**1900MHZ Body Liquid validation 3/30/2004**
**Ambient Temp=23°C, Liquid Temp=22°C**

| Frequency | e' | e" |
|---|---|---|
| 1850000000.0000 | 52.4321 | 13.9473 |
| 1852000000.0000 | 52.4198 | 13.9852 |
| 1854000000.0000 | 52.4436 | 14.0622 |
| 1856000000.0000 | 52.4452 | 14.0960 |
| 1858000000.0000 | 52.4475 | 14.1686 |
| 1860000000.0000 | 52.4495 | 14.1941 |
| 1862000000.0000 | 52.4737 | 14.2514 |
| 1864000000.0000 | 52.4854 | 14.3110 |
| 1866000000.0000 | 52.5256 | 14.3295 |
| 1868000000.0000 | 52.5089 | 14.3746 |
| 1870000000.0000 | 52.5152 | 14.4023 |
| 1872000000.0000 | 52.5087 | 14.4487 |
| 1874000000.0000 | 52.5153 | 14.5041 |
| 1876000000.0000 | 52.5486 | 14.5170 |
| 1878000000.0000 | 52.5552 | 14.5528 |
| 1880000000.0000 | 52.5644 | 14.5406 |
| 1882000000.0000 | 52.5312 | 14.5625 |
| 1884000000.0000 | 52.5472 | 14.5685 |
| 1886000000.0000 | 52.5362 | 14.5780 |
| 1888000000.0000 | 52.5388 | 14.5637 |
| 1890000000.0000 | 52.5166 | 14.5736 |
| 1892000000.0000 | 52.5048 | 14.5603 |
| 1894000000.0000 | 52.4533 | 14.5008 |
| 1896000000.0000 | 52.4694 | 14.4789 |
| 1898000000.0000 | 52.4183 | 14.4554 |
| 1900000000.0000 | 52.3974 | 14.4358 |
| 1902000000.0000 | 52.3991 | 14.3989 |
| 1904000000.0000 | 52.3759 | 14.3507 |
| 1906000000.0000 | 52.3245 | 14.3322 |
| 1908000000.0000 | 52.3413 | 14.2730 |
| 1910000000.0000 | 52.2964 | 14.2455 |
| 1912000000.0000 | 52.2410 | 14.1974 |
| 1914000000.0000 | 52.2327 | 14.1917 |
| 1916000000.0000 | 52.2246 | 14.1055 |
| 1918000000.0000 | 52.1892 | 14.0683 |
| 1920000000.0000 | 52.1607 | 14.0249 |
| 1922000000.0000 | 52.1507 | 14.0181 |
| 1924000000.0000 | 52.1320 | 13.9921 |
| 1926000000.0000 | 52.0671 | 13.9435 |
| 1928000000.0000 | 52.0776 | 13.9341 |
| 1930000000.0000 | 52.0707 | 13.9107 |
| 1932000000.0000 | 52.0146 | 13.8654 |
| 1934000000.0000 | 52.0228 | 13.8916 |
| 1936000000.0000 | 52.0097 | 13.8456 |
| 1938000000.0000 | 51.9800 | 13.8732 |
| 1940000000.0000 | 52.0174 | 13.8551 |
| 1942000000.0000 | 51.9879 | 13.8987 |
| 1944000000.0000 | 51.9617 | 13.8968 |
| 1946000000.0000 | 51.9704 | 13.9388 |
| 1948000000.0000 | 51.9409 | 13.9664 |
| 1950000000.0000 | 51.9493 | 13.9764 |

$\sigma = \omega \varepsilon_o \varepsilon'' = 2 \pi f \varepsilon_o \varepsilon''=1.5259$
*where* $f = 835x 10^6$
$\varepsilon_o = 8.854 \times 10^{-12}$
$\varepsilon'' = 14.4358$

**1900MHZ Head Liquid validation 3/30/2004**
**Ambient Temp=23$^o$C  Liquid Temp=22$^o$C**

| frequency | e' | e'' |
|---|---|---|
| 1850000000.0000 | 38.9805 | 13.0699 |
| 1852000000.0000 | 38.9574 | 13.0555 |
| 1854000000.0000 | 38.9555 | 13.0547 |
| 1856000000.0000 | 38.9546 | 13.0438 |
| 1858000000.0000 | 38.9539 | 13.0195 |
| 1860000000.0000 | 38.9525 | 13.0238 |
| 1862000000.0000 | 38.9507 | 13.0138 |
| 1864000000.0000 | 38.9435 | 12.9969 |
| 1866000000.0000 | 38.9214 | 12.9617 |
| 1868000000.0000 | 38.9265 | 12.9629 |
| 1870000000.0000 | 38.9099 | 12.9564 |
| 1872000000.0000 | 38.8739 | 12.9760 |
| 1874000000.0000 | 38.8743 | 12.9403 |
| 1876000000.0000 | 38.8762 | 12.9188 |
| 1878000000.0000 | 38.8515 | 12.9395 |
| 1880000000.0000 | 38.8689 | 12.9307 |
| 1882000000.0000 | 38.8213 | 12.9295 |
| 1884000000.0000 | 38.7884 | 12.9214 |
| 1886000000.0000 | 38.7872 | 12.9331 |
| 1888000000.0000 | 38.7799 | 12.9777 |
| 1890000000.0000 | 38.7709 | 12.9398 |
| 1892000000.0000 | 38.7425 | 12.9460 |
| 1894000000.0000 | 38.7360 | 12.9696 |
| 1896000000.0000 | 38.7205 | 12.9576 |
| 1898000000.0000 | 38.6673 | 12.9920 |
| 1900000000.0000 | 38.6559 | 12.9817 |
| 1902000000.0000 | 38.6392 | 12.9834 |
| 1904000000.0000 | 38.6022 | 13.0248 |
| 1906000000.0000 | 38.6019 | 13.0156 |
| 1908000000.0000 | 38.5642 | 13.0222 |
| 1910000000.0000 | 38.5790 | 13.0587 |
| 1912000000.0000 | 38.5559 | 13.0584 |
| 1914000000.0000 | 38.5003 | 13.0799 |
| 1916000000.0000 | 38.5287 | 13.1355 |
| 1918000000.0000 | 38.5077 | 13.1285 |
| 1920000000.0000 | 38.5017 | 13.1545 |
| 1922000000.0000 | 37.4882 | 13.1716 |
| 1924000000.0000 | 37.4952 | 13.1919 |
| 1926000000.0000 | 37.4908 | 13.2166 |
| 1928000000.0000 | 37.4531 | 13.2438 |
| 1930000000.0000 | 37.4568 | 13.2416 |
| 1932000000.0000 | 37.4362 | 13.2648 |
| 1934000000.0000 | 37.4359 | 13.2759 |
| 1936000000.0000 | 37.4288 | 13.3031 |
| 1938000000.0000 | 37.4237 | 13.3386 |
| 1940000000.0000 | 37.4500 | 13.3328 |
| 1942000000.0000 | 37.4271 | 13.3225 |
| 1944000000.0000 | 37.4450 | 13.3489 |
| 1946000000.0000 | 37.4401 | 13.3844 |
| 1948000000.0000 | 37.4341 | 13.3701 |
| 1950000000.0000 | 37.4631 | 13.3973 |

$\sigma = \omega\, \varepsilon_o\, \varepsilon'' = 2\,\pi f\, \varepsilon_o\, \varepsilon''=1.3722$
*where* $f = 835x\ 10^6$
$\varepsilon_o = 8.854 \times 10^{-12}$
$\varepsilon'' = 12.9817$

# 3 - EUT DESCRIPTION

| | |
|---|---|
| Applicant: | CyberNet Inc |
| Product Description: | Wireless POS Terminal |
| Product Model Number: | JadeAIRE CDMA |
| FCC ID: | RXT-JADE-AI-CNN01 |
| Serial Number: | DM04010002 |
| Maximum RF Output Power: | 25.17dBm |
| RF Exposure environment: | General Population/Uncontrolled |
| Applicable Standard | FCC CFR 47, Part 22, Part 24 |
| Application Type: | Certification |

# 4 - SYSTEM TEST CONFIGURATION

## 4.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

## 4.2 EUT Exercise Procedure

The EUT exercising program used during SAR testing was designed to exercise the various system components in a manner similar to a typical use.

## 4.3 Equipment Modifications

No modification(s) were made to ensure that the EUT complies with the applicable limits.

# 5 – CONDUCTED OUTPUT POWER MEASUREMENTS

## 5.1 Provision Applicable

According to FCC §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts. According to FCC § 24.232(b), EIRP peak power for mobile/portable stations are limited to 2 watts.

## 5.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

## 5.3 Test equipment

Hewlett Packard HP8564E Spectrum Analyzer, Calibration Due Date: 2004-08-25.
Hewlett Packard HP 7470A Plotter, Calibration not required.
A.H. Systems SAS200 Horn Antenna, Calibration Due Date: 2004-08-01
Com-Power AD-100 Dipole Antenna, Calibration Due Date: 2004-09-26

## 5.4 Test Results

800 MHz

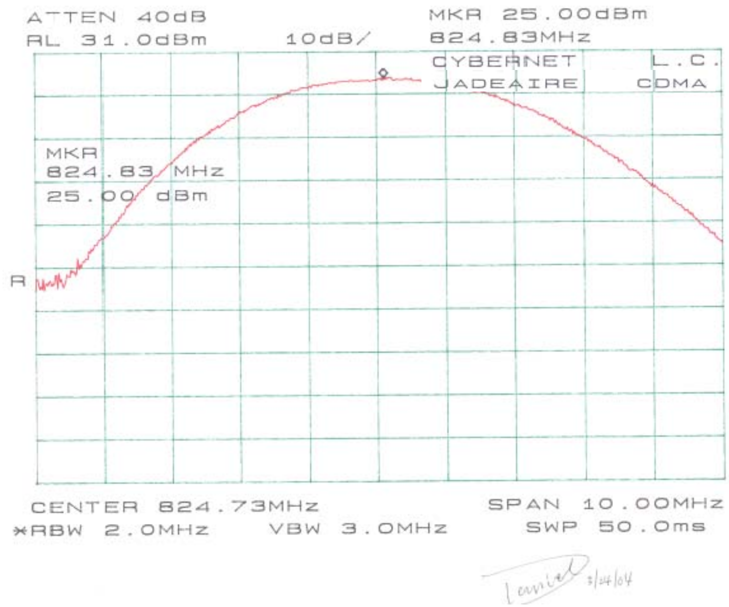
| Modulation Type | Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit (W) |
|---|---|---|---|---|---|
| CDMA | Low | 824.73 | 25.00 | 0.316 | 7 |
| | Middle | 836.43 | 25.17 | 0.329 | 7 |
| | High | 848.24 | 24.83 | 0.304 | 7 |

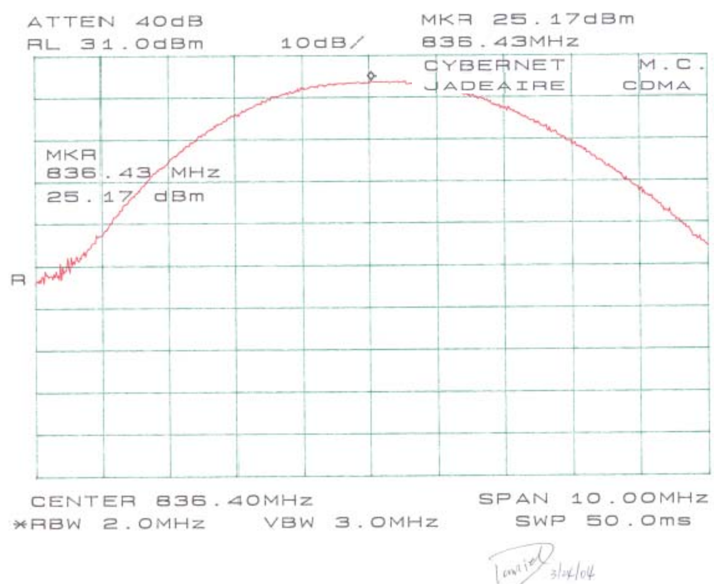
1900 MHz

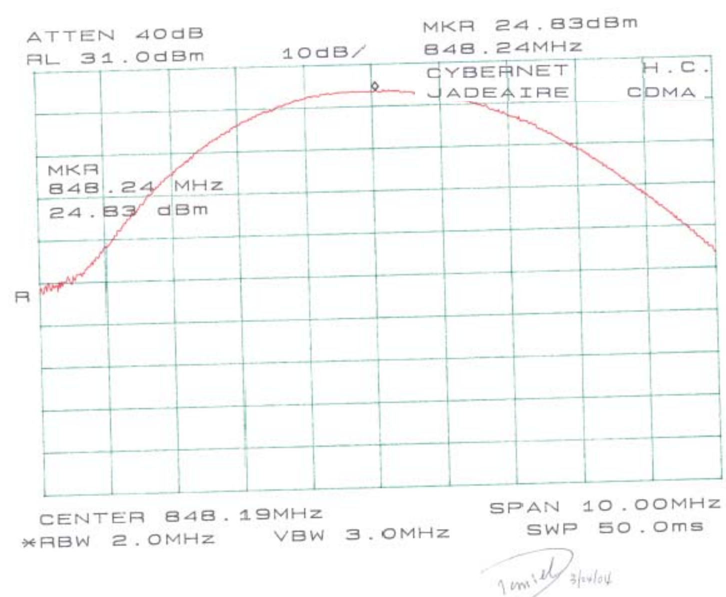
| Modulation Type | Channel | Frequency (MHz) | Output Power in dBm | Output Power in W | Limit (W) |
|---|---|---|---|---|---|
| CDMA | Low | 1851.12 | 24.67 | 0.293 | 7 |
| | Middle | 1879.87 | 24.83 | 0.304 | 7 |
| | High | 1908.53 | 24.83 | 0.304 | 7 |

Please refer to the following plots.

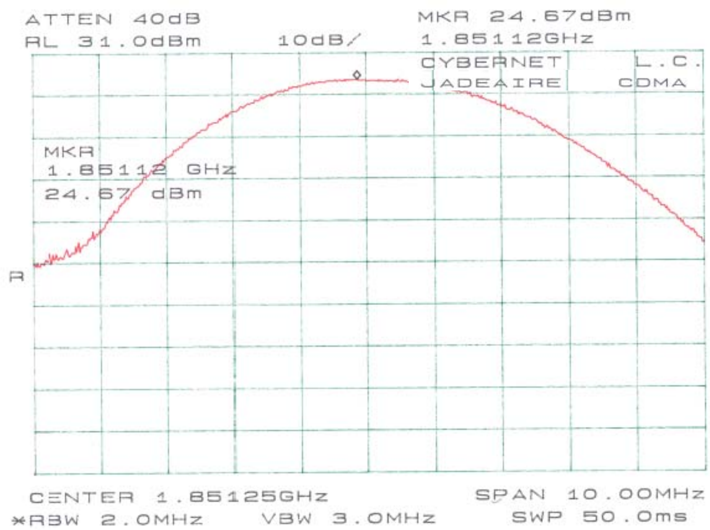
800MHz

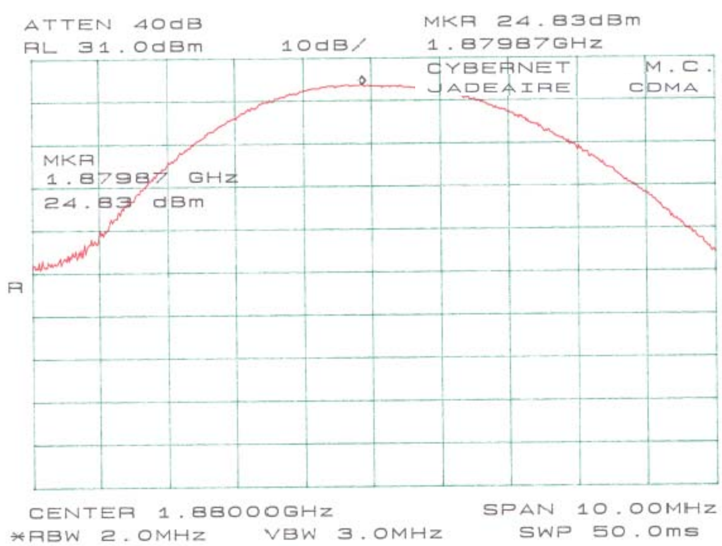

ATTEN 40dB
RL 31.0dBm
10dB/
MKR 25.00dBm
824.83MHz
CYBERNET
JADEAIRE
L.C.
CDMA
MKR
824.83 MHz
25.00 dBm
CENTER 824.73MHz
*RBW 2.0MHz
VBW 3.0MHz
SPAN 10.00MHz
SWP 50.0ms

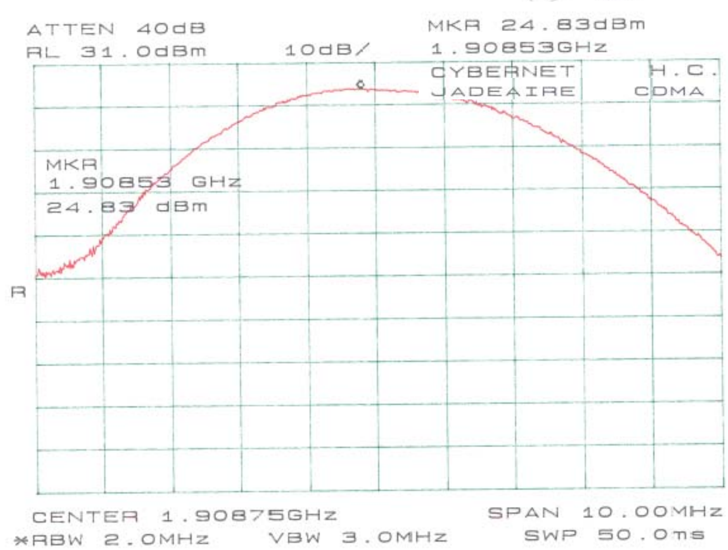

ATTEN 40dB
RL 31.0dBm
10dB/
MKR 25.17dBm
836.43MHz
CYBERNET
JADEAIRE
M.C.
CDMA
MKR
836.43 MHz
25.17 dBm
CENTER 836.40MHz
*RBW 2.0MHz
VBW 3.0MHz
SPAN 10.00MHz
SWP 50.0ms


ATTEN 40dB
RL 31.0dBm
10dB/
MKR 24.83dBm
848.24MHz
CYBERNET
JADEAIRE
H.C.
CDMA
MKR
848.24 MHz
24.83 dBm
CENTER 848.19MHz
*RBW 2.0MHz
VBW 3.0MHz
SPAN 10.00MHz
SWP 50.0ms

1900MHz


ATTEN 40dB
RL 31.0dBm
10dB/
MKR 24.67dBm
1.85112GHz
CYBERNET
JADEAIRE
L.C.
CDMA
MKR
1.85112 GHz
24.67 dBm
CENTER 1.85125GHz
SPAN 10.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms


ATTEN 40dB
RL 31.0dBm
10dB/
MKR 24.83dBm
1.87987GHz
CYBERNET
JADEAIRE
M.C.
CDMA
MKR
1.87987 GHz
24.83 dBm
CENTER 1.88000GHz
SPAN 10.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms


ATTEN 40dB
RL 31.0dBm
10dB/
MKR 24.83dBm
1.90853GHz
CYBERNET
JADEAIRE
H.C.
CDMA
MKR
1.90853 GHz
24.83 dBm
CENTER 1.90875GHz
SPAN 10.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms

# 6 - DOSIMETRIC ASSESSMENT SETUP

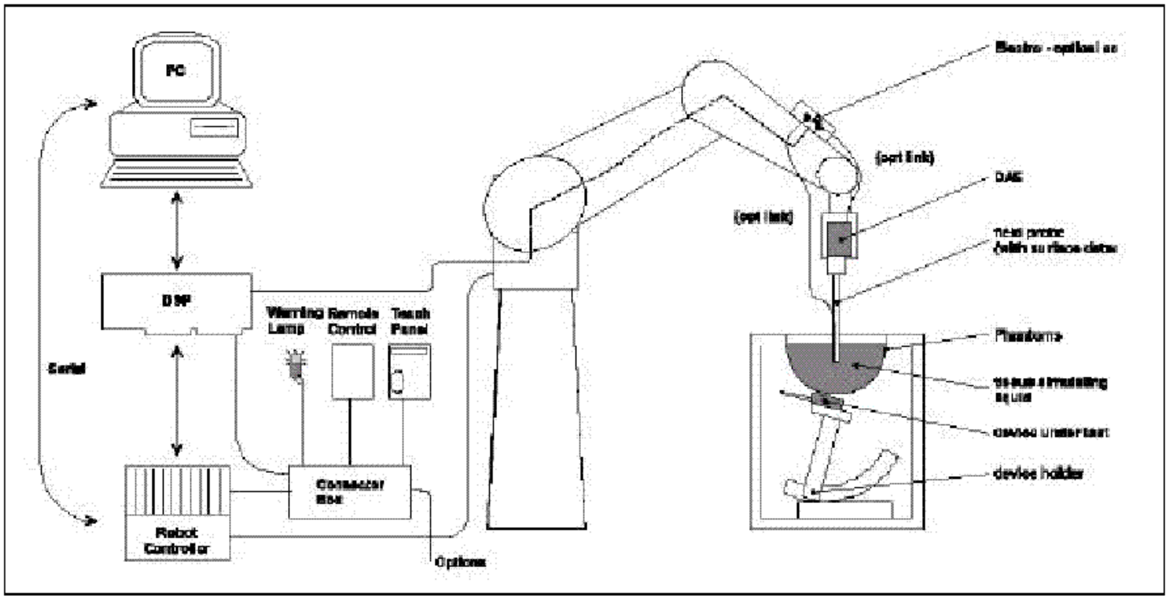
These measurements were performed with the automated near-field scanning system DASY3 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ±0.02mm. Special 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 | 56.8 | 39.9 | 54.0 | 39.8 | 52.5 |
| Conductivity (s/m) | 0.85 | 0.83 | 0.91 | 0.95 | 1.0 | 1.07 | 1.42 | 1.45 | 1.88 | 1.78 |

## 6.1 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.

## 6.2. System Components

**ES3DV2 Probe Specification**

**Photograph of the probe**

Construction: Symmetrical design with triangular core
Interleafed sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., glycol)

Calibration: In air from 10 MHz to 3 GHz
In brain and muscle simulating tissue at frequencies of 450 MHz, 900 MHz and 1.8 GHz (accuracy ± 8%)
Calibratin for other liquids and frequencies upon request

Frequency: 10 MHz to > 6GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)

Directivity: ± 0.2 dB in brain tissue (rotation around probe axis)
± 0.3 dB in brain tissue (rotation normal to probe axis)

Dynamic Range: 5μW/g to > 100 mW/g; Linearity: ± 0.2 dB

Dimensions: Overall length: 330 mm
Tip length: 20 mm
Body diameter: 12 mm
Tip diameter: 3.9 mm
Distance from probe tip to dipole centers: 2.7 mm

Application: General dosimetry up to 5 GHz
Dosimetry in strong gradient fields
Compliance tests of mobile phones

The SAR measurements were conducted with the dosimetric probe ET3DV2 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 ES3DV2 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.

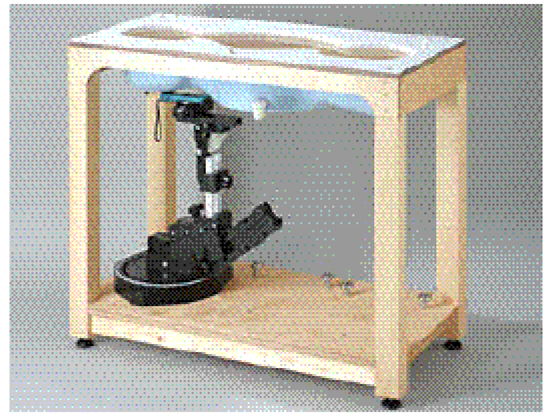
The power flow density is calculated assuming the excitation field as a free space field.

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

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)

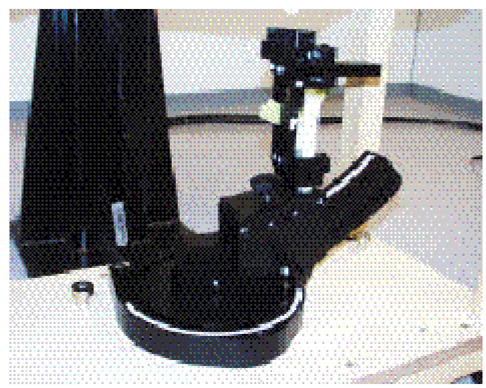


**Generic Twin Phantom**

**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**

## 6.3 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.

| **Measurement Uncertainty Analysis per IEEE P1528-2002** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Description | Section | Reported Variance (%) | Probability Distribution type | Divisor | Ci (1g) | Ui (1g) | Vi | welc/satt series term |
| | | | | | | | | |
| Probe Calibration | E.2.1 | 4.80 | N | 1 | 1 | 4.80 | 1.00E+09 | 5.30842E-07 |
| Axial isotropy | E.2.2 | 4.70 | R | 1.732 | 0.707107 | 1.92 | 1.00E+09 | 1.35563E-08 |
| Hemispherical isotropy | E.2.2 | 9.60 | R | 1.732 | 0.707107 | 3.92 | 1.00E+09 | 2.35957E-07 |
| Boundary effects | E.2.3 | 8.30 | R | 1.732 | 1 | 4.79 | 1.00E+09 | 5.27377E-07 |
| Linearity | E.2.4 | 4.70 | R | 1.732 | 1 | 2.71 | 1.00E+09 | 5.4225E-08 |
| System Detection Limit | E.2.5 | 1.00 | R | 1.732 | 1 | 0.58 | 1.00E+09 | 1.11124E-10 |
| Readout Electronics | E.2.6 | 0.00 | N | 1 | 1 | 0.00 | 1.00E+09 | 0 |
| Response time | E.2.7 | 0.00 | R | 1.732 | 1 | 0.00 | 1.00E+09 | 0 |
| Integration time | E.2.8 | 0.00 | R | 1.732 | 1 | 0.00 | 1.00E+09 | 0 |
| RF Ambient conditions | E.6.1 | 3.00 | R | 1.732 | 1 | 1.73 | 1.00E+09 | 9.00106E-09 |
| Probe positioning mechanical tolerance | E.6.2 | 0.40 | R | 1.732 | 1 | 0.23 | 1.00E+09 | 2.84478E-12 |
| Probe positioning wrt phantom shell | E.6.3 | 2.90 | R | 1.732 | 1 | 1.67 | 1.00E+09 | 7.8596E-09 |
| Extra/inter-polation & integration algorithmsfor max SAR evaluation | E.5.2 | 3.90 | R | 1.732 | 1 | 2.25 | 1.00E+09 | 2.57079E-08 |
| Test sample positioning | 8, E.4.2 | 6.00 | R | 1.732 | 1 | 3.46 | 1.00E+09 | 1.44017E-07 |
| Device holder distance tolerance | E.4.1 | 5.00 | N | 1 | 1 | 5.00 | 1.00E+09 | 0.000000625 |
| Output power and SAR drift measurement | 8, E.6.6.2 | 5.00 | R | 1.732 | 1 | 2.89 | 1.00E+09 | 6.94526E-08 |
| Phantom uncertainty, shell thickness tolerance | E.3.1 | 4.00 | R | 1.732 | 1 | 2.31 | 1.00E+09 | 2.84478E-08 |
| Liquid conductivity, deviation from target values | E.3.2 | 5.00 | R | 1.732 | 0.64 | 1.85 | 1.00E+09 | 1.16522E-08 |
| Liquid conductivity, measurement uncertainty | E.3.3 | 5.00 | N | 1 | 0.64 | 3.20 | 5 | 20.97152 |
| Liquid permitivity, deviation from target values | E.3.2 | 5.00 | R | 1.732 | 0.6 | 1.73 | 1.00E+09 | 9.00106E-09 |
| Liquid permitivity, measurement uncertainty | E.3.3 | 5.00 | N | 1 | 0.6 | 3.00 | 5 | 16.2 |
| | | | | | | | | |
| | | | | | | | | 689 |
| **Probe isotropy sensitivity coefficient** | **0.5** | | | | | | | |
| **Combined Standard Uncertainty** | | | | | | **12.65** | **%** | |
| **Expanded Uncertainty, 95% confidence** | | **k=** | **2.004** | | | **25.34** | **%** | |

# 7 - EVALUATION PROCEDURE

## 7.1 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.

## 7.2 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).*

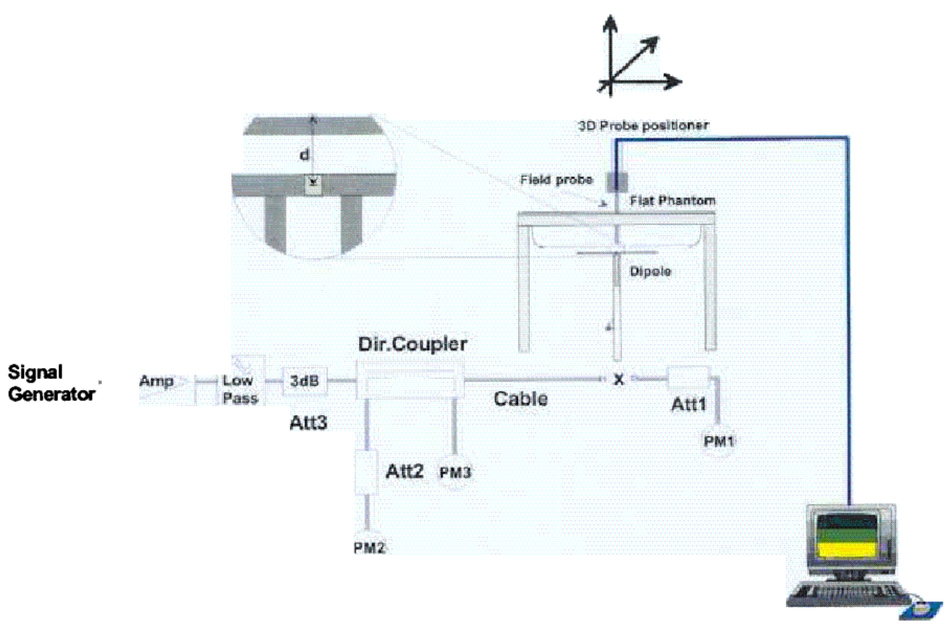
*Population/uncontrolled environments Partial-body limit 1.6W/kg applied to the EUT.*

## 7.3 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:

## 7.4 SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First, the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at he dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. after connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM 2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed form the previous value. The reflected power should be 20dB below the forward power.

The SAR measurements were performed in order to achieve repeatability and to establish an average target value.

## 7.5 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 for head**

| 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 |

**Validation Dipole SAR Reference Test Result for Body (835 MHz)**

| Validation Measurement | SAR @ 0.025W Input averaged over 1g | SAR @ 1W Input averaged over 1g | SAR @ 0.025W Input averaged over 10g | SAR @ 1W Input averaged over 10g |
|---|---|---|---|---|
| Test 1 | 0.222 | 8.88 | 0.112 | 4.48 |
| Test 2 | 0.221 | 8.84 | 0.111 | 4.44 |
| Test 3 | 0.222 | 8.88 | 0.112 | 4.48 |
| Test 4 | 0.220 | 8.80 | 0.111 | 4.44 |
| Test 5 | 0.223 | 8.92 | 0.113 | 4.52 |
| Test 6 | 0.222 | 8.88 | 0.115 | 4.60 |
| Test 7 | 0.221 | 8.84 | 0.114 | 4.56 |
| Test 8 | 0.222 | 8.88 | 0.114 | 4.56 |
| Test 9 | 0.223 | 8.92 | 0.113 | 4.52 |
| Test 10 | 0.222 | 8.88 | 0.112 | 4.48 |
| Average | 0.2218 | 8.872 | 0.1127 | 4.51 |

**Validation Dipole SAR Reference Test Result for Body (1900 MHz)**

| Validation Measurement | SAR @ 0.126W Input averaged over 1g | SAR @ 1W Input averaged over 1g | SAR @ 0.126W Input averaged over 10g | SAR @ 1W Input averaged over 10g |
|---|---|---|---|---|
| Test 1 | 3.1 | 24.61 | 1.42 | 11.27 |
| Test 2 | 3.1 | 24.61 | 1.41 | 11.20 |
| Test 3 | 3.2 | 25.41 | 1.43 | 11.35 |
| Test 4 | 3.2 | 25.41 | 1.42 | 11.27 |
| Test 5 | 3.1 | 24.61 | 1.42 | 11.27 |
| Test 6 | 3.2 | 25.61 | 1.41 | 11.20 |
| Test 7 | 3.2 | 25.61 | 1.43 | 11.35 |
| Test 8 | 3.1 | 24.61 | 1.42 | 11.27 |
| Test 9 | 3.1 | 24.61 | 1.42 | 11.27 |
| Test 10 | 3.1 | 24.61 | 1.43 | 11.35 |
| Average | 3.14 | 24.97 | 1.421 | 11.28 |

## 7.6 Liquid Measurement Result

2004-03-24

| Simulant | Freq [MHz] | Parameters | Liquid Temp [ºC] | Target Value | Measured Value | Deviation | Limits [%] |
|---|---|---|---|---|---|---|---|
| Body | 835 | $\varepsilon_r$ | 22.0 | 55.2 | 53.1 | -3.80 | ±5 |
| | | σ | 22.0 | 0.97 | 0.94 | -3.09 | ±5 |
| | | 1g SAR | 22.0 | 8.872 | 9.36 | 5.50 | ±10 |
| Head | 835 | $\varepsilon_r$ | 22.0 | 41.5 | 40.4 | -2.65 | ±5 |
| | | σ | 22.0 | 0.90 | 0.89 | -1.11 | ±5 |
| | | 1g SAR | 22.0 | 9.5 | 9.54 | 0.42 | ±10 |

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

Liquid Forward Power for body = 112.20 mW
Liquid Forward Power for head = 112.20 mW

2004-03-30

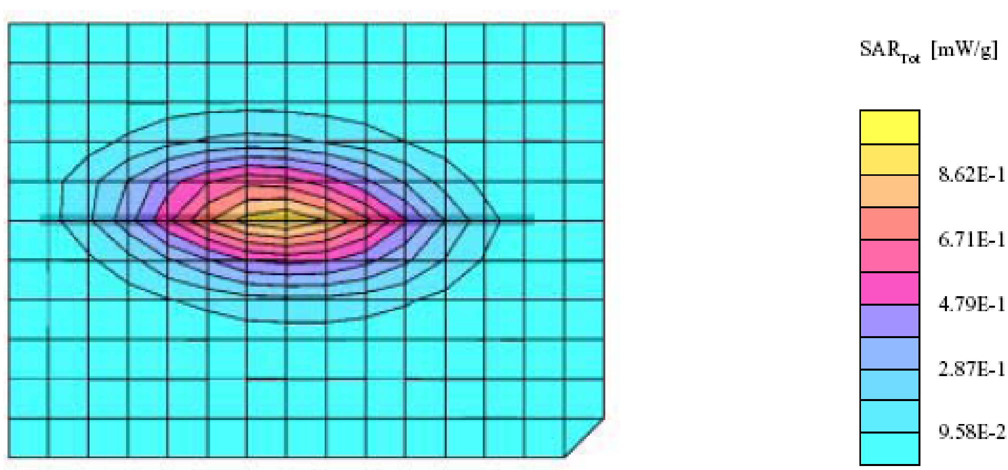
| Simulant | Freq [MHz] | Parameters | Liquid Temp [ºC] | Target Value | Measured Value | Deviation | Limits [%] |
|---|---|---|---|---|---|---|---|
| Body | 1900 | $\varepsilon_r$ | 22.0 | 53.3 | 52.4 | -1.69 | ±5 |
| | | σ | 22.0 | 1.52 | 1.53 | 0.66 | ±5 |
| | | 1g SAR | 22.0 | 24.97 | 24.08 | -3.56 | ±10 |
| Head | 1900 | $\varepsilon_r$ | 22.0 | 40.0 | 38.7 | -3.25 | ±5 |
| | | σ | 22.0 | 1.40 | 1.37 | -2.14 | ±5 |
| | | 1g SAR | 22.0 | 39.7 | 37.80 | -4.79 | ±10 |

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

Liquid Forward Power for body = 107.15 mW
Liquid Forward Power for head = 107.15 mW

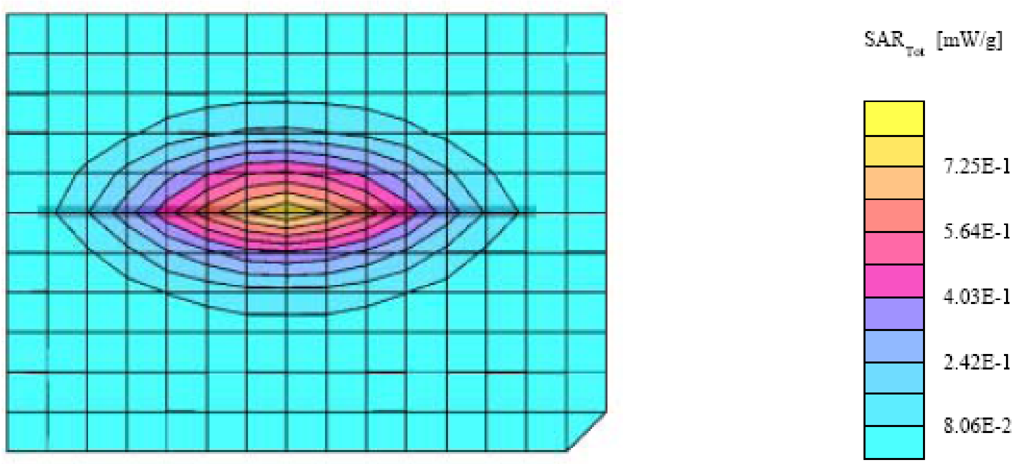
System Validation 835 MHz Body liquid (Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, Forward Power = 20.5 dBm, 03/24/2004)

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 835 MHz
Probe: ES3DV2 - SN3019; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 835 (Body) MHz: $\sigma$ = 0.94 mho/m $\varepsilon_r$ = 53.1 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 1.05 mW/g, SAR (10g): 0.580 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: 0.00 dB



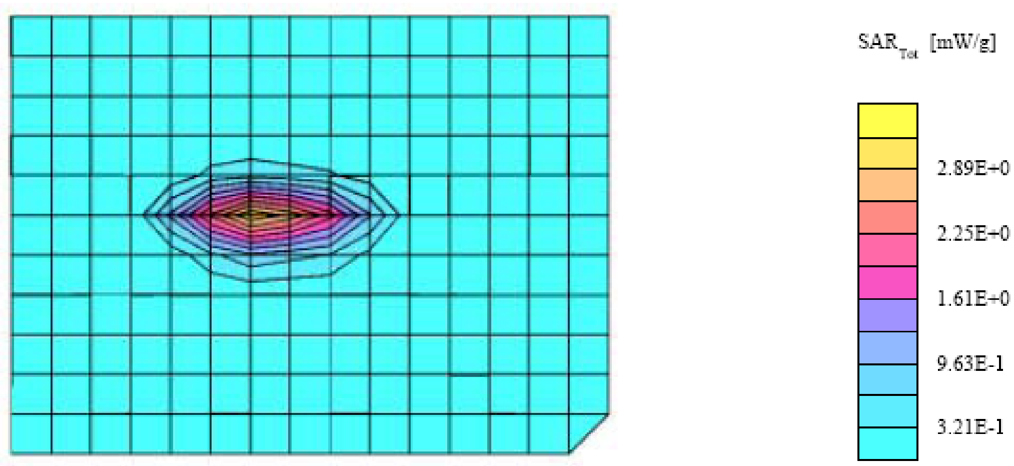
System Validation 835 MHz Head liquid (Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, Forward Power=20.5 dBm , 03/24/2004)

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 835 MHz
Probe: ES3DV2 - SN3019; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 (Head) MHz: $\sigma$ = 0.89 mho/m $\varepsilon_r$ = 40.4 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 1.07 mW/g, SAR (10g): 0.618 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: -0.00 dB



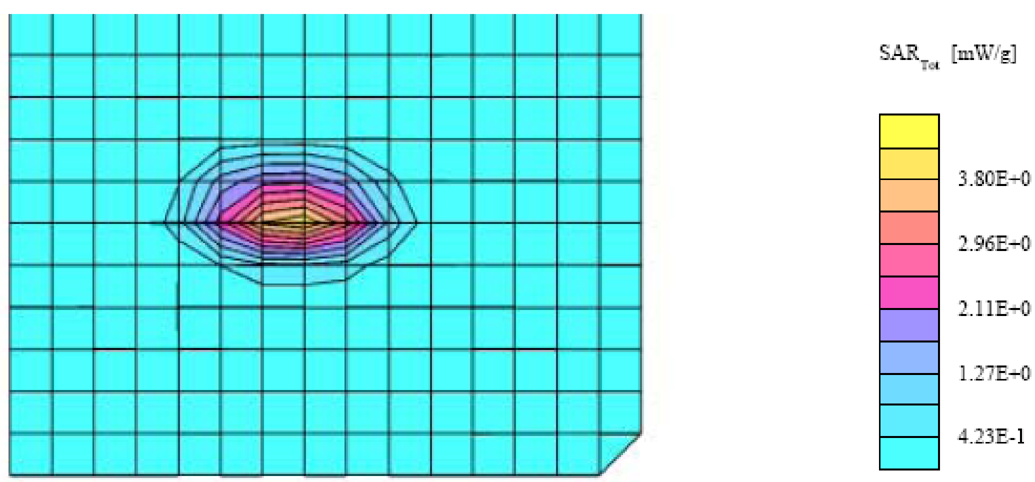
1900 MHz Body Liquid System Validation (Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, Forwar Power = 20.3 dBm, 3/30/2004)

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1900 MHz
Probe: ES3DV2 - SN3019; ConvF(4.60,4.60,4.60); Crest factor: 1.0; Body1900 MHz: $\sigma$ = 1.53 mho/m $\varepsilon_r$ = 52.4 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 2.58 mW/g, SAR (10g): 1.14 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: -0.01 dB



1900 MHz Head Liquid System Validation (Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, Forwar Power = 20.3 dBm, 3/30/2004)

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1900 MHz
Probe: ES3DV2 - SN3019; ConvF(4.70,4.70,4.70); Crest factor: 1.0; Head 1900 MHz: $\sigma$ = 1.37 mho/m $\varepsilon_r$ = 38.7 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 4.05 mW/g, SAR (10g): 1.82 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: -0.00 dB



# 8 - SAR 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.

## 8.1 SAR Body and Head Worst-Case Test Data

2004-03-24

Ambient Temperature (ºC): 19.0
Relative Humidity (%): 60

2004-03-30

Ambient Temperature (ºC): 23.0
Relative Humidity (%): 49

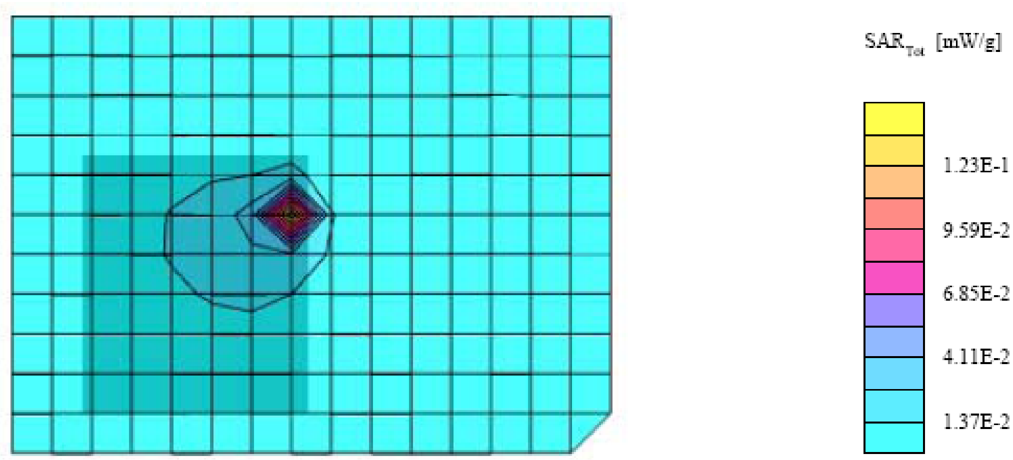
| Position | Frequency (MHz) | Output Power (dBm) | Test Type | Liquid | Phantom | Notes / Accessories | Measured (mW/g) | Limit (mW/g) | Plot # |
|---|---|---|---|---|---|---|---|---|---|
| Back Side Touching | 836 | 25.17 | Body worn | Body | Flat | None | 0.0897 | 1.6 | 1 |
| Bottom Side Touching | 836 | 25.17 | Body worn | Body | Flat | None | 0.111 | 1.6 | 2 |
| Right Side Touching | 836 | 25.17 | Body worn | Body | Flat | None | 0.217 | 1.6 | 3 |
| Back Side Touching | 1880 | 24.83 | Body worn | Body | Flat | None | 0.0313 | 1.6 | 4 |
| Bottom Side Touching | 1880 | 24.83 | Body worn | Body | Flat | None | 0.140 | 1.6 | 5 |
| Right Side Touching | 1880 | 24.83 | Body worn | Body | Flat | None | 0.232 | 1.6 | 6 |

## 8.2 Plots of Test Result

The plots of test result were attached as reference.

Cybernet, JADEAIRE CDMA (Back side in touch to the flat phantom, Ambient Temp = 23 C, Liquid Temp = 22 C, Mid Channel, 3/24/2004)

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 836 MHz
Probe: ET3DV2 - SN3019; ConvF(6.10,6.10,6.10); Crest factor: 1.0; Body Liquid 835MHZ: $\sigma$ = 0.94 mho/m $\varepsilon_r$ = 53.1 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.0897 mW/g, SAR (10g): 0.0246 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: 0.00 dB




Plot #1

Cybernet, JADEAIRE CDMA (Bottom side in touch to the flat phantom, Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, Mid Channel, 3/24/2004)

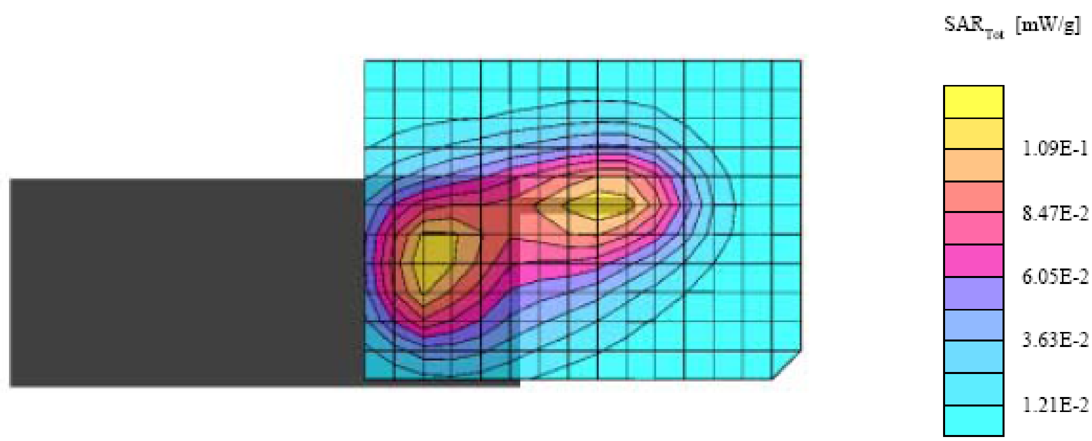
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 836 MHz

Probe: ES3DV2 - SN3019; ConvF(6.10,6.10,6.10); Crest factor: 1.0; Body Liquid 835MHz: $\sigma$ = 0.94 mho/m $\varepsilon_r$ = 53.1 $\rho$ = 1.00 g/cm³

Cube 5x5x7: SAR (1g): 0.111 mW/g, SAR (10g): 0.0729 mW/g, (Worst-case extrapolation)

Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0

Powerdrift: -0.01 dB




Plot #2

Cybernet,JADEAIRE CDMA (Right side in touch to the flat phantom, Ambient Temp = 23 C, Liquid Temp = 22 C, Mid Channel, 3/24/2004)

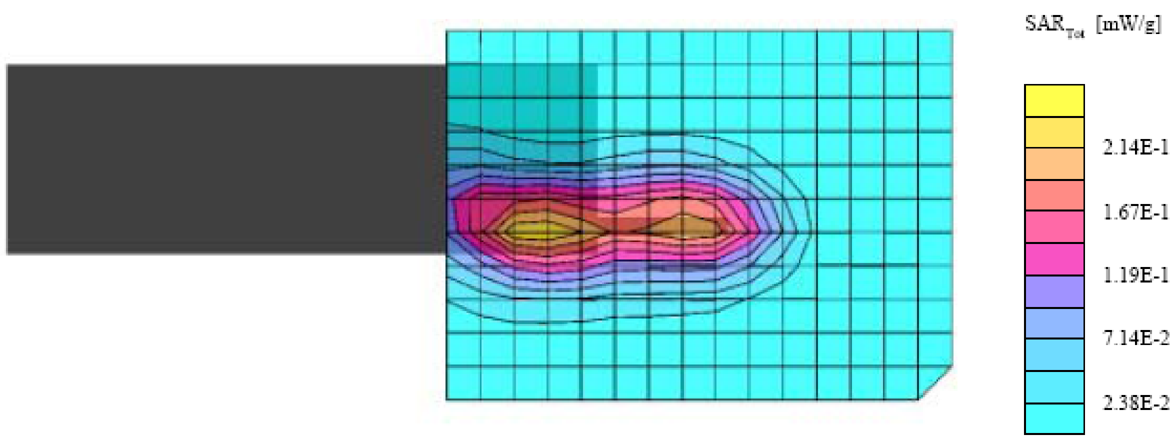
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 836 MHz

Probe: ES3DV2 - SN3019; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 835 MHz: $\sigma$ = 0.94 mho/m $\varepsilon_r$ = 53.1 $\rho$ = 1.00 g/cm³

Cube 5x5x7: SAR (1g): 0.217 mW/g, SAR (10g): 0.133 mW/g, (Worst-case extrapolation)

Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0

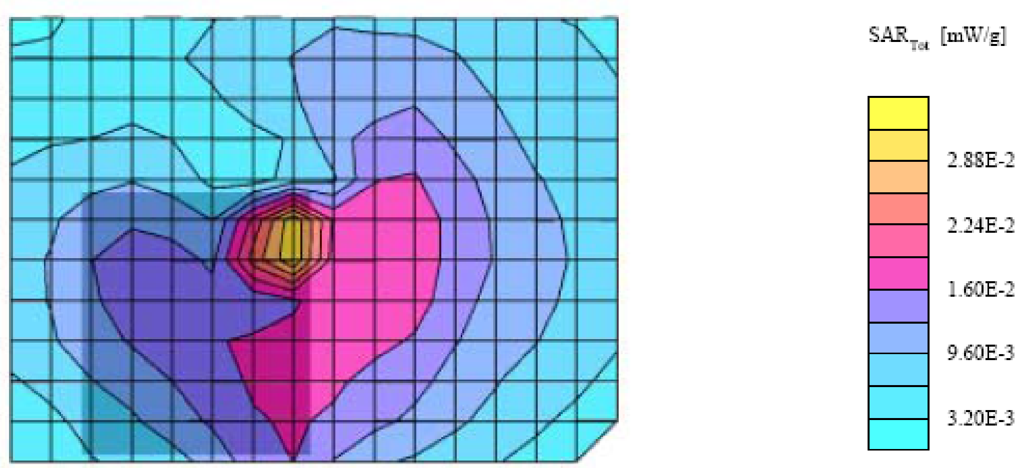
Powerdrift: 0.00 dB




Plot #3

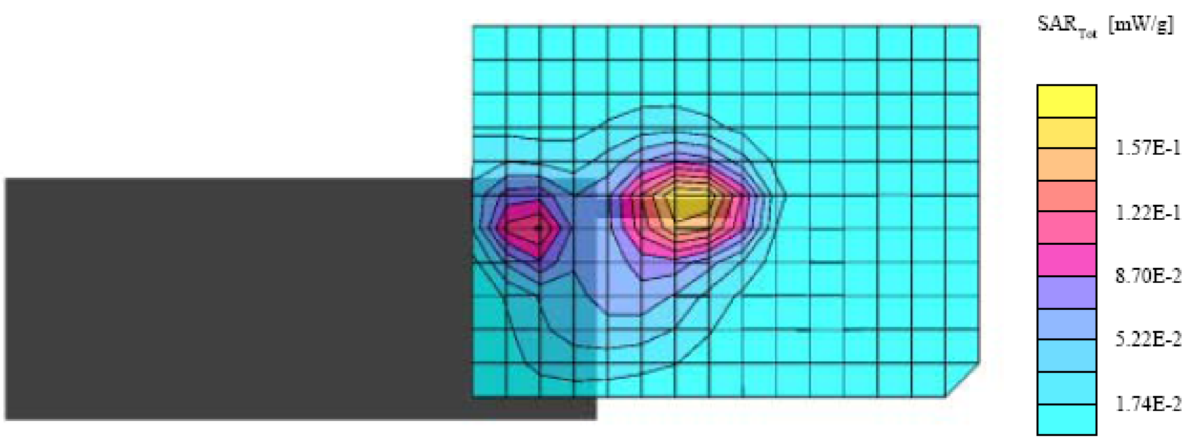
Cybernet, JADEAIRE CDMA (Back side in touch to the flat phantom, Ambient Temp = 23 C, Liquid Temp = 22 C, Mid Channel, 3/30/2004)

SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1880 MHz
Probe: ET3DV2 - SN3019; ConvF(4.60,4.60,4.60); Crest factor: 1.0; Body Liquid 1900MHZ: $\sigma$ = 1.53 mho/m $\varepsilon_r$ = 52.4 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.0313 mW/g, SAR (10g): 0.0150 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: 0.02 dB




Plot #4

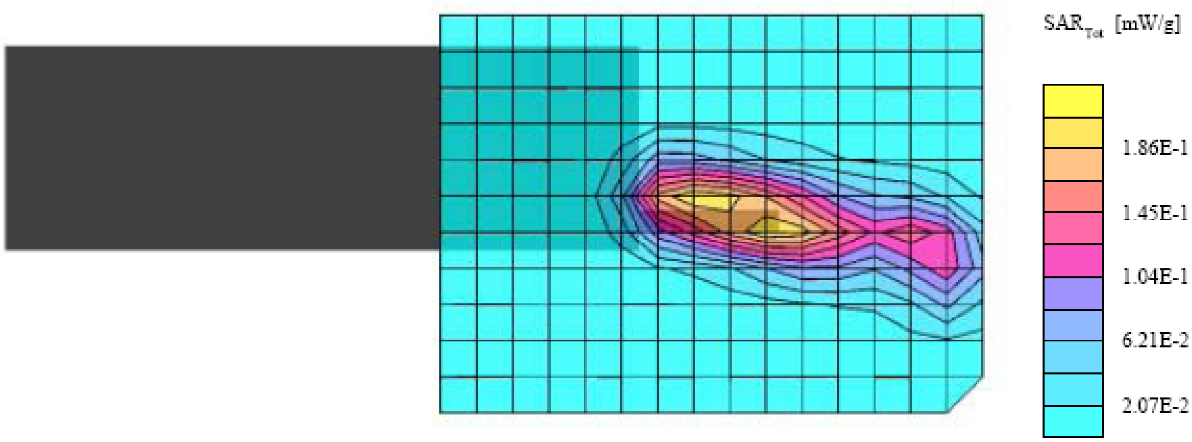
Cybernet, JADEAIRE CDMA (Bottom side in touch to the flat phantom, Ambient Temp = 23 C, Liquid Temp = 22 C, Mid Channel, 3/30/2004)
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1880 MHz
Probe: ES3DV2 - SN3019; ConvF(4.60,4.60,4.60); Crest factor: 1.0; Body Liquid 1900MHz: $\sigma$ = 1.53 mho/m $\varepsilon_r$ = 52.4 $\rho$ = 1.00 g/cm³
Cube 5x5x7: SAR (1g): 0.140 mW/g, SAR (10g): 0.0813 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: 0.03 dB




Plot #5

Cybernet,JADEAIRE CDMA (Right side in touch to the flat phantom, Ambient Temp = 23 C, Liquid Temp = 22 C, Mid Channel, 3/30/2004)

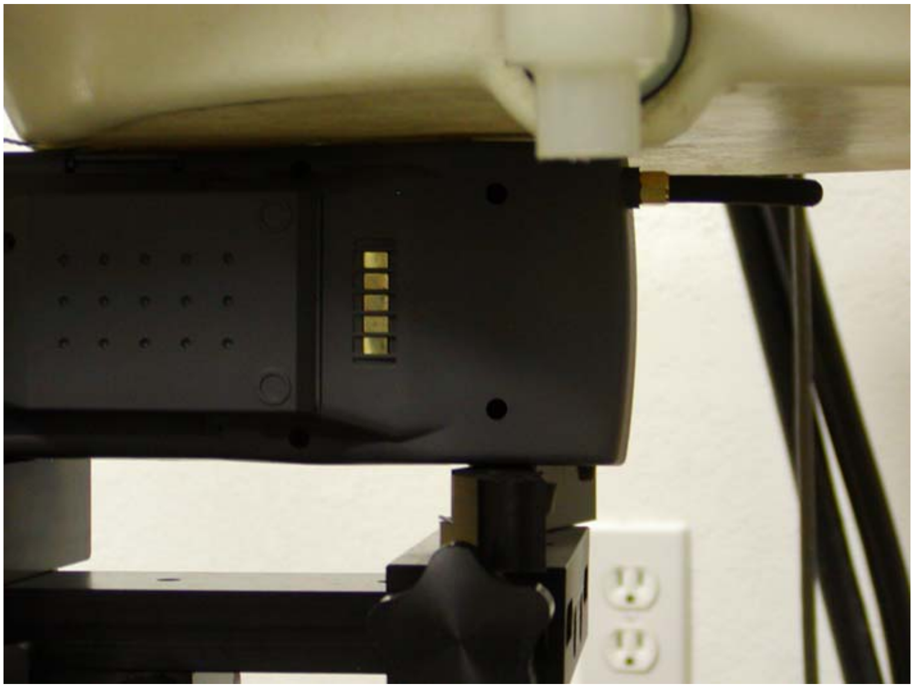
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1880 MHz
Probe: ES3DV2 - SN3019; ConvF(4.60,4.60,4.60); Crest factor: 1.0; 1900 MHz body liquid: $\sigma = 1.53$ mho/m $\varepsilon_r = 52.4$ $\rho = 1.00$ g/cm³
Cube 5x5x7: SAR (1g): 0.232 mW/g, SAR (10g): 0.129 mW/g, (Worst-case extrapolation)
Coarse: Dx = 12.0, Dy = 12.0, Dz = 10.0
Powerdrift: 0.00 dB




Plot #6

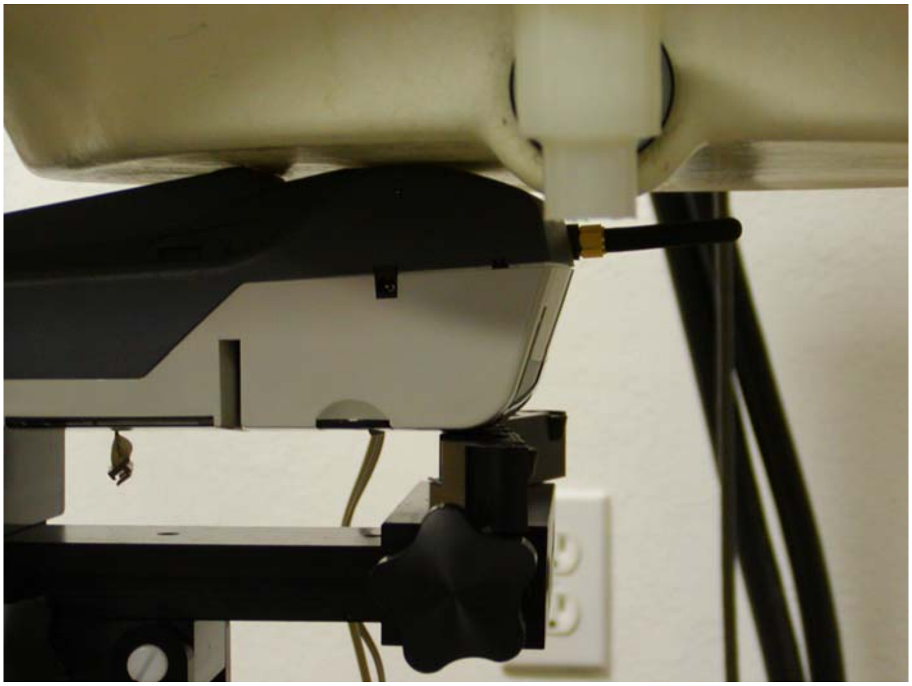
# EXHIBIT A - SAR SETUP PHOTOGRAPHS

### Right Side Touching with Phantom



### Back Side Touching with Phantom

**Bottom Side Touching with Phantom**

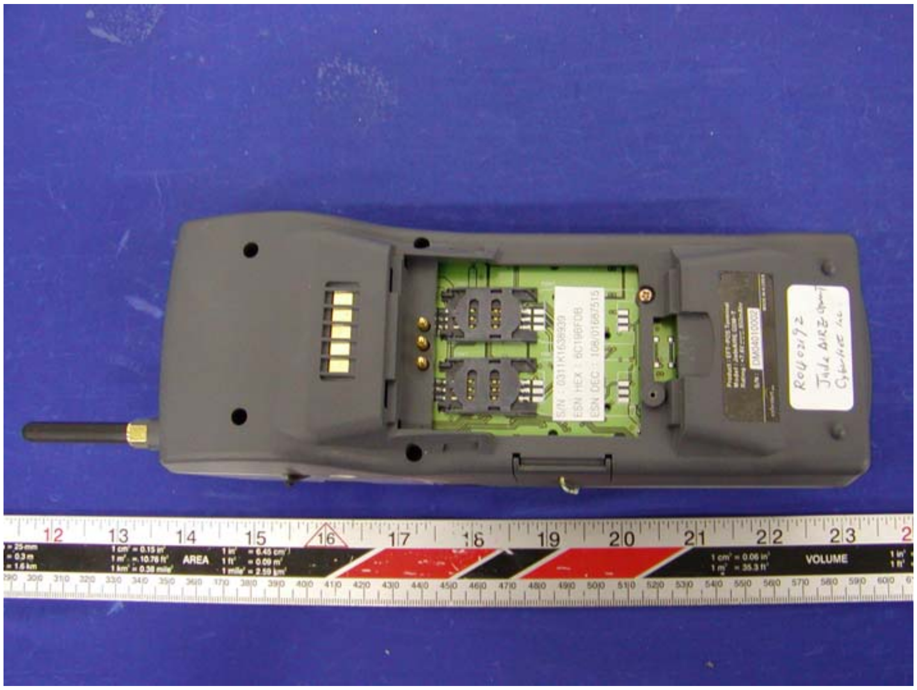


# EXHIBIT B – EUT PHOTOGRAPHS

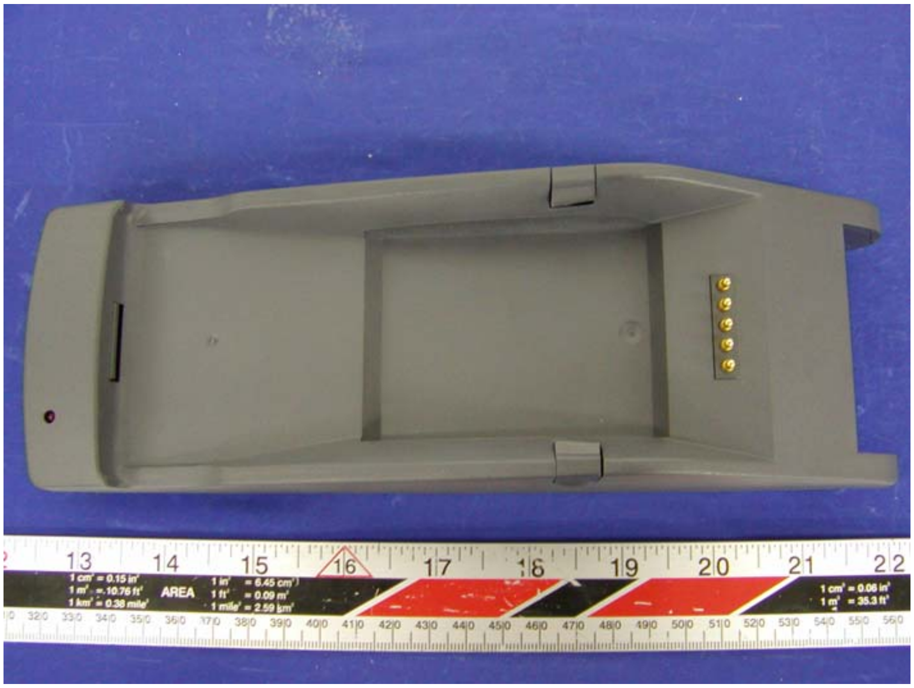
## EUT - Top View


## EUT - Back View

## EUT – Back Side without Battery



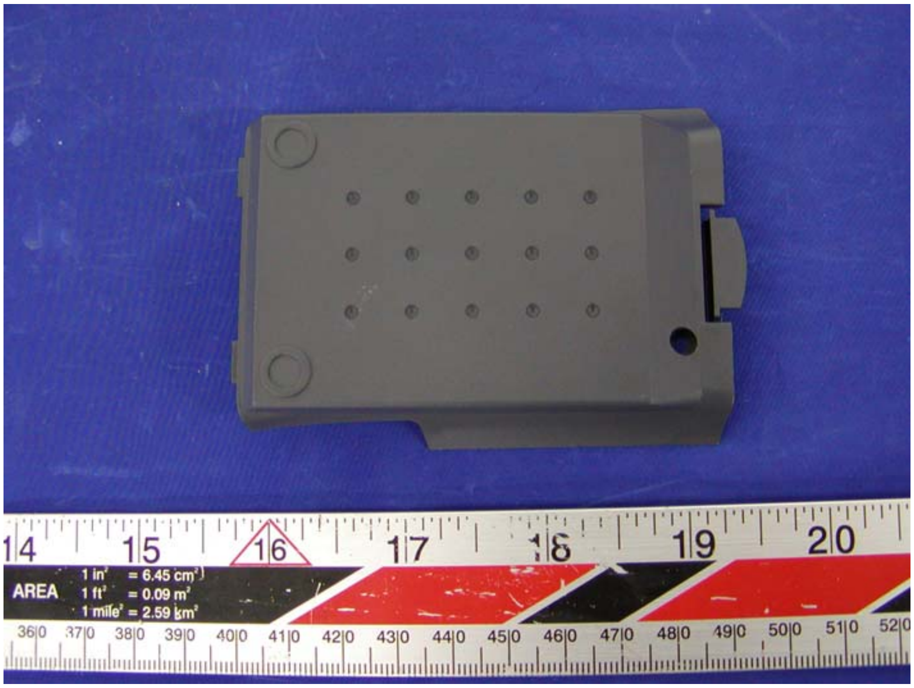

## Docking unit - Top view



## Docking unit - Bottom view


## Docking unit - Connector view

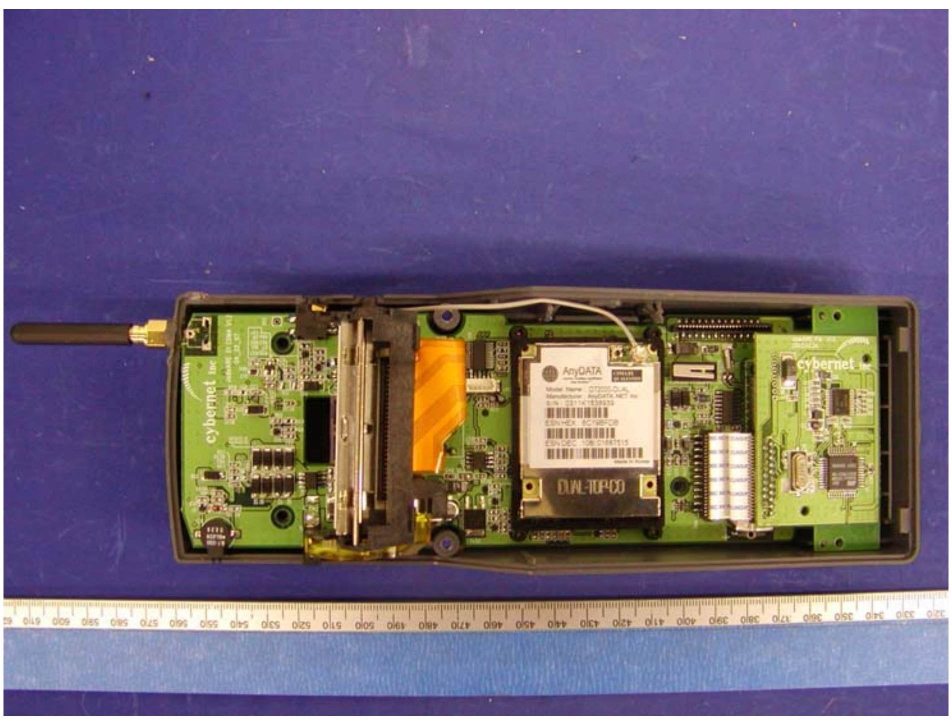
**Battery – Top View**



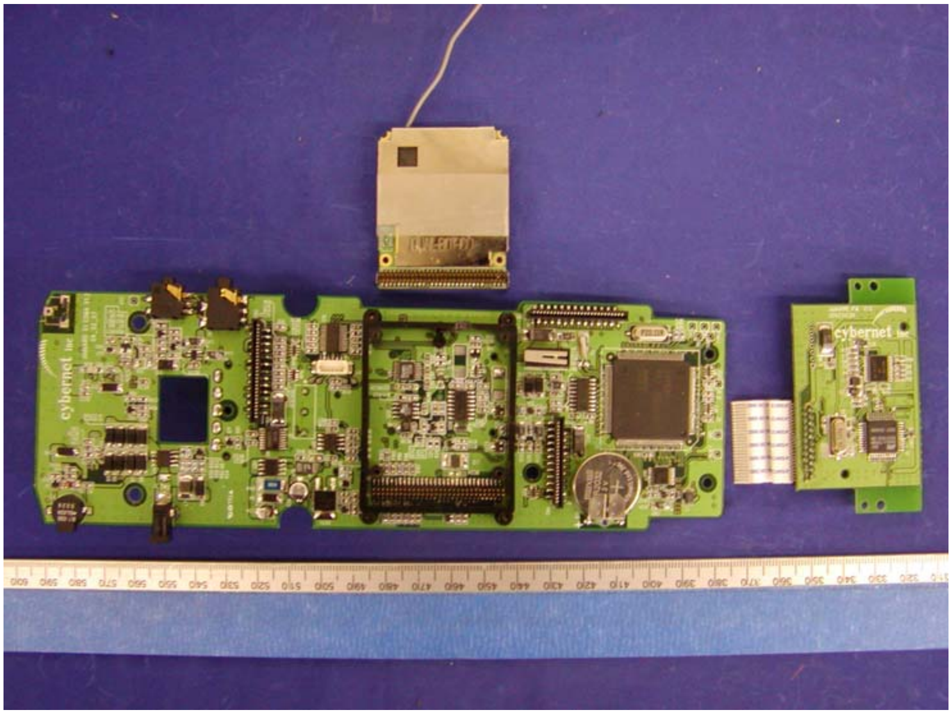

**Battery – Bottom View**

## AC Adapter – Top View

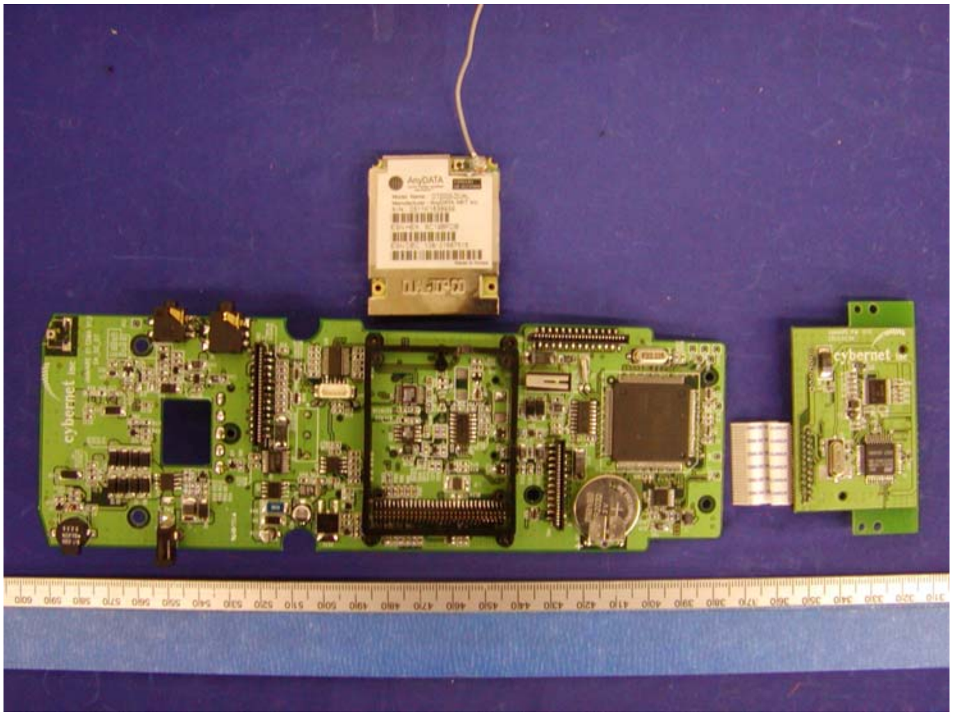

## Chassis – Cover Off View



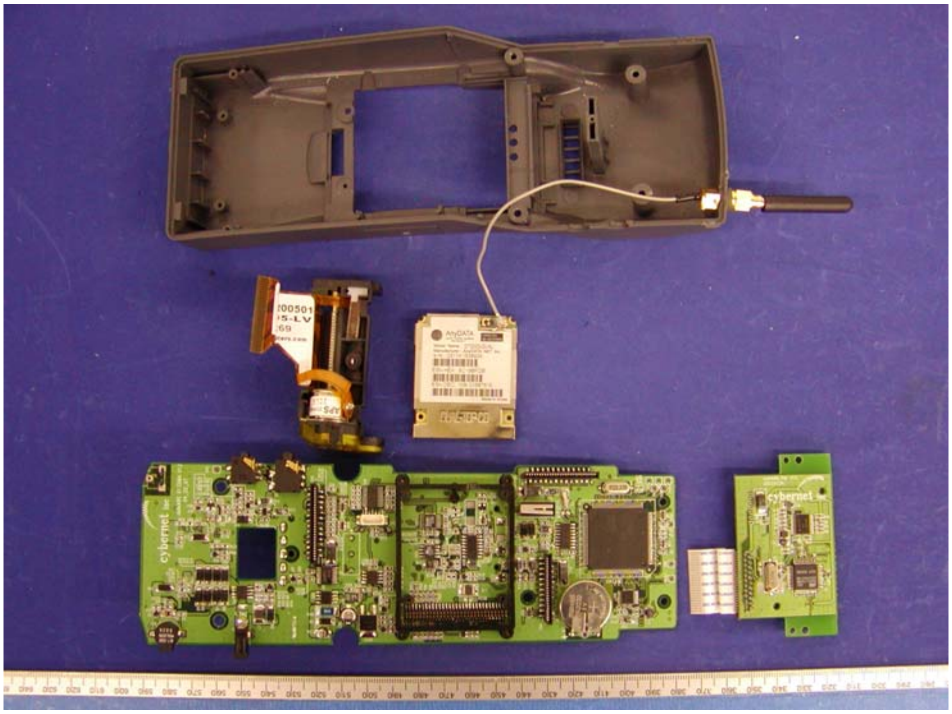
## EUT – Component View I



## EUT – Component View II



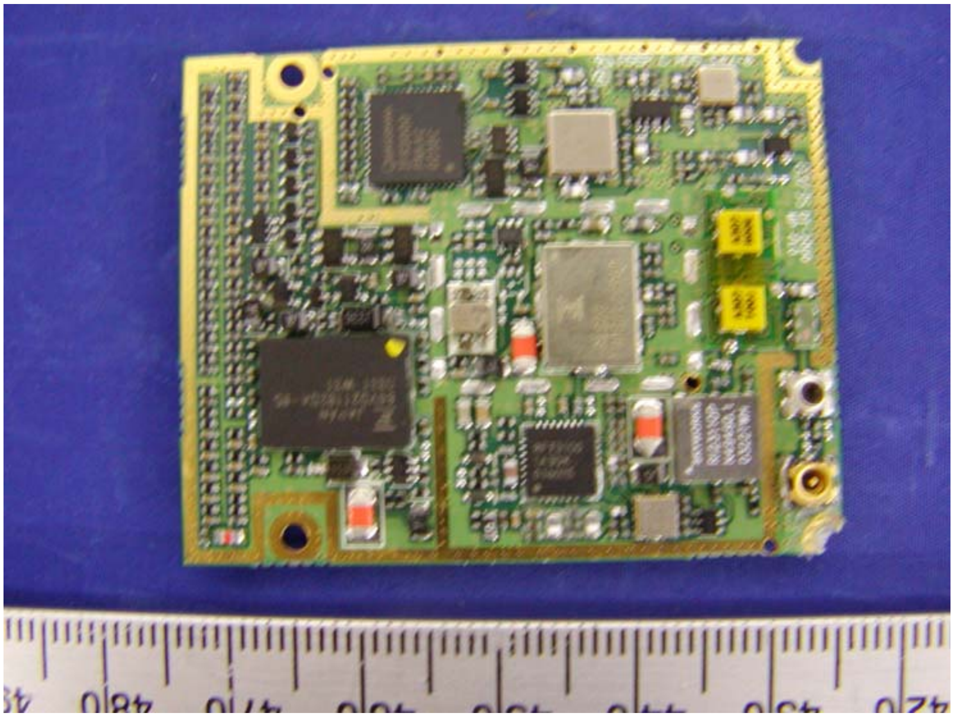
## EUT – Component View III



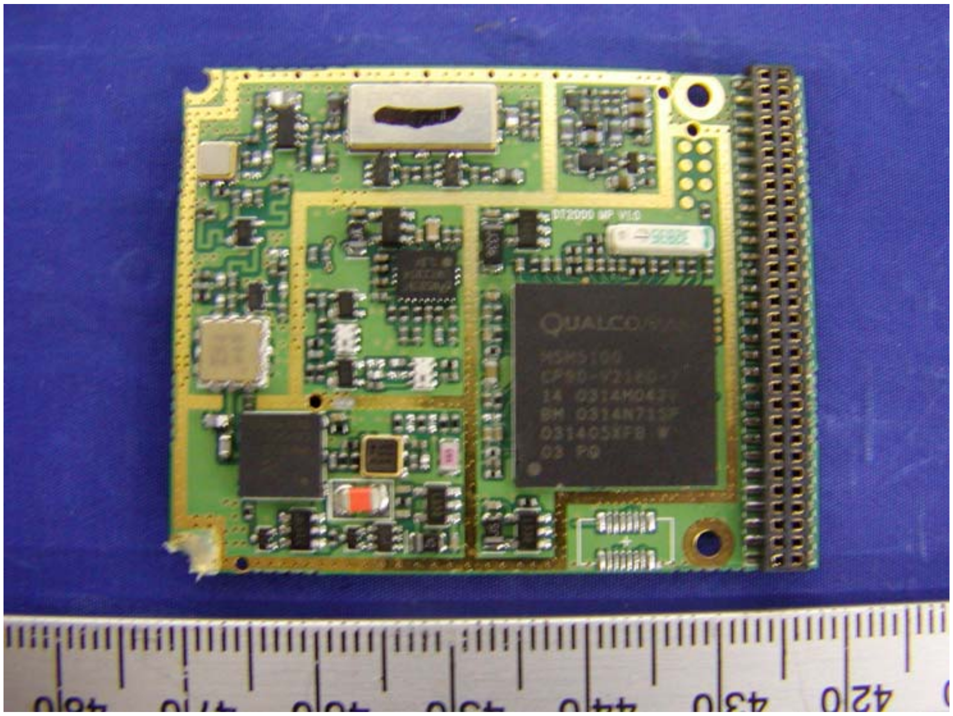
## Transceiver – Top View

**Transceiver – Bottom View**

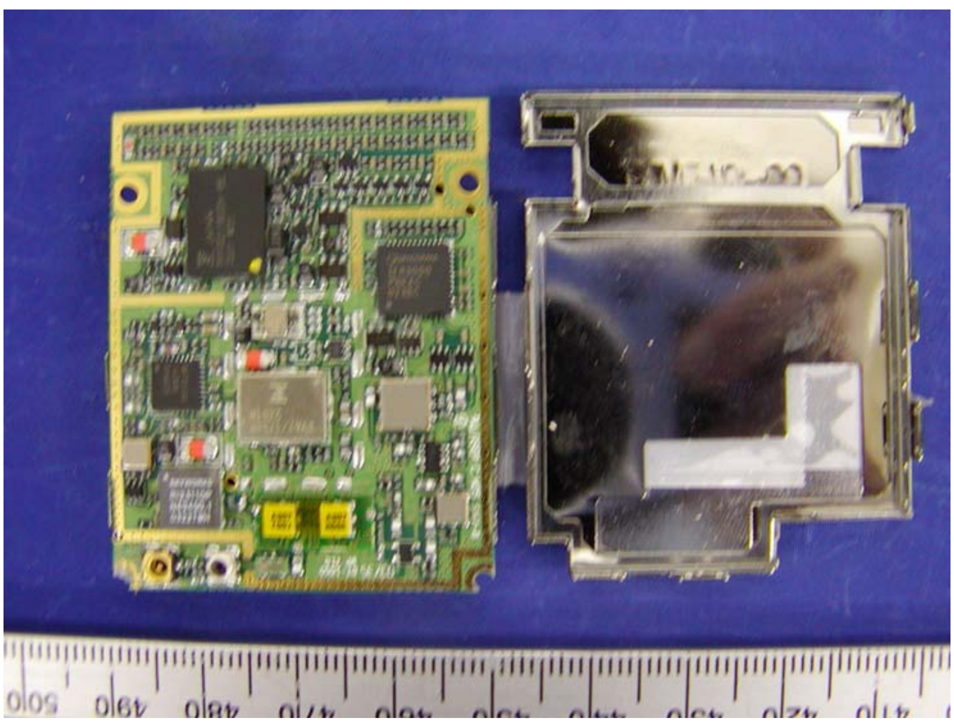
**Transceiver – Component View**



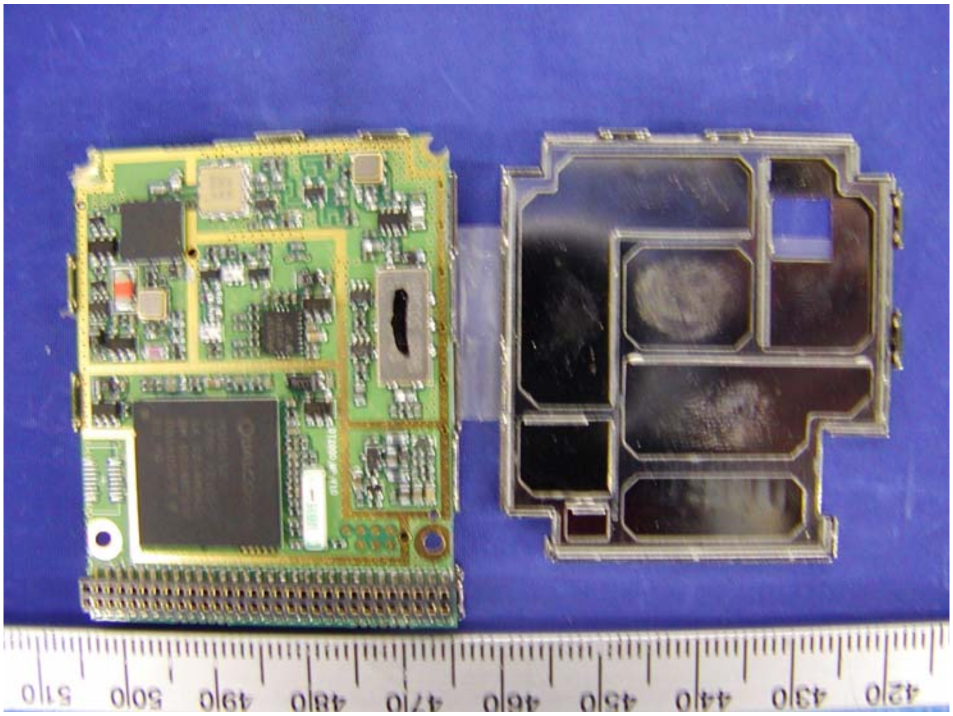
**Transceiver – Solder View**



**Transceiver - Shielding Off View I**



**Transceiver - Shielding Off View II**



# EXHIBIT C – Z-Axis

Cybernet,JADEAIRE CDMA (Right side in touch to the flat phantom, Ambient Temp = 23 C, Liquid Temp = 22 C, Mid Channel, 3/24/2004)

SAM Phantom; Section; Position: ; Frequency: 835 MHz

Probe: ES3DV2 - SN3019; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 835 MHz: $\sigma = 0.94$ mho/m $\varepsilon_r = 53.1$ $\rho = 1.00$ g/cm³

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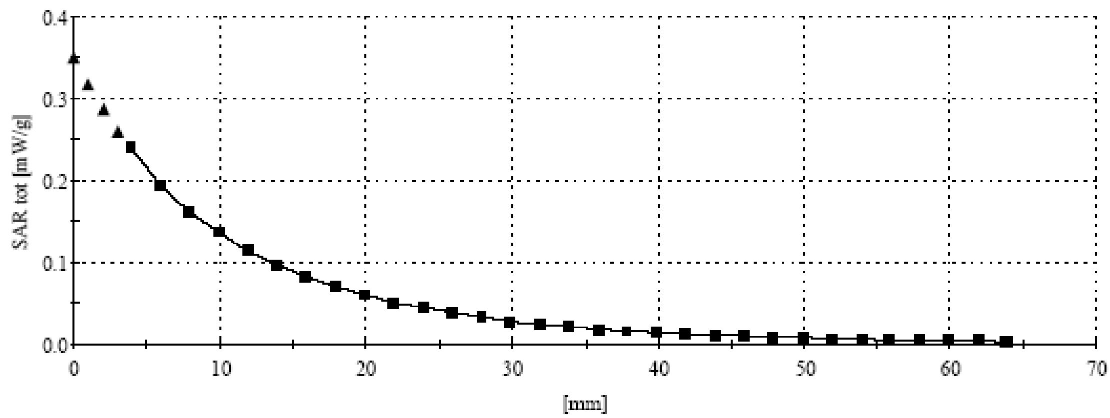
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 2.0



Cybernet,JADEAIRE CDMA (Right side in touch to the flat phantom, Ambient Temp = 23 Deg C, Liquid Temp = 22 Deg C, Mid Channel, 3/30/2004)

SAM Phantom; Section; Position: ; Frequency: 1880 MHz

Probe: ES3DV2 - SN3019; ConvF(4.60,4.60,4.60); Crest factor: 1.0; 1900 MHz body liquid: $\sigma = 1.53$ mho/m $\varepsilon_r = 52.4$ $\rho = 1.00$ g/cm³

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Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 2.0