | 1.6 |
| | Body | 1905 | 21.2 * | | | 0.441 | 1.6 |
| Compaq ipaq 3850 | Body | 1850 | 17.1 * | Built-in | EUT Back Side direct touch phantom | 0.107 | 1.6 |
| | Body | 1880 | 19.2 * | | | 0.332 | 1.6 |
| | Body | 1905 | 20.6 * | | | 0.329 | 1.6 |
| Compaq ipaq 3870 | Body | 1850 | 17.1 * | Built-in | EUT Back Side direct touch phantom | 0.160 | 1.6 |
| | Body | 1880 | 20.1 * | | | 0.386 | 1.6 |
| | Body | 1905 | 21.2 * | | | 0.349 | 1.6 |
| Dell Ppo1L | Body | 1850 | 22.1 * | Built-in | EUT Back Side direct touch phantom | 0.504 | 1.6 |
| | Body | 1880 | 21.7 * | | | 0.512 | 1.6 |
| | Body | 1905 | 23.1 * | | | 0.515 | 1.6 |
| Hp T18. 033.C.00 | Body | 1850 | 19.2 * | Built-in | EUT Back Side direct touch phantom | 0.415 | 1.6 |
| | Body | 1880 | 22.3 * | | | 0.419 | 1.6 |
| | Body | 1905 | 21.7 * | | | 0.416 | 1.6 |
| IBM 1161 | Body | 1850 | 21.00 * | Built-in | EUT Back Side direct touch phantom | 0.476 | 1.6 |
| | Body | 1880 | 21.33 * | | | 0.475 | 1.6 |
| | Body | 1905 | 21.17 * | | | 0.478 | 1.6 |

*: EIRP

## 6.2 Plots of Test Result

Appendix A - Plots of SAR test data for Compaq ipaq 3650 at 835MHz and 1900MHz.

Appendix B - Plots of SAR test data for Compaq ipaq 3850 at 835MHz and 1900MHz.

Appendix C - Plots of SAR test data for Compaq ipaq 3870 at 835MHz and 1900MHz.

Appendix D - Plots of SAR test data for Dell PPo1L at 835MHz and 1900MHz.

Appendix E - Plots of SAR test data for HP T18.033.C.00 at 835MHz and 1900MHz.

Appendix F - Plots of SAR test data for IBM 1161 at 835MHz and 1900MHz.

Appendix G - Plots of SAR test data for Dipole validation at 835MHz and 1900MHz.

Appendix H - Plots of SAR test data for Z-Axis at 835MHz and 1900MHz.

Appendix I - Plots of CDMA output power for Compaq ipaq 3650.

Appendix J - Plots of CDMA output power for Compaq ipaq 3850.

Appendix K - Plots of CDMA output power for Compaq ipaq 3870.

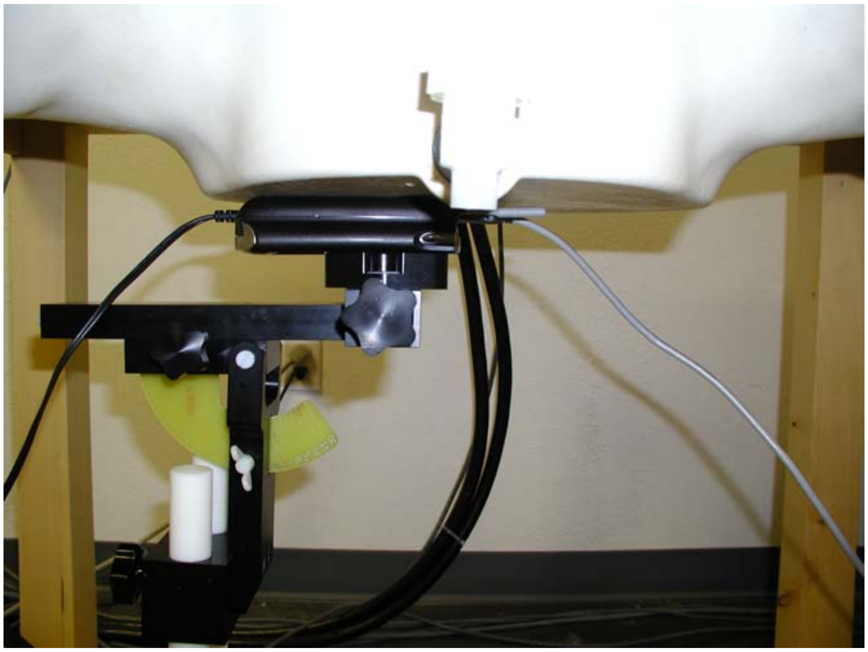
Appendix L - Plots of CDMA output power for Dell PPo1L.

Appendix M - Plots of CDMA output power for HP T18.033.C.00.

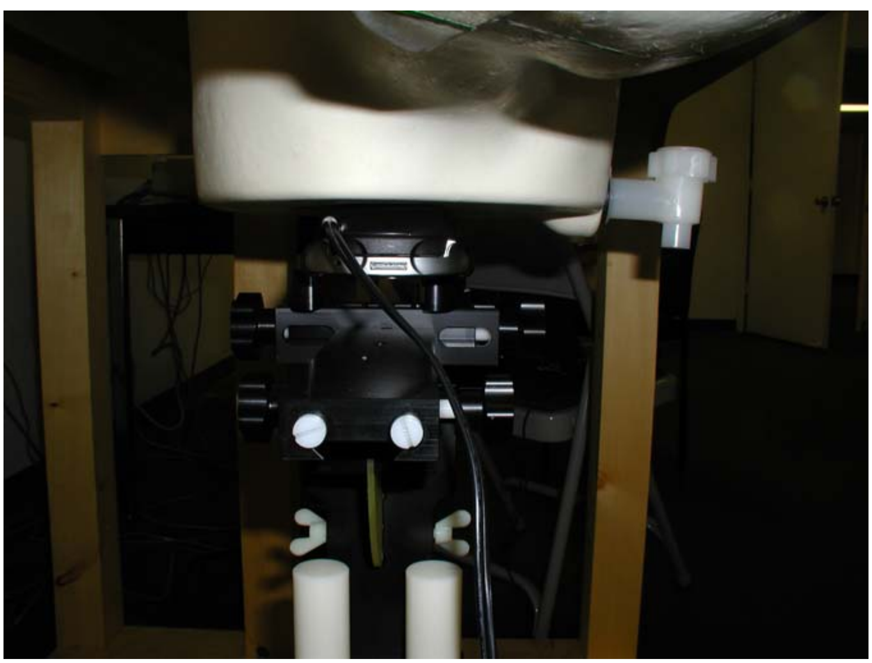
Appendix N - Plots of CDMA output power for host of IBM 1161.

# EXHIBIT A - SAR SETUP PHOTOGRAPHS

### W/ IPAQ Front View



### W/ IPAQ Left View



**W/ IPAQ Right View**

**W/ Laptop Front View**

**W/ Laptop Left View**


**W/ Laptop Side View**

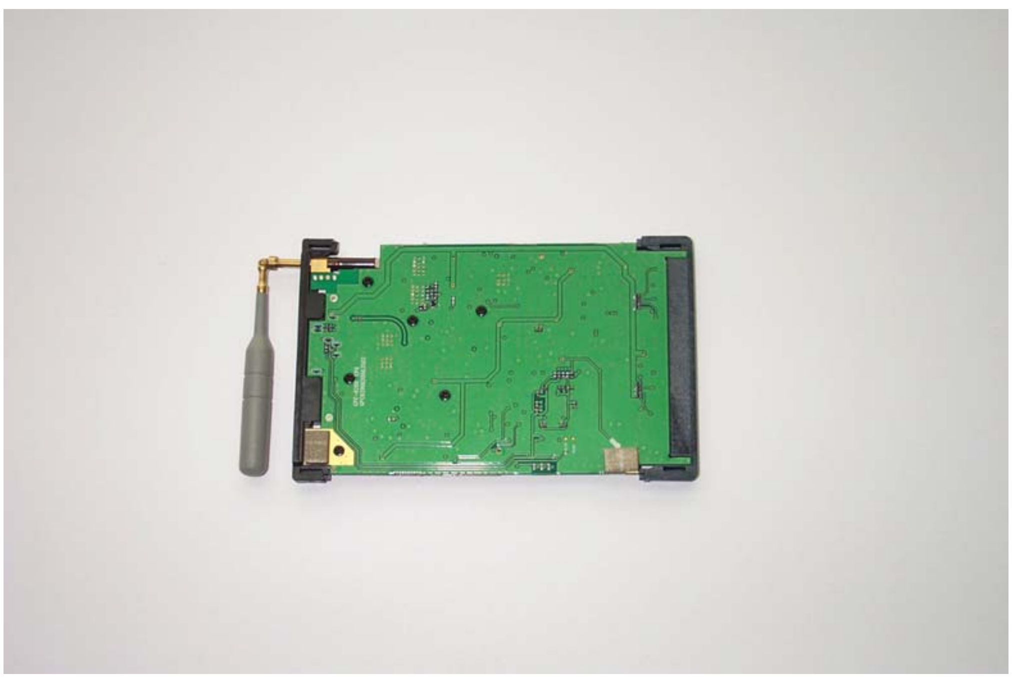
# EXHIBIT B - EUT PHOTOGRAPHS

### Chassis - Front View

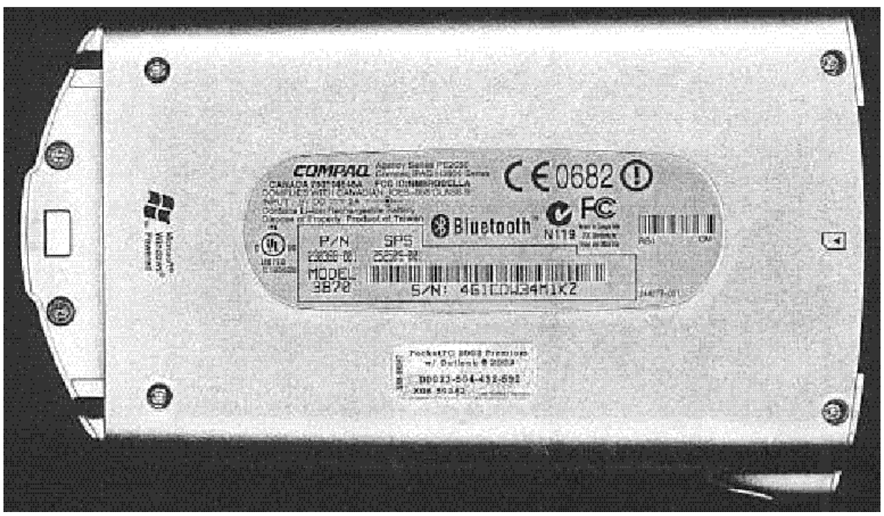

### Chassis - Back View

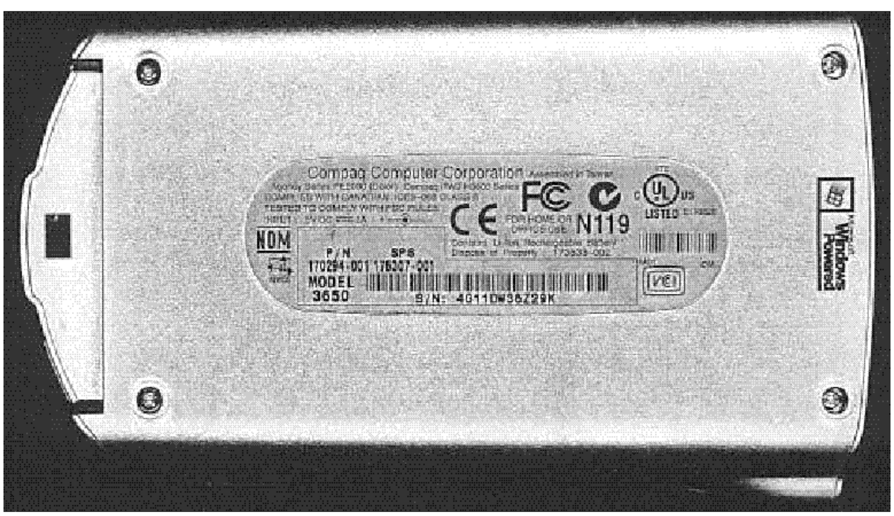
**Main Board - Component View**

**Main Board - Solder View**



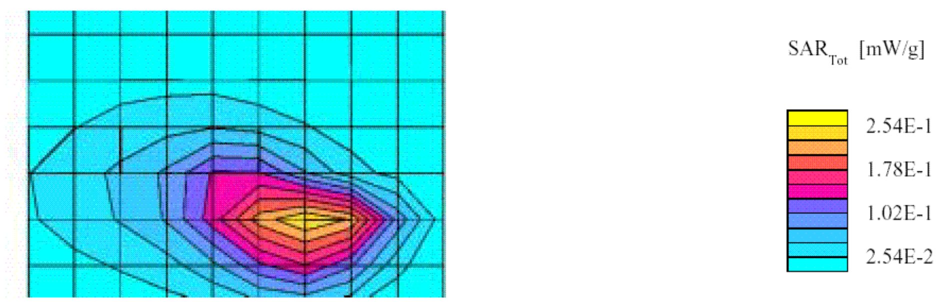
# EXHIBIT C - SUPPORT EQUIPMENT PHOTOGRAPHS

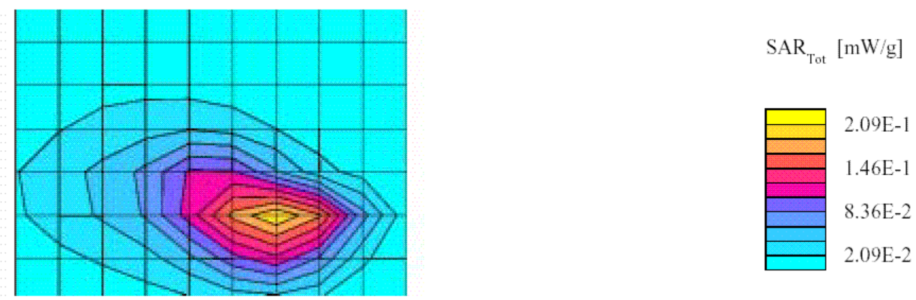
# APPENDIX A - PLOTS OF SAR TEST DATA FOR COMPAQ IPAQ 3650 AT 835MHZ AND 1900MHZ

GTran Wireless (Compaq ipaq 3650, 22 Deg, 10/4/02)
SAM Phantom; Section; Position: ; Frequency: 825 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.238 mW/g, SAR (10g): 0.133 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.01 dB



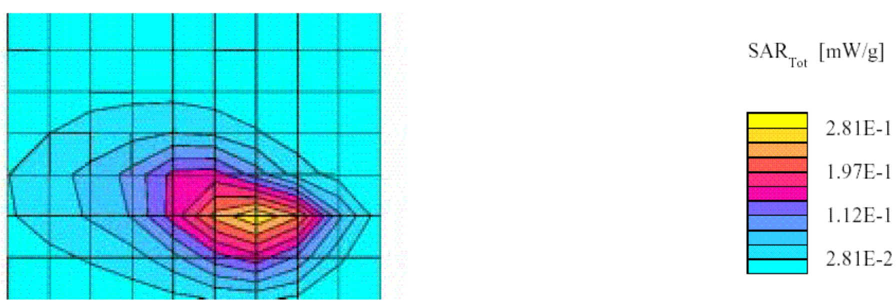
# GTran Wireless (Compaq ipaq 3650, 22 Deg., 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.191 mW/g, SAR (10g): 0.108 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.15 dB



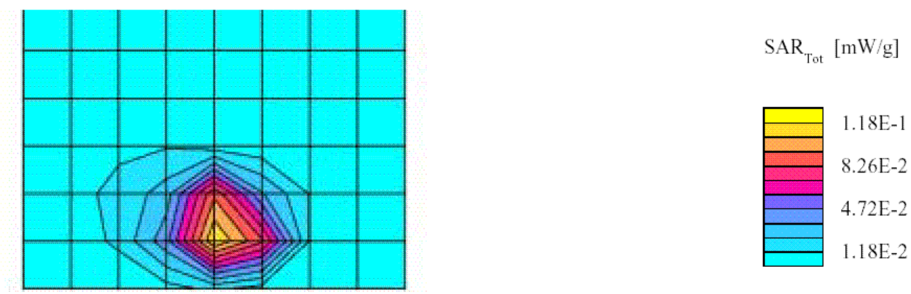
## GTran Wireless (Compaq ipaq 3650, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 845 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.259 mW/g, SAR (10g): 0.148 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.07 dB



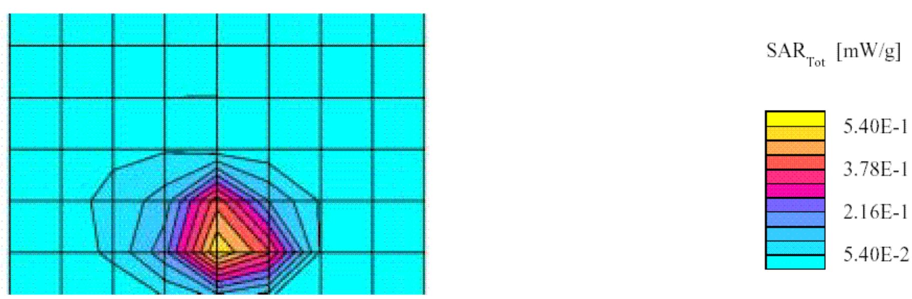
## GTran Wireless (Compaq ipaq 3650, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.465 mW/g, SAR (10g): 0.202 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.03 dB



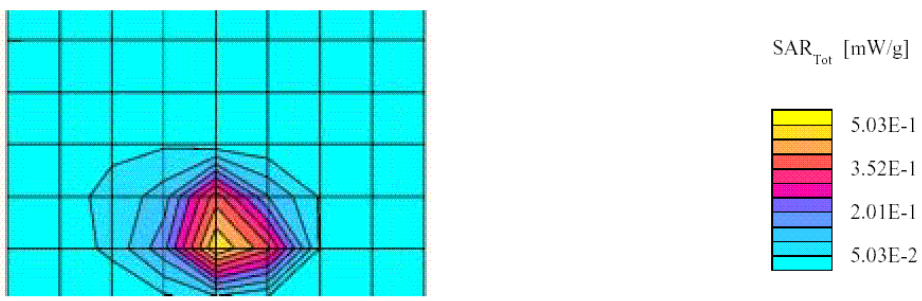
# GTran Wireless(Compaq ipaq 3650, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.457 mW/g, SAR (10g): 0.212 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.02 dB



## GTran Wireless (Compaq ipaq 3650, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1905 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.441 mW/g, SAR (10g): 0.204 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.04 dB



# APPENDIX B - PLOTS OF SAR TEST DATA FOR COMPAQ IPAQ 3850 AT 835MHZ AND 1900MHZ

GTran Wireless (Compaq ipaq 3850, 22 Deg., 10/4/02)

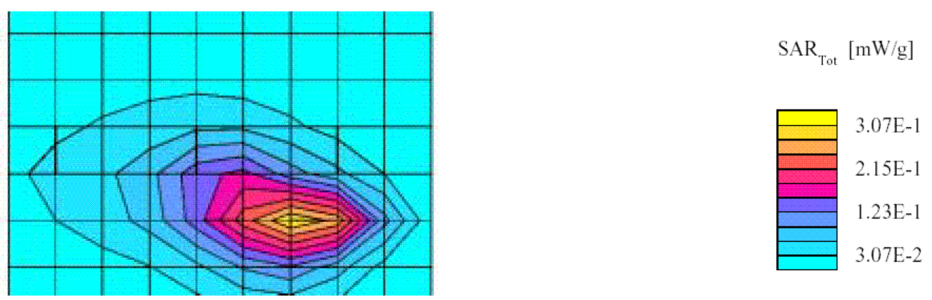
SAM Phantom; Section; Position: ; Frequency: 825 MHz

Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³

Cube 5x5x7: SAR (1g): 0.271 mW/g, SAR (10g): 0.151 mW/g, (Worst-case extrapolation)

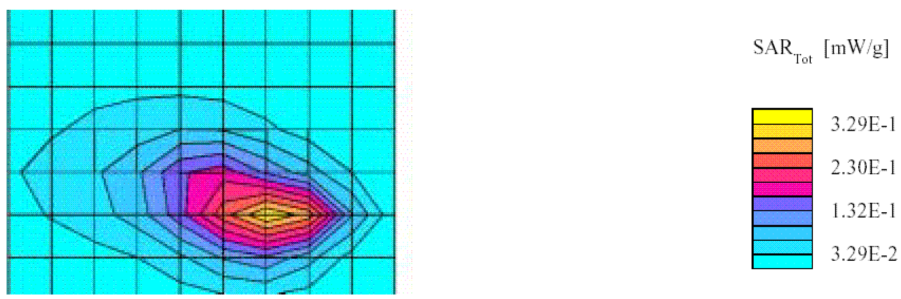
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0

Powerdrift: 0.01 dB



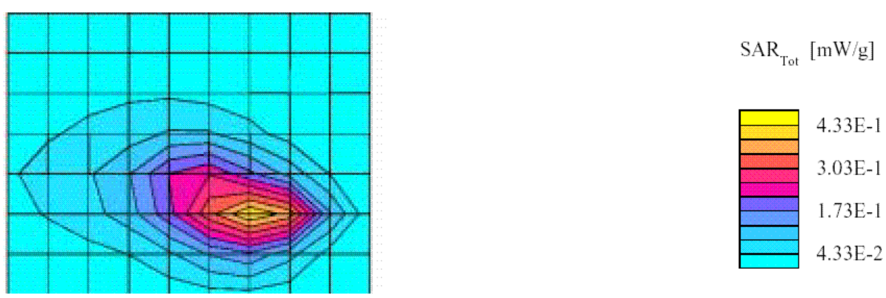
## GTran Wireless (Compaq ipaq 3850, 22 Deg., 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.289 mW/g, SAR (10g): 0.163 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.11 dB



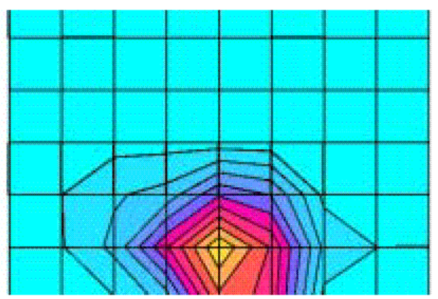
# GTran Wireless (Compaq ipaq 3850, 22 Deg., 10/4/02)

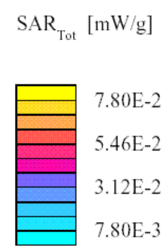
SAM Phantom; Section; Position: ; Frequency: 845 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.385 mW/g, SAR (10g): 0.218 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.04 dB



# GTran Wireless (Compaq ipaq 3850, 24 Deg, 10/4/02)

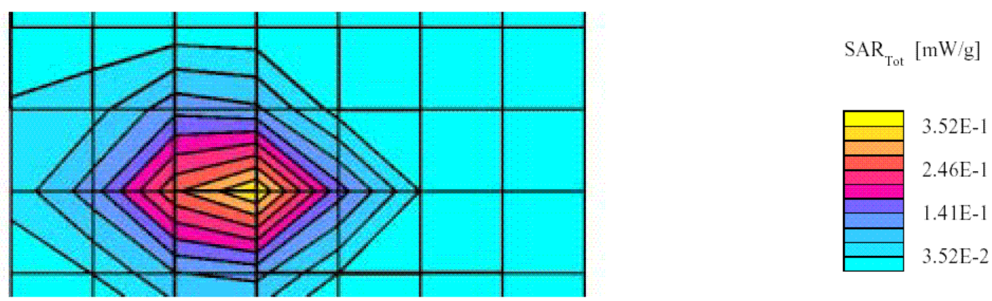
SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.107 mW/g, SAR (10g): 0.0504 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.56 dB





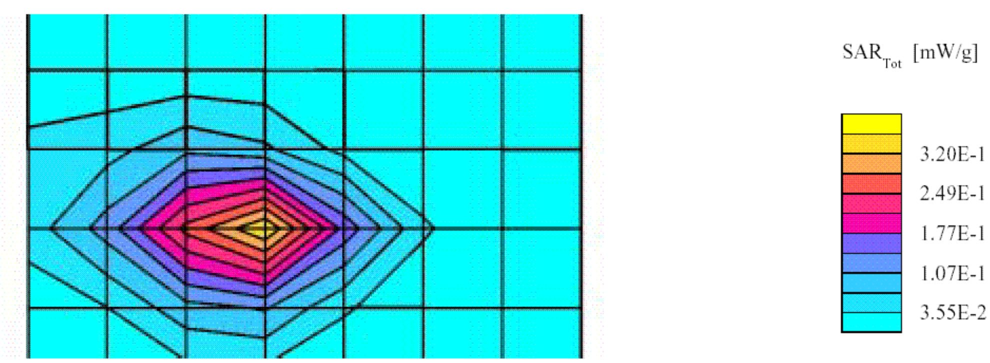
## GTran Wireless (Compaq ipaq 3850, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.332 mW/g, SAR (10g): 0.159 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 14.0
Powerdrift: -0.12 dB



# GTran Wireless (Compaq ipaq 3850, 24 Deg, 10/4/02)

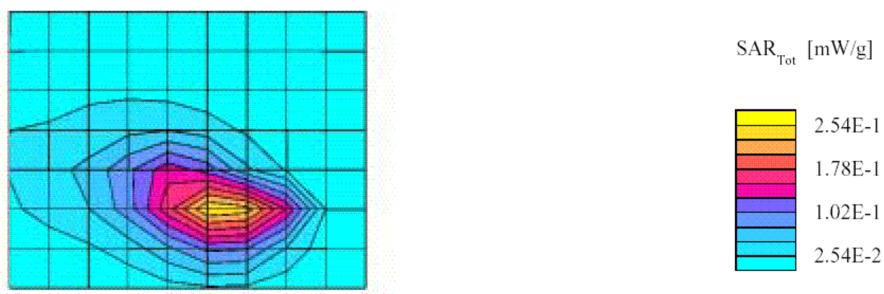
SAM Phantom; Section; Position: ; Frequency: 1905 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.329 mW/g, SAR (10g): 0.149 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 14.0
Powerdrift: -0.02 dB



# APPENDIX C - PLOTS OF SAR TEST DATA FOR COMPAQ IPAQ 3870 AT 835MHZ AND 1900MHZ

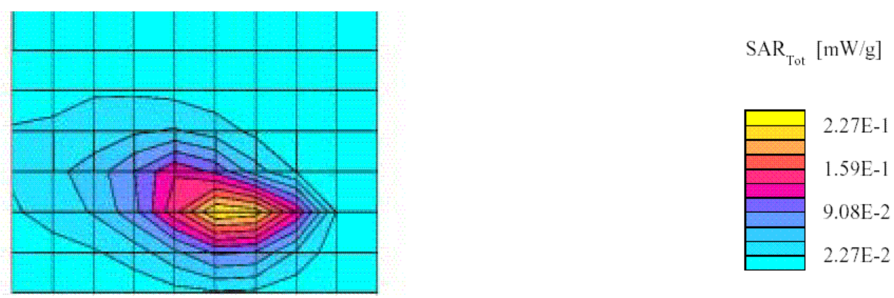
GTran Wireless (Compaq ipad 3870, 22 Deg., 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 825 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.235 mW/g, SAR (10g): 0.132 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.20 dB



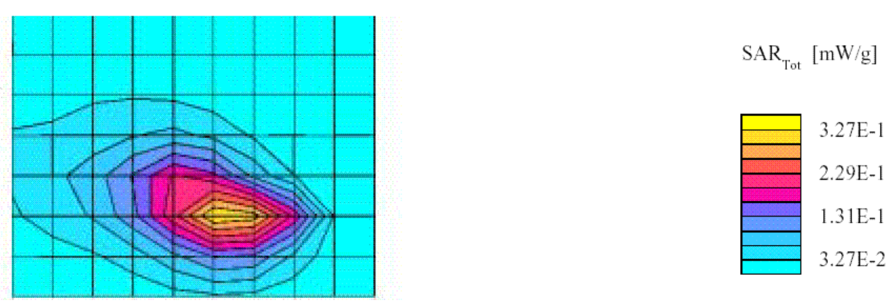
## GTran Wireless (Compaq ipaq 3870, 22 Deg., 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.208 mW/g, SAR (10g): 0.116 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.13 dB



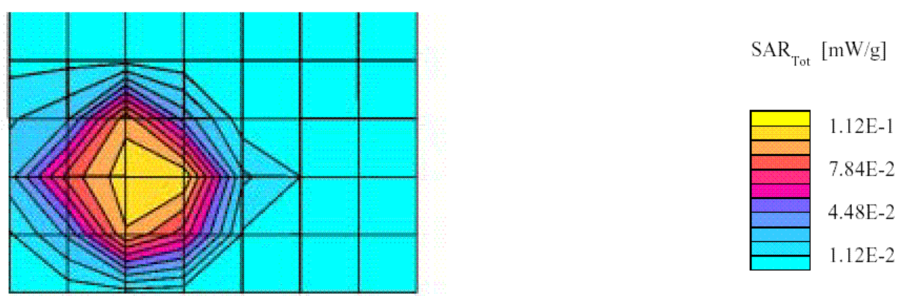
## GTran Wireless (Compaq ipaq 3870, 22 Deg., 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 845 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.300 mW/g, SAR (10g): 0.170 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.05 dB



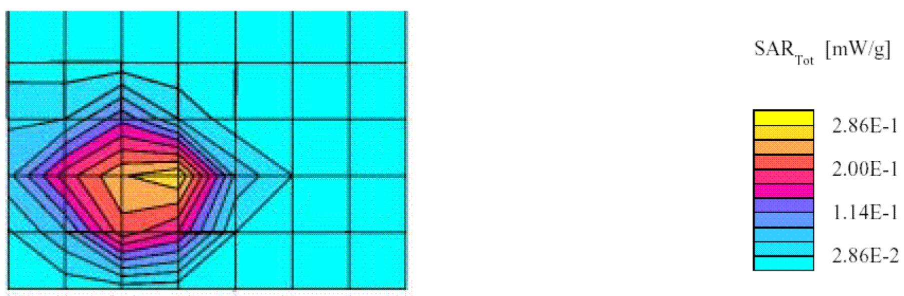
## GTran Wireless (Compaq ipaq 3870, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.160 mW/g, SAR (10g): 0.0770 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 14.0
Powerdrift: -0.01 dB



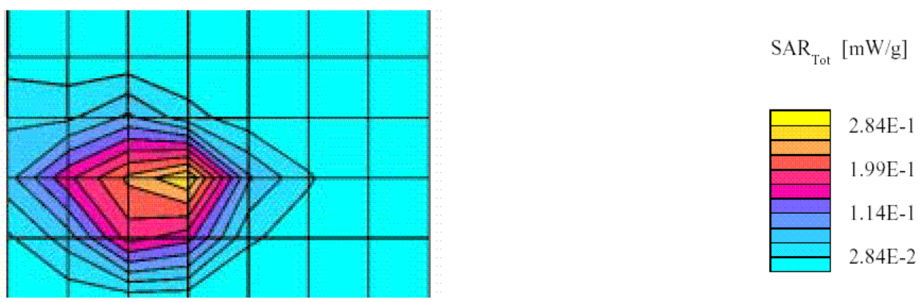
# GTran Wireless (Compaq ipaq 3870, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.386 mW/g, SAR (10g): 0.182 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 14.0
Powerdrift: -0.17 dB



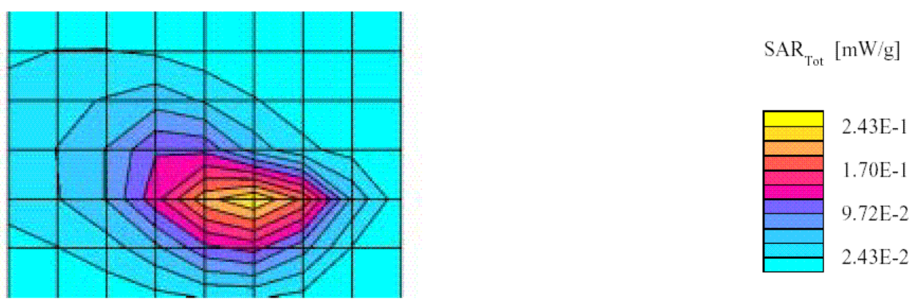
# GTran Wireless (Compaq ipaq 3870, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1905 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.47$ mho/m $\varepsilon_r = 53.6$ $\rho = 1.00$ g/cm³
Cube 5x5x7: SAR (1g): 0.349 mW/g, SAR (10g): 0.163 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 14.0
Powerdrift: -0.18 dB



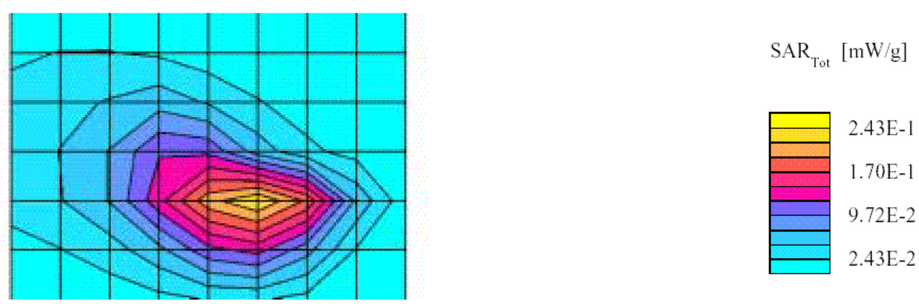
# APPENDIX D - PLOTS OF SAR TEST DATA FOR DELL PPO1L AT 835MHZ AND 1900MHZ

GTran Wireless (Dell PPo1L, 22 Deg, 10/4/02)
SAM Phantom; Section; Position: ; Frequency: 825 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.327 mW/g, SAR (10g): 0.185 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.01 dB



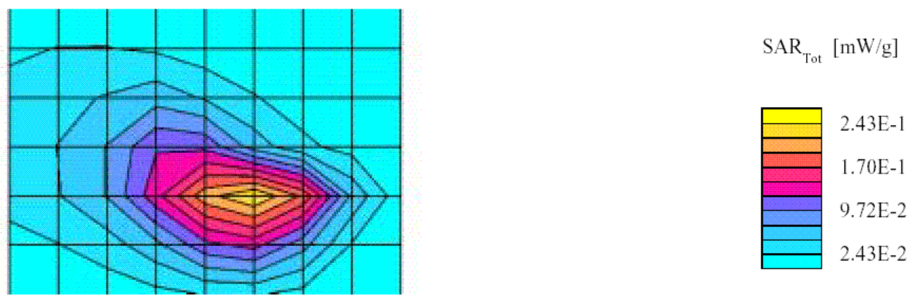
# GTran Wireless (Dell PPo1L, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.217 mW/g, SAR (10g): 0.122 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.20 dB



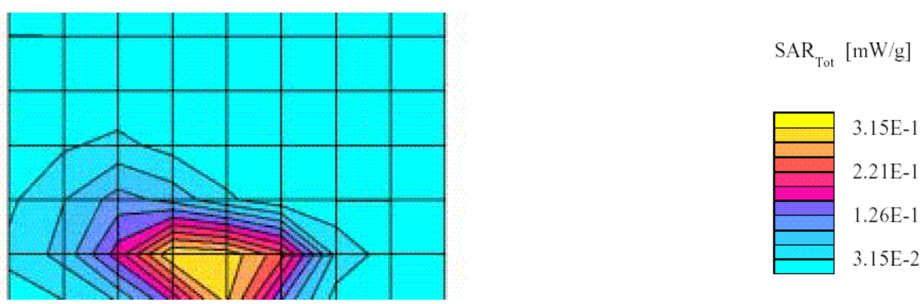
## GTran Wireless (Dell PPo1L, 22 Deg, 10/4/02)

SAM Phantom;  Section; Position: ; Frequency: 845 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm$^3$
Cube 5x5x7: SAR (1g): 0.215  mW/g, SAR (10g): 0.122  mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.19 dB



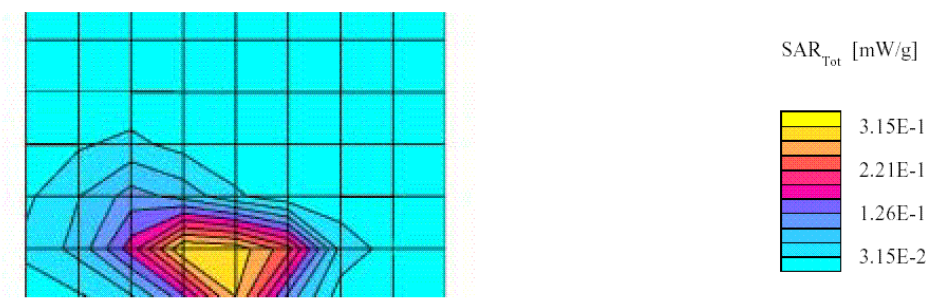
GTran Wireless (Dell PPo1L, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.504 mW/g, SAR (10g): 0.225 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.07 dB



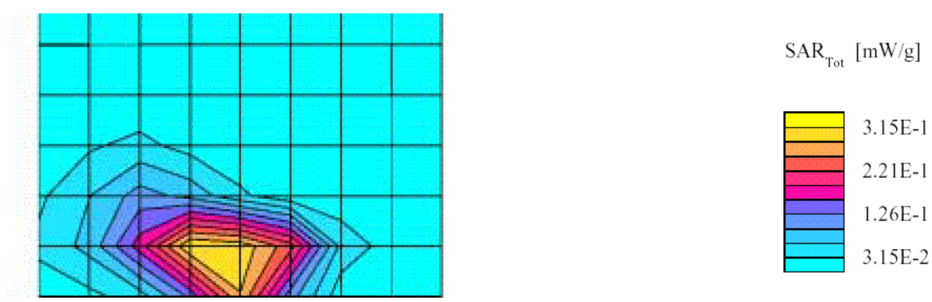
GTran Wireless (Dell PPo1L, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.512 mW/g, SAR (10g): 0.227 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.06 dB



## GTran Wireless (Dell PPo1L, 24 Deg, 10/4/02)

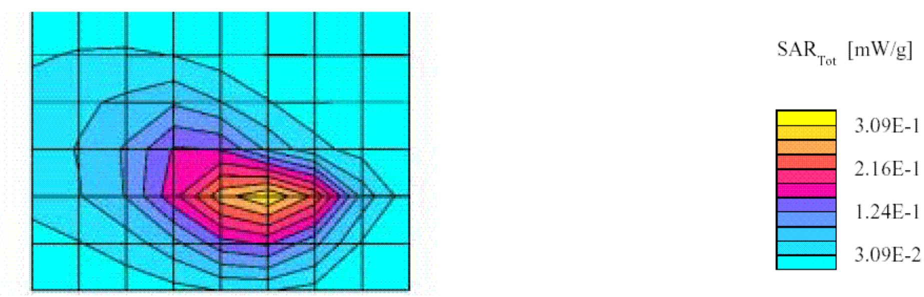
SAM Phantom; Section; Position: ; Frequency: 1905 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.515 mW/g, SAR (10g): 0.229 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.05 dB



# APPENDIX E - PLOTS OF SAR TEST DATA FOR HP T18.033.C.00 AT 835MHZ AND 1900MHZ

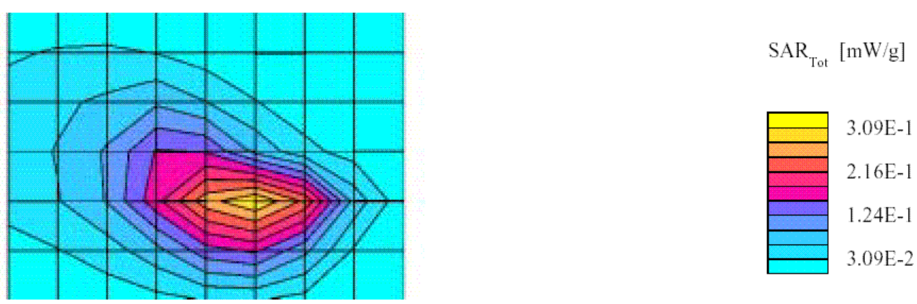
GTran Wireless (HP T18.033.C.00, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 825 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.282 mW/g, SAR (10g): 0.160 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.05 dB



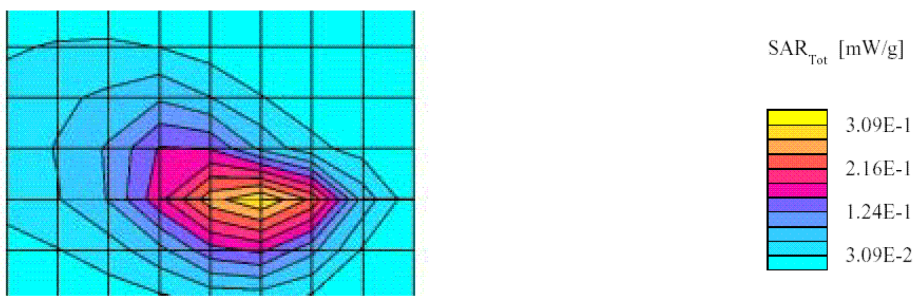
## GTran Wireless (HP T18.033.C.00, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.282 mW/g, SAR (10g): 0.160 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.05 dB



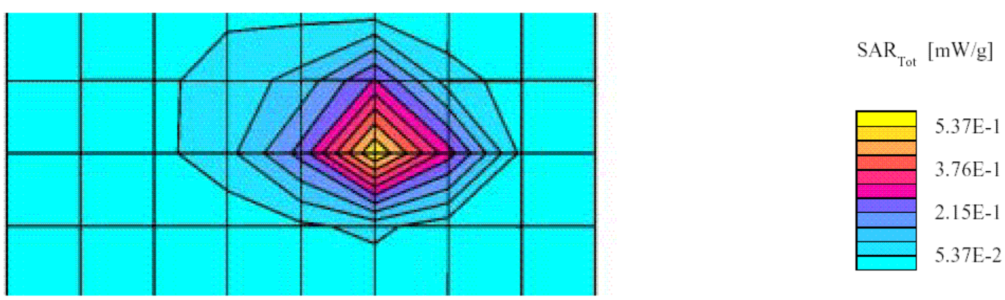
# GTran Wireless (HP T18.033.C.00, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 845 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.281 mW/g, SAR (10g): 0.159 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.00 dB



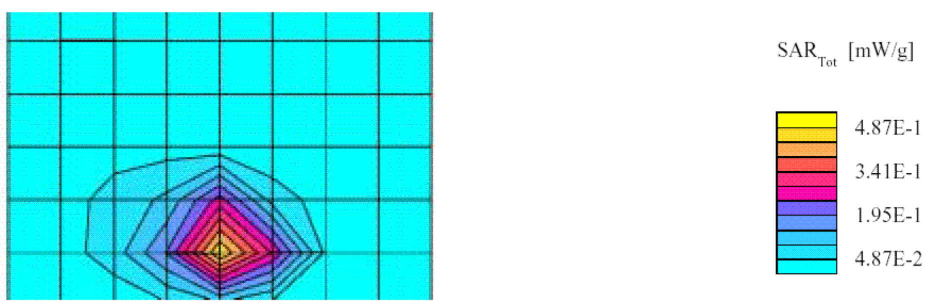
## GTran Wireless (HP T18.033.C.00, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm$^3$
Cube 5x5x7: SAR (1g): 0.415 mW/g, SAR (10g): 0.186 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.01 dB



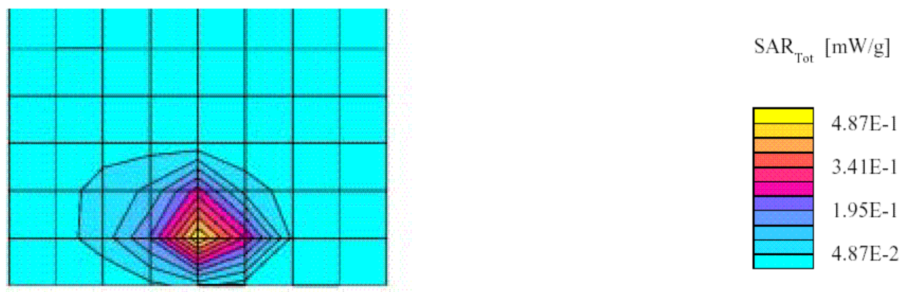
# GTran Wireless (HP T18.033.C.00, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.419 mW/g, SAR (10g): 0.181 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.05 dB



GTran Wireless (HP T18.033.C.00, 24 Deg, 10/4/02)

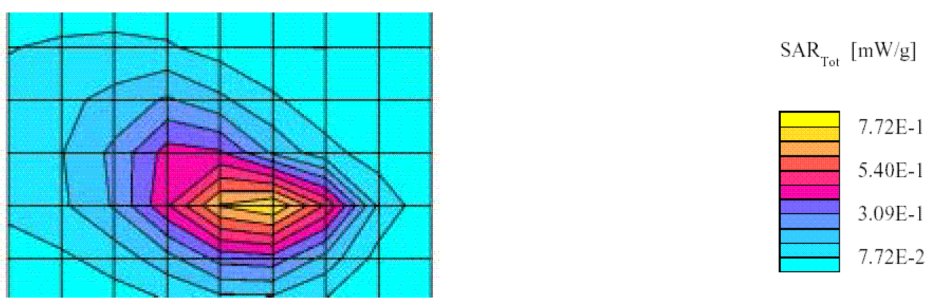
SAM Phantom; Section; Position: ; Frequency: 1905 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.416 mW/g, SAR (10g): 0.179 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.02 dB



# APPENDIX F - PLOTS OF SAR TEST DATA FOR HOST OF IBM 1161 AT 835MHZ AND 1900MHZ

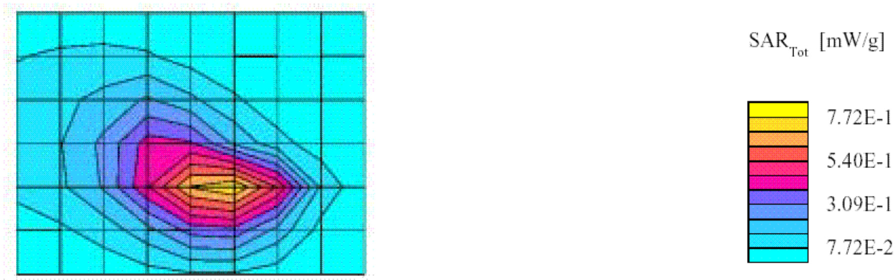
GTran Wireless (IBM 1161, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 825 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.704 mW/g, SAR (10g): 0.395 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.01 dB



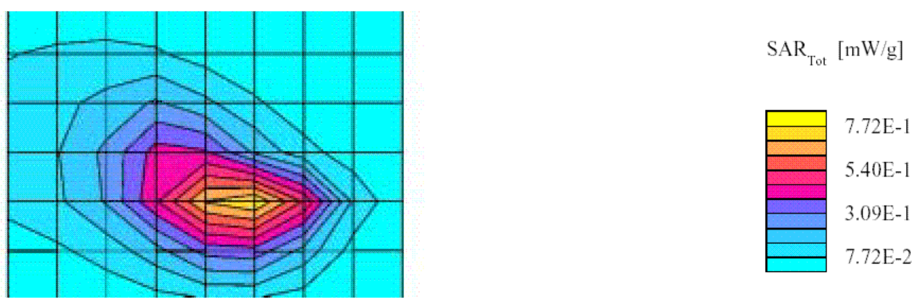
# GTran Wireless (IBM 1161, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.700 mW/g, SAR (10g): 0.393 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.00 dB



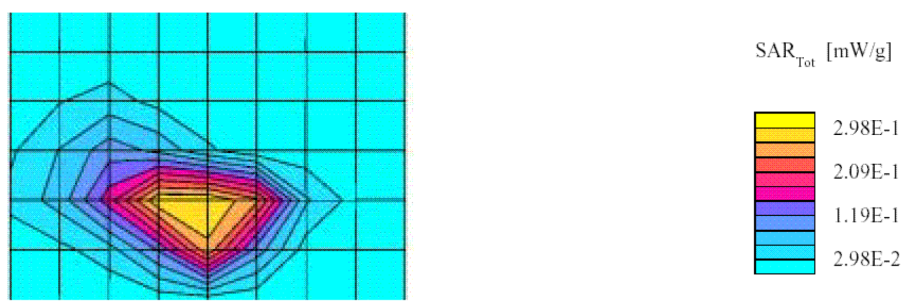
## GTran Wireless (IBM 1161, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 845 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.701 mW/g, SAR (10g): 0.393 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: -0.01 dB



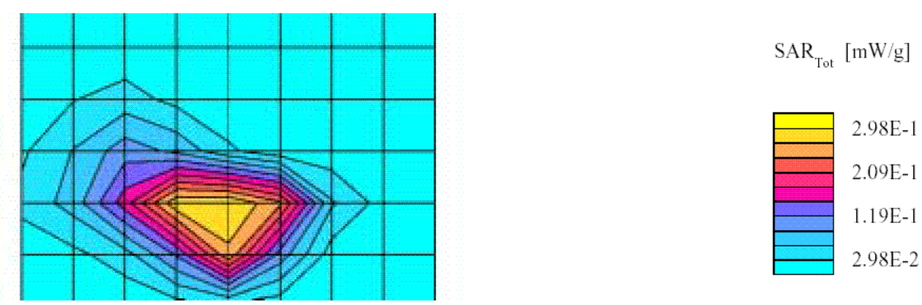
# GTran Wireless (IBM 1161, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.47$ mho/m $\varepsilon_r = 53.6$ $\rho = 1.00$ g/cm³
Cube 5x5x7: SAR (1g): 0.476 mW/g, SAR (10g): 0.212 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.01 dB



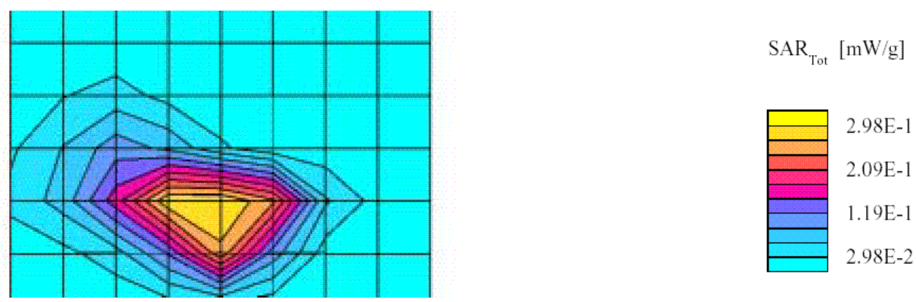
## GTran Wireless (IBM 1161, 24 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.475 mW/g, SAR (10g): 0.211 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.03 dB



# GTran Wireless (IBM 1161, 24 Deg, 10/4/02)

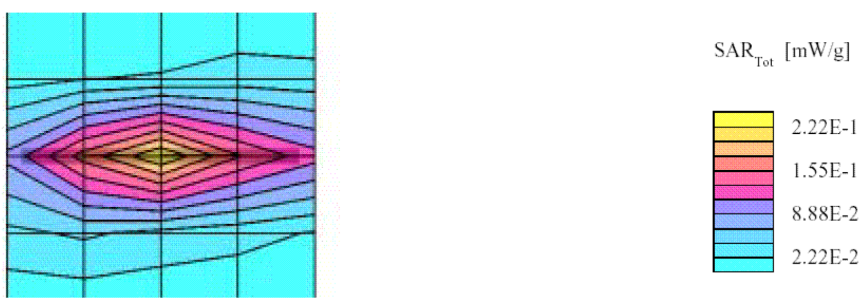
SAM Phantom; Section; Position: ; Frequency: 1905 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.478 mW/g, SAR (10g): 0.212 mW/g, (Worst-case extrapolation)
Coarse: Dx = 16.0, Dy = 16.0, Dz = 14.0
Powerdrift: 0.05 dB



# APPENDIX G - PLOTS OF SAR TEST DATA FOR DIPOLE VALIDATION AT 835MHZ AND 1900MHZ

## Validation 835MHz

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 835 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.178 mW/g, SAR (10g): 0.0840 mW/g, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.05 dB



## Dipole 1900 MHz

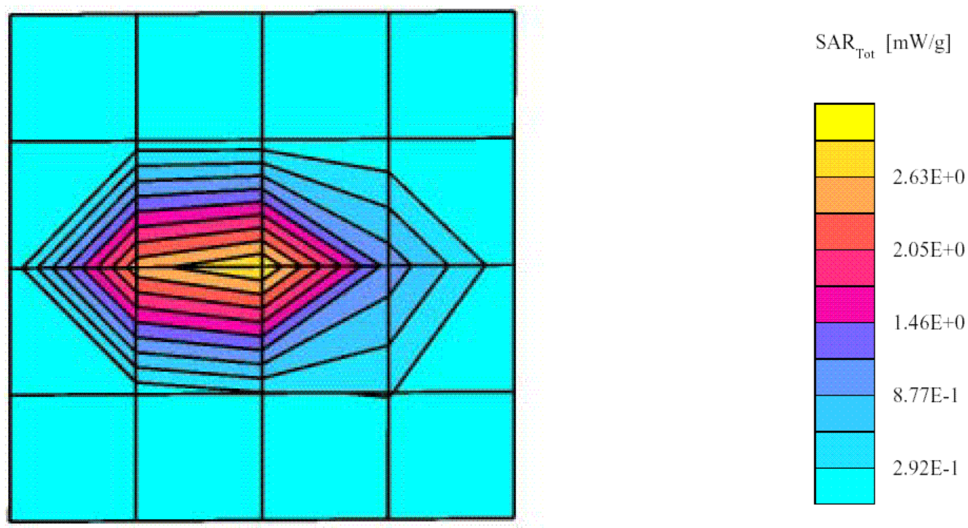
SAM;

Probe: ET3DV6 - SN1604; ConvF(7.31,7.31,7.31); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³

Cubes (2): Peak: 7.06 mW/g ± 0.00 dB, SAR (1g): 3.47 mW/g ± 0.01 dB, SAR (10g): 1.65 mW/g ± 0.02 dB, (Worst-case extrapolation)

Penetration depth: 7.7 (7.1, 9.1) [mm]

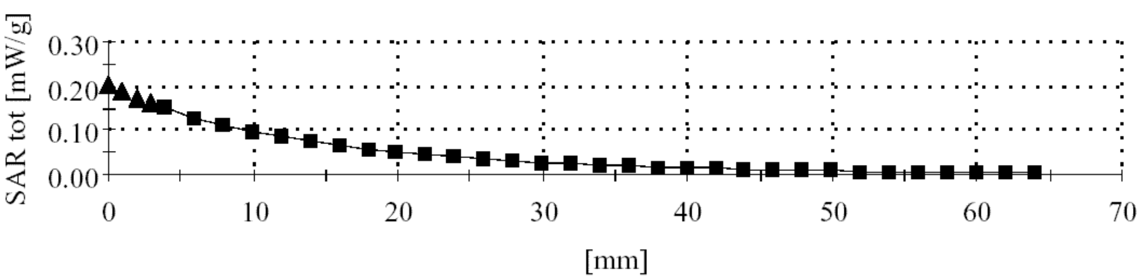
Powerdrift: -0.15 dB



# APPENDIX H - PLOTS OF SAR TEST DATA FOR Z-AXIS AT 835MHZ AND 1900MHZ

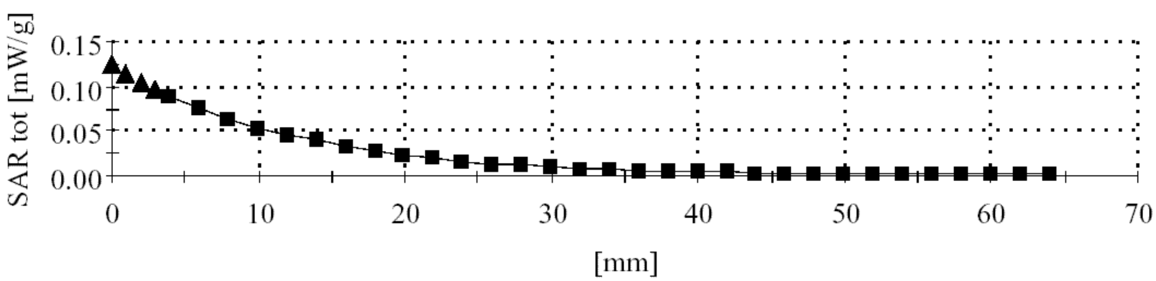
## GTran Wireless (HP T18.033.C.00, 22 Deg, 10/4/02)

SAM Phantom; Section; Position: ; Frequency: 825 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 835 MHz: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.9 $\rho$ = 1.00 g/cm³
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 2.0

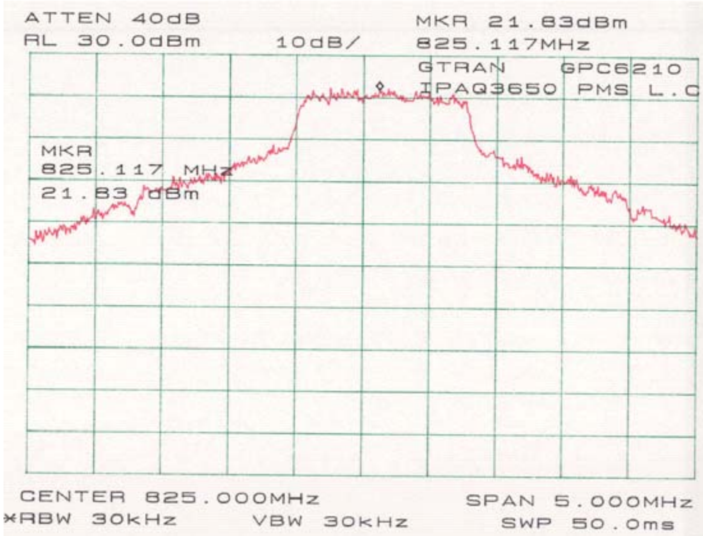


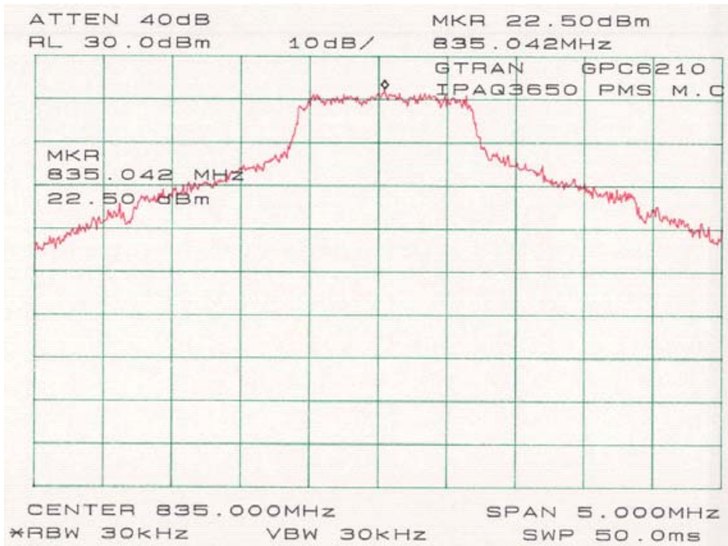
# GTran Wireless (Compaq ipaq 3870, 24 Deg, 10/4/02)

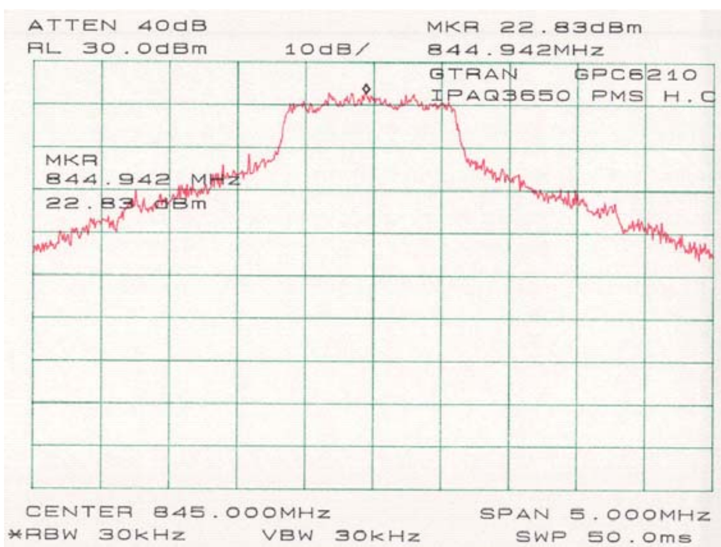
SAM Phantom; Section; Position: ; Frequency: 1850 MHz
Probe: ET3DV6 - SN1604; ConvF(6.77,6.77,6.77); Crest factor: 1.0; Body 1900 MHz: $\sigma$ = 1.47 mho/m $\varepsilon_r$ = 53.6 $\rho$ = 1.00 g/cm³
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 2.0



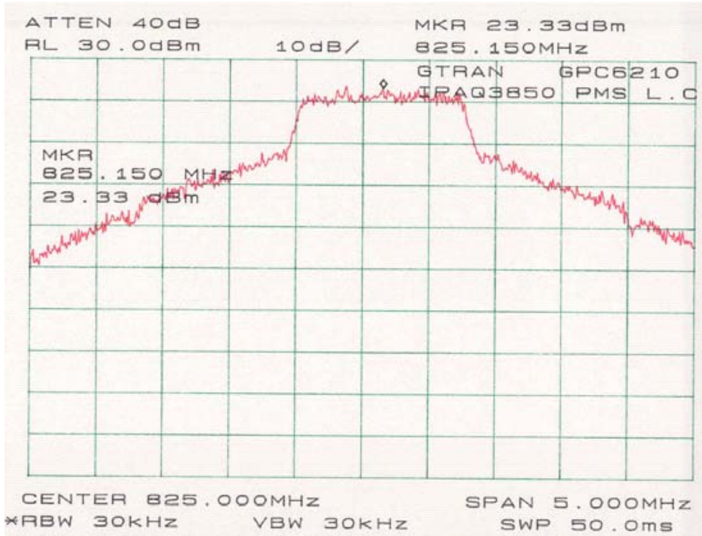
# APPENDIX I - PLOTS OF OUTPUT POWER FOR COMPAQ IPAQ 3650

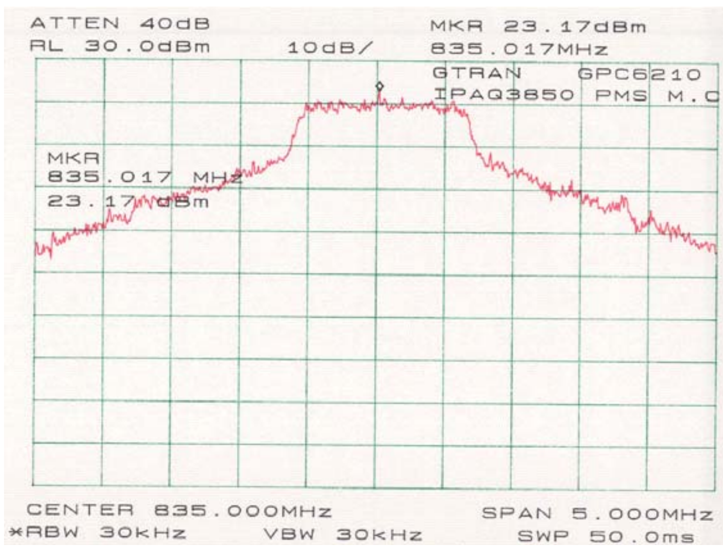


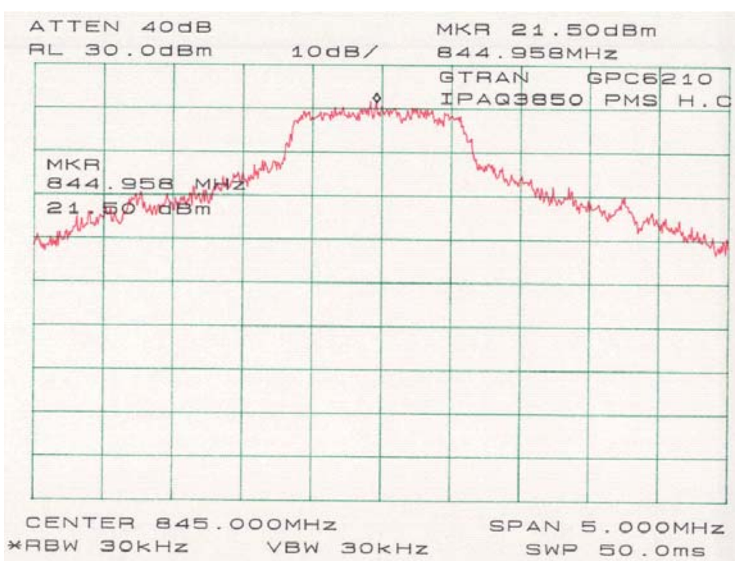



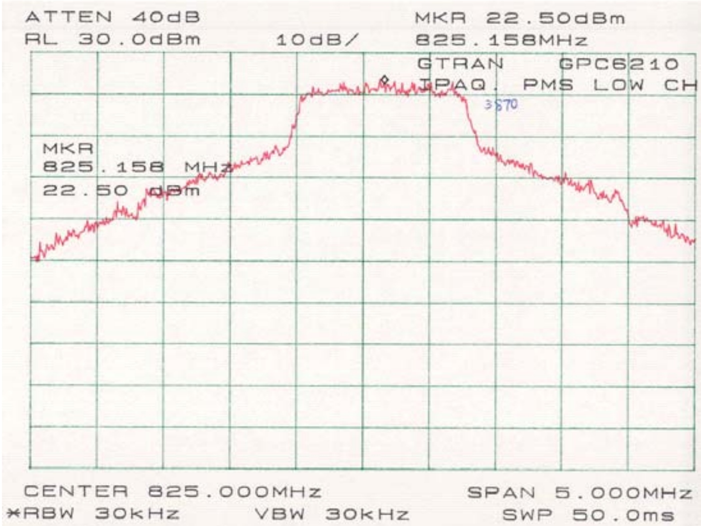
# APPENDIX J - PLOTS OF OUTPUT POWER FOR COMPAQ IPAQ 3850

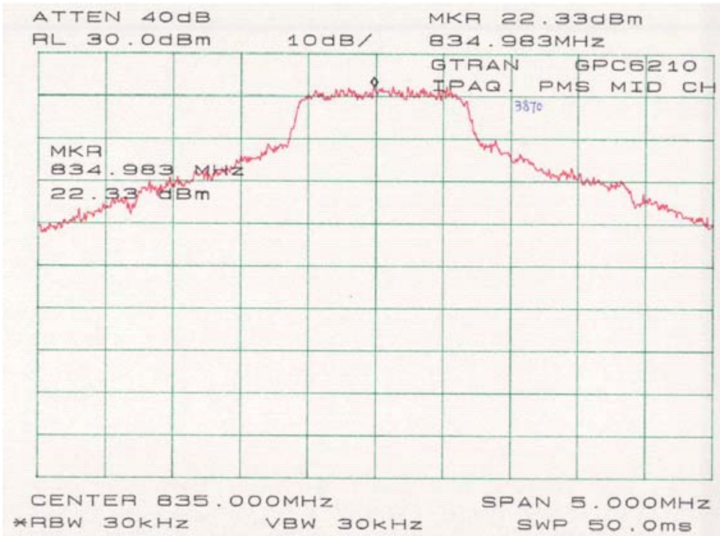


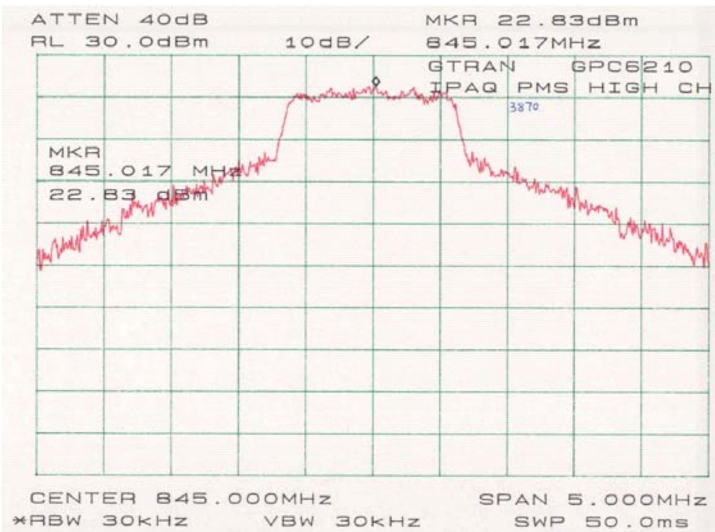



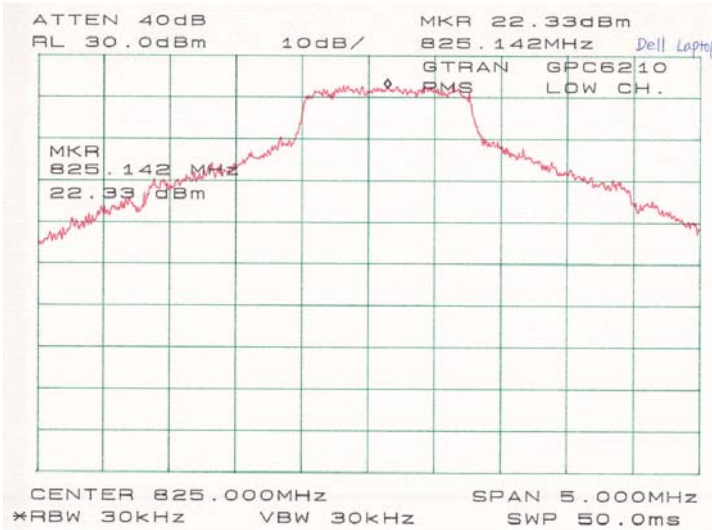
# APPENDIX K - PLOTS OF OUTPUT POWER FOR COMPAQ IPAQ 3870

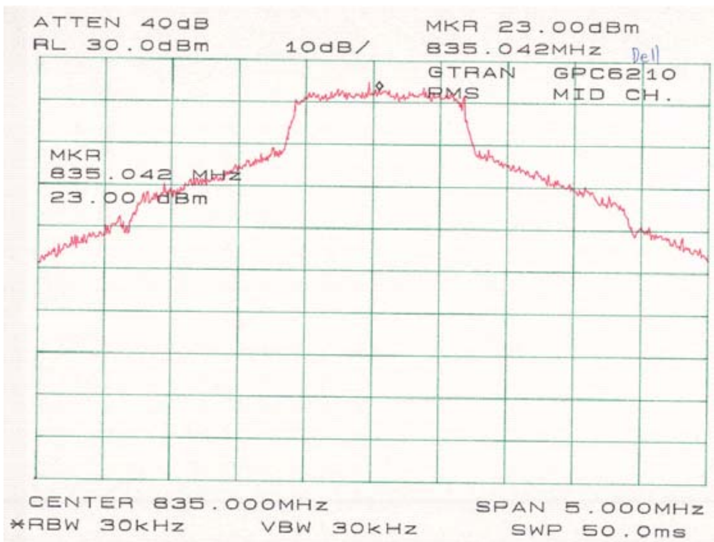


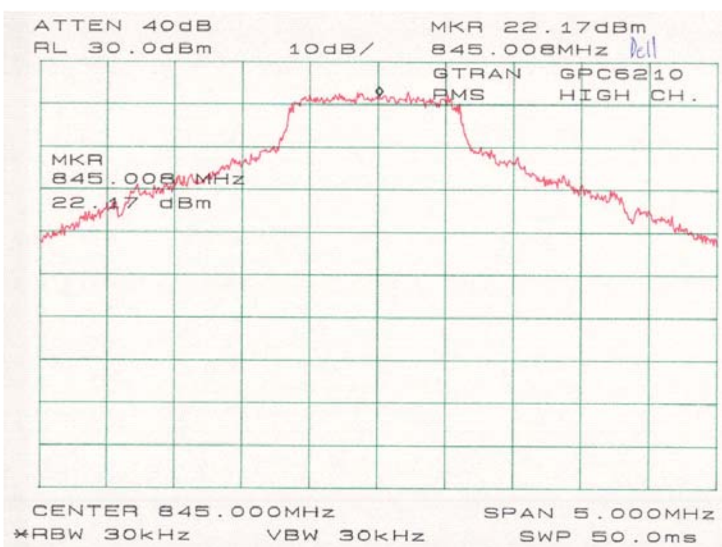



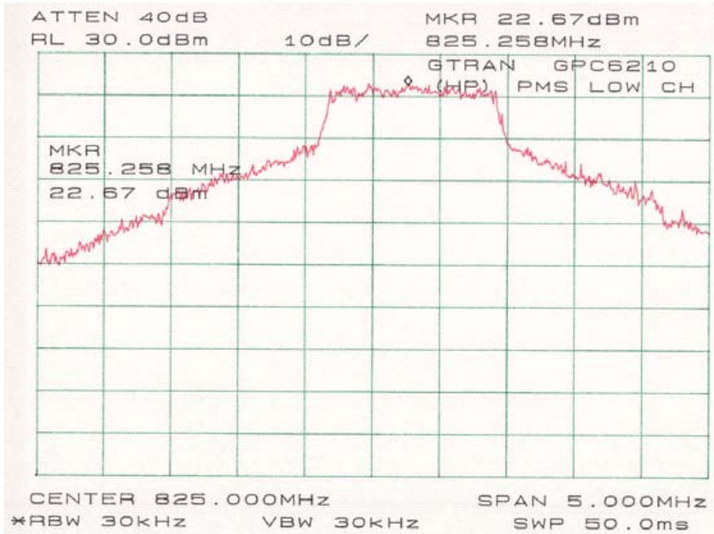
# APPENDIX L - PLOTS OF OUTPUT POWER FOR DELL PPO1L

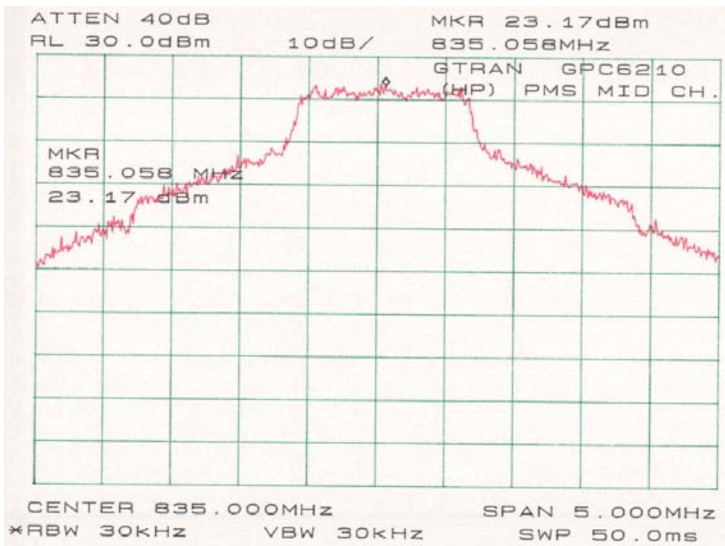


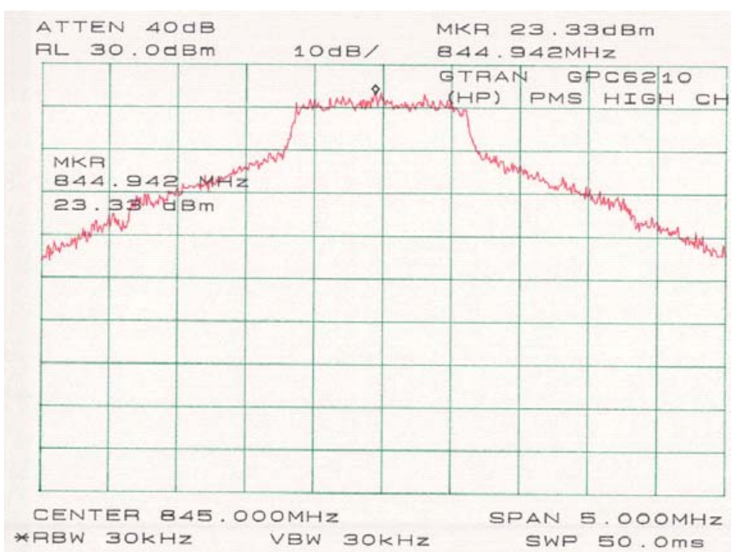



# APPENDIX M - PLOTS OF OUTPUT POWER FOR HP T18.033.C.00



# APPENDIX N - PLOTS OF OUTPUT POWER FOR IBM 1161