

**PRODUCT RADIO FREQUENCY ENERGY
EXPOSURE COMPLIANCE TEST
PRFEECT CERTIFICATE**

PRFEECT NO.: N/A DATE SUBMITTED: 3/24/99 REVISION DATE/NUMBER: N/A

PRODUCT MANUFACTURER: Motorola

SECTOR/GROUP/DIVISION: PCD/CIG OTHER: _____

LOCATION (ADDRESS): 5455 N. Beach Street, Fort Worth, Texas 76137

PRODUCT DESCRIPTION: Fixed Wireless Terminal (FWT)

MODEL: ST1056A SERIAL NUMBER: 834G2B4V5

FREQUENCIES OF OPERATION: 824.01 - 848.97 MHz

MAXIMUM POWER OUTPUT (WATTS): 1

TEST METHOD: SAR to Occupational/Controlled Exposure Limits

TESTING LOCATION: Motorola Florida Research Laboratories (MFL)

PRODUCT CUSTOMERS AND LOCATION (to confirm applicable standards, state whether the customers are consumers or other users and identify general geographic areas where product is intended to be sold):

Global

Based on the information provided and the testing results obtained for the above described product, the undersigned certifies that, when used as stated in the operating instructions supplied, said product is within the limits identified in Policy Section III for the region in which it is intended to be sold.

PRINT NAME: Q. B.zano

SIGNED: _____ DATE APPROVED: 4/6/99

TITLE: Chief EME Scientist, Motorola Florida Research Laboratories

LOCATION: Motorola 8000 W. Sunrise Blvd., Plantation, Florida 33322

PHONE: (954) 723-6139 FAX: (954) 723-5611

Forward a signed copy of this form to: Motorola Chief EME Scientist, Motorola Inc., Motorola Florida Research Laboratories, 8000 West Sunrise Boulevard, Plantation, Florida 33322, USA.



MOTOROLA

Motorola Florida Research Laboratories

SAR Measurement Report

For the compliance of Motorola Communications Devices with the American National Standard Institute, ANSI/IEEE C95.1, 1992. Standard for Safety level with respect to Human Exposure to Radiofrequency Electromagnetic Fields 3KHz to 300GHz.

Radio Type Fixed Wireless Terminal

Model # ST1056A

Serial # 63462854V5

Transmitter Freq. (MHz) 836.50

Transmitter Power (Watts) .2 continuous power

Antenna Type Center fed

Battery Type AC adapter

Test Conditions full body; abdomen; muscle

Volume for Spatial Peak SAR Averaging (cm³) 1

Spatial Peak Measured SAR Average (mW/g) .02

Transmitter Power Start .2 Transmitter Power End .2

Transmitter Peak Power 1

Equation for max expected SAR value:

$$(\text{Peak Power/Power End}) \times \text{measured SAR} = \text{max expected SAR mW/g}$$

$$(1 / .2) \times .02 = .1 \text{ mW/g}$$

If push to talk 50% duty cycle:

$$\text{max expected SAR}/2 = \text{time averaged SAR mW/g}$$

$$\text{N/A} / 2 = \text{N/A mW/g}$$

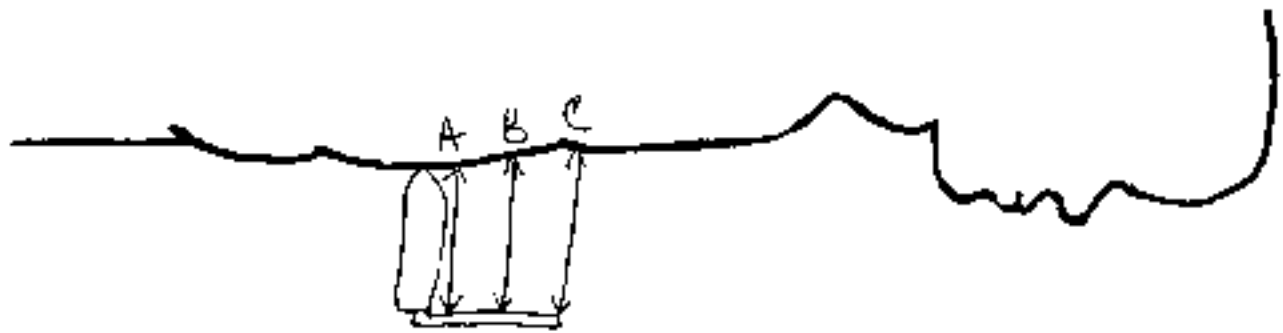
Observations: Unit distance of antenna to abdomen was far enough to practically measure the muscle level.

Performed By: Shannon Bahhaus Date: 3/16/99

Approved By: W. Bahhaus Date: 4/7/99

odel # ST1056A ~~AMZ~~

uad # 6343ZBFH5



Unit front edge against abdomen as if sitting down; antenna at 90°

Distance of antenna to abdomen

$$A = 190\text{mm}$$

$$B = 200\text{mm}$$

$$C = 210\text{mm}$$

: 3.58

lo Type : Fixed Wireless Terminal (FNT)
el Number : ST1056A
lal Number : 63462054V5
quency : 836.52 MHz
t Trans. Pwr : 0.200 W
rt Trans. Pwr: 0.200 W
anna Type : Center Fed
anna Posn. : Out
ntom Type : Body
ntom Posn. : Abdomen
y Type : ZOCM/SAR
pe Name : p041
ld Type : E Field
ntation : 0 Degree

ture Type - Muscle
ture Dielectric Constant = 54.600
ture Conductivity - 1.070

ment :
Unit front side against abdomen; as if it were sitting on a table
Antenna at 90 degree angle

st : MOBILE ROBOT

pe Offset = 0.28 cm
sor Factor = 0.0108
ersion Factor = 0.915

1 Amplifier Channel Settings : 0.192 0.154 0.116

Location : x = 0.250, y = -3.500, z = 0.000 (cm) Value = 0.359

asured Values (volts) =
.782E-004 2.525E-004 2.413E-004 2.225E-004 1.773E-004 1.749E-004
.208E-004 1.390E-004 7.220E-005 7.096E-005 6.924E-005

z. Voltage @ Surface (Vs) = 0.0003

tags @ 1.00 cm (Vt) = 0.0002

. Voltage (Vs+Vt)/2 = 0.0003

. SAR over 1 g (mW/g) = 0.0227

SAR Scan

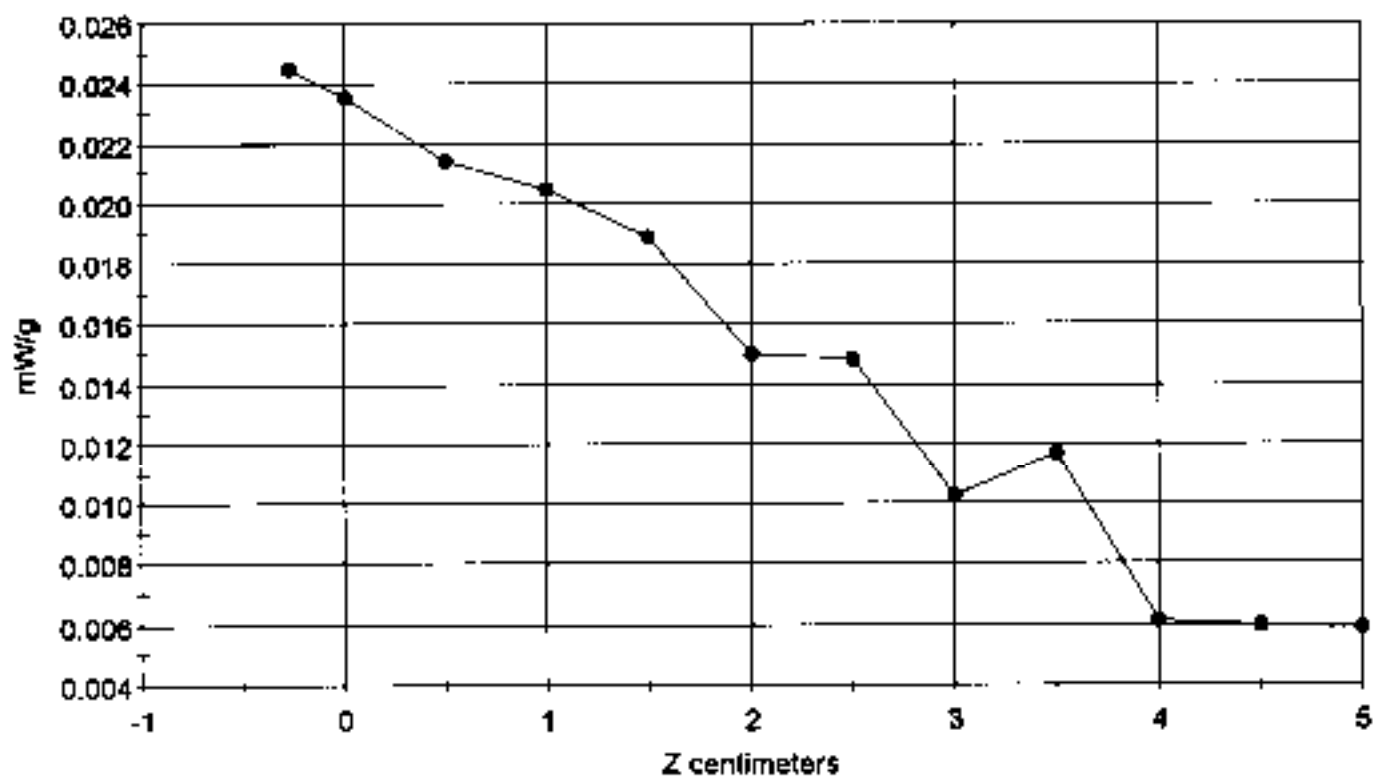
File : 99031603_ZOOM.VLT

Start : 16-Mar-99 10:21:36 am End : 16-Mar-99 10:33:28 am

Fixed Wireless Terminal (FWT)/ST1056A/ 634GZB54V5; 836.52MHz;W;Center Fed/Out;

Body/Abdomen;ZOOM/SAR;p041/E Field/0 DegreesMuscle/54.600/1.070

3.58

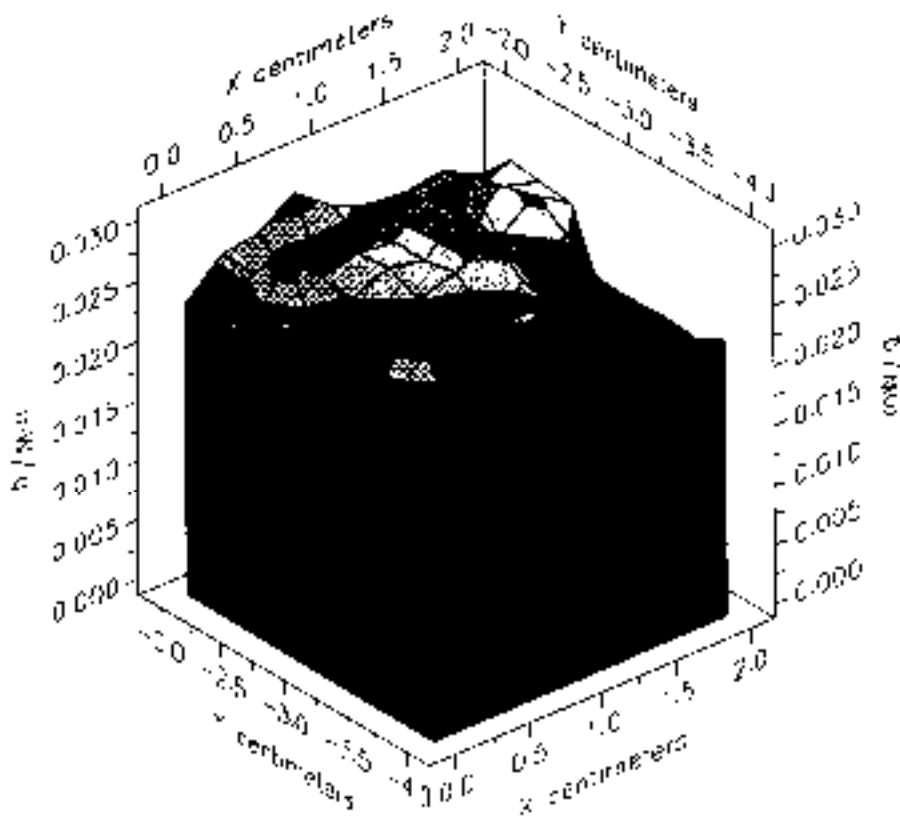


File : 99031603_ZOOM.VLT

Start : 16-Mar-99 10:21:36 am End : 16-Mar-99 10:33:28 am

Red Wireless Terminal (FWT)/ST1056A/ 634GZB54V5; 836.52MHz;W;Center Fed/Out;
Body/Abdomen;ZOOM/SAR;p041/E Field/0 DegreesMuscle/54.600/1.070

3.58

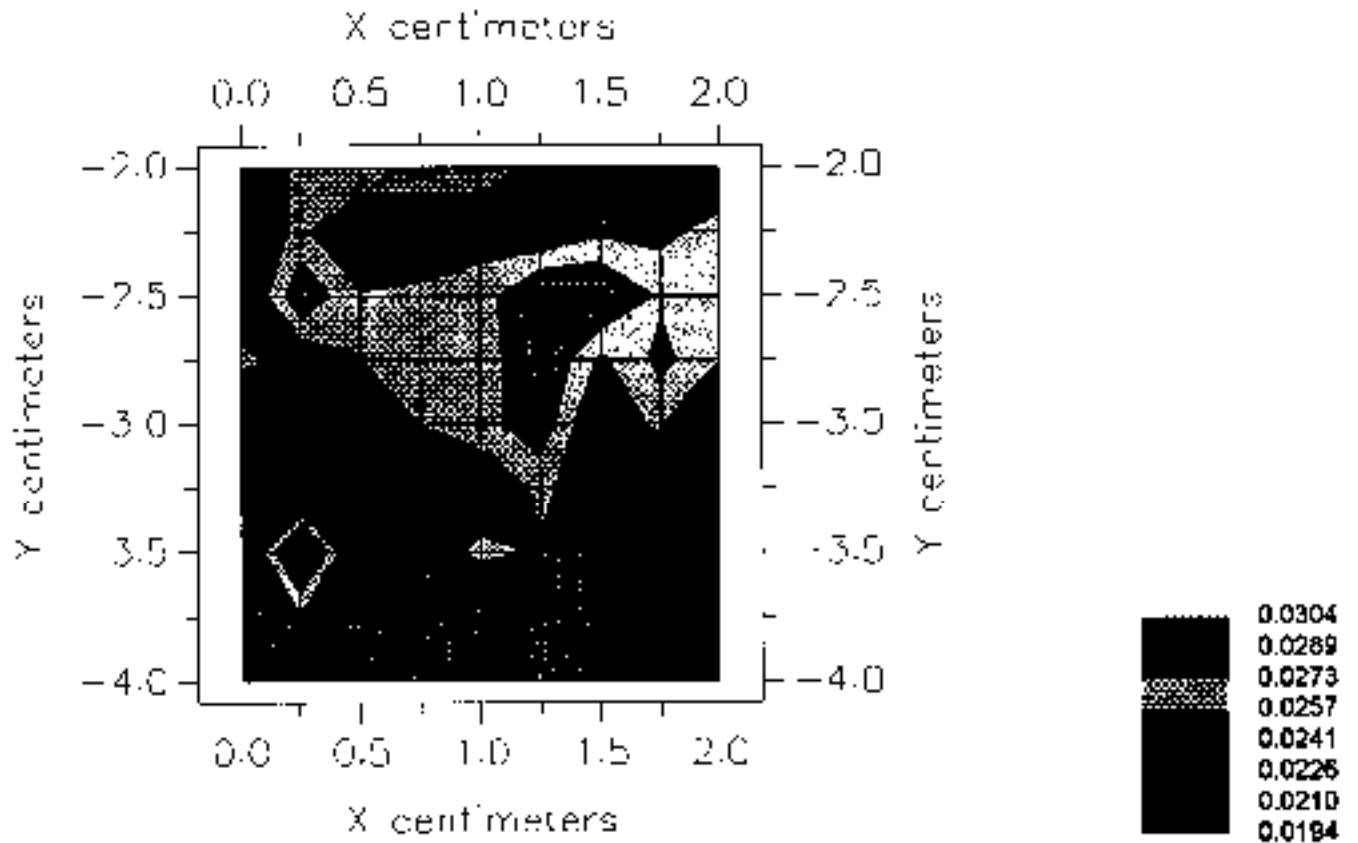


File : 99031603_ZOOM.VLT

Start : 15-Mar-99 10:21:36 am End : 15-Mar-99 10:33:28 am

Red Wireless Terminal (FWT)/ST1056A/ 634GZB54V5; 836.52MHz;W;Center Fed/Out;
Body/Abdomen;ZOOM/SAR;p041/E Field/0 DegreesMuscle/54.600/1.070

3.58



File : c:/idx3/SYSTEM/SARMEAS3/data/Normal/99031603_AREA.VLT
Start : 16-Mar-99 09:55:46 am End : 16-Mar-99 10:21:36 am
Ver : 3.58

Radio Type : Fixed Wireless Terminal (FWT)
Model Number : ST1056A
Serial Number : 634GZB54V5
Frequency : 836.52 MHz
Peak Trans. Pwr : 0.200 W
Start Trans. Pwr: 0.200 W
Antenna Type : Center Fed
Antenna Posn. : Out
Phantom Type : Body
Phantom Posn. : Abdomen
Scan Type : AREA
Probe Name : p041
Field Type : E Field
Orientation : 0 Degree

Mixture Type - Muscle
Mixture Dielectric Constant = 54.600
Mixture Conductivity - 1.070

Comment :

Unit front side against abdomen; as if it were sitting on a table
Antenna at 90 degree angle

Robot : MOBILE ROBOT

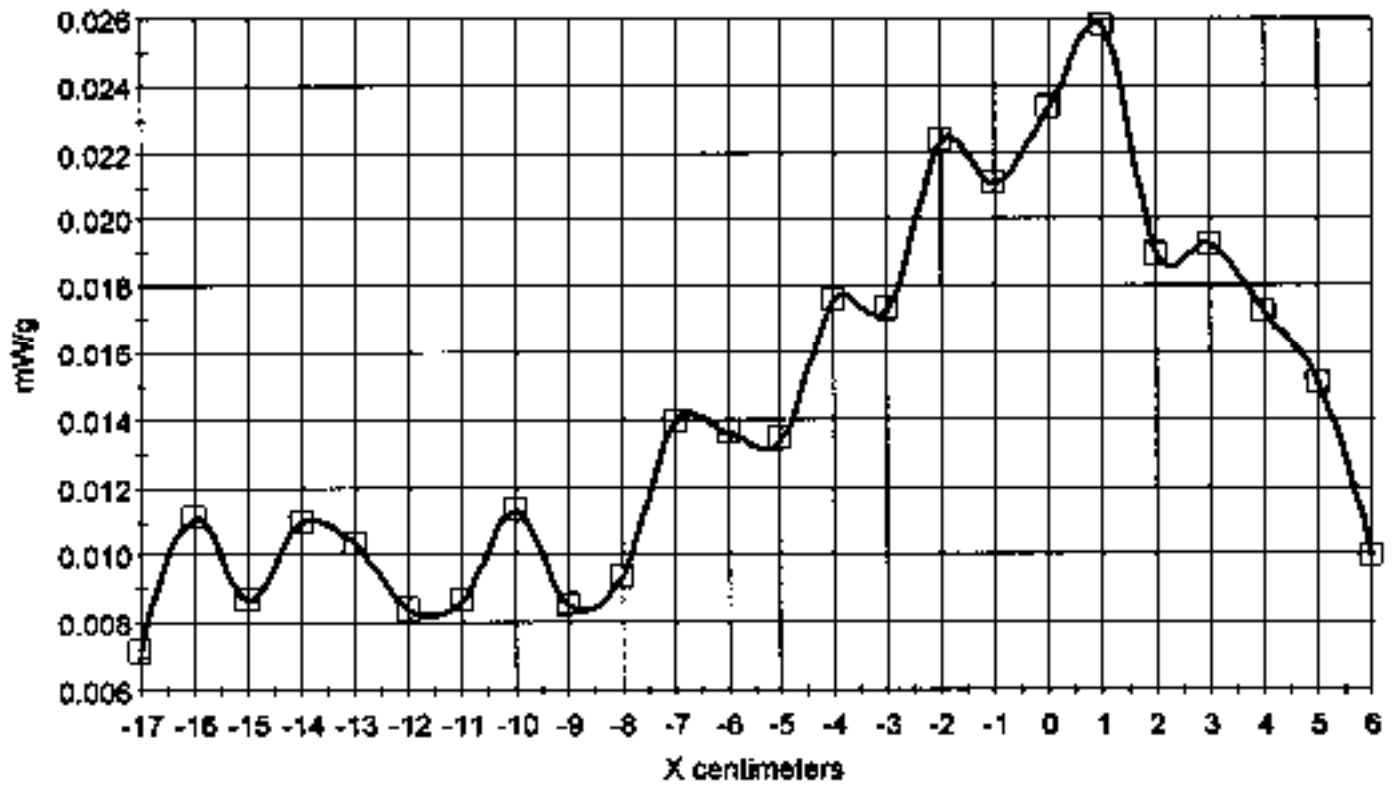
Probe Offset = 0.29 cm
Sensor Factor = 0.0108
Conversion Factor = 0.915

p041 Amplifier Channel Settings : 0.192 0.154 0.116

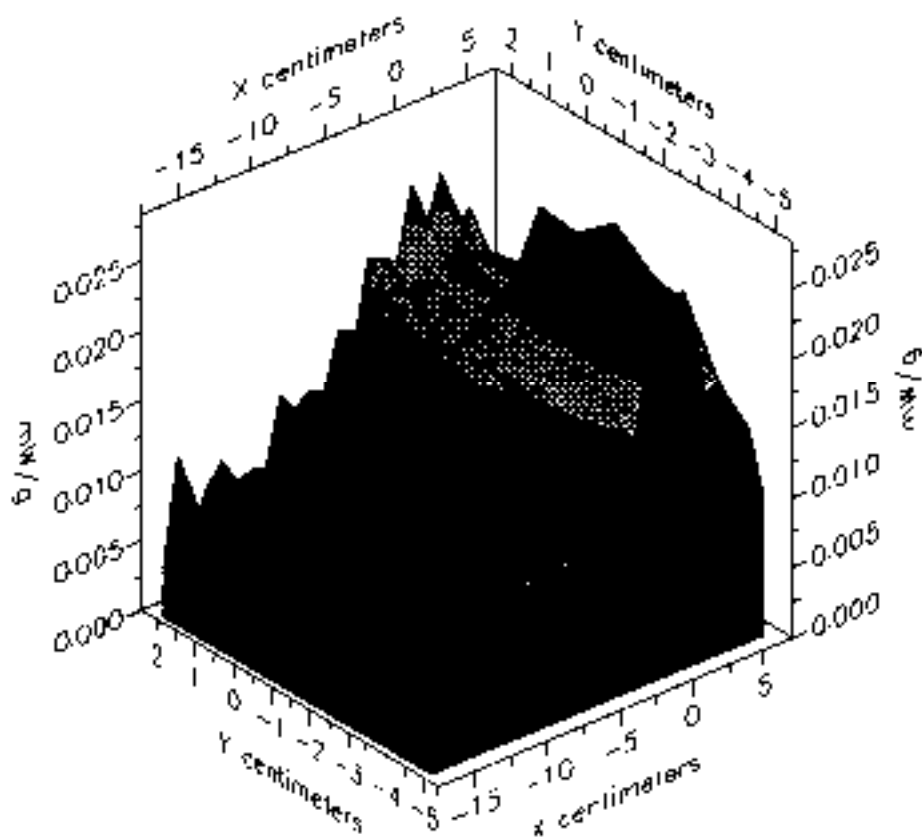
Max Location : X = 1.000, Y = -3.000, Z = 0.000 [cm] Value = 0.334

Area too wide. SAR value not calculated

X-Z Plane Slice Y=-5.000
File : 99031803_AREA.VLT
Start : 15-Mar-99 09:55:46 am End : 16-Mar-99 10:21:36 am
Fixed Wireless Terminal (FWT)/ST1056A/834GZB54V5; 836.52MHz;W;Center Fed/Out;
Body/Abdomen;AREA;p041/E Field/0 DegreesMuscle/54.600/1.070
3.58



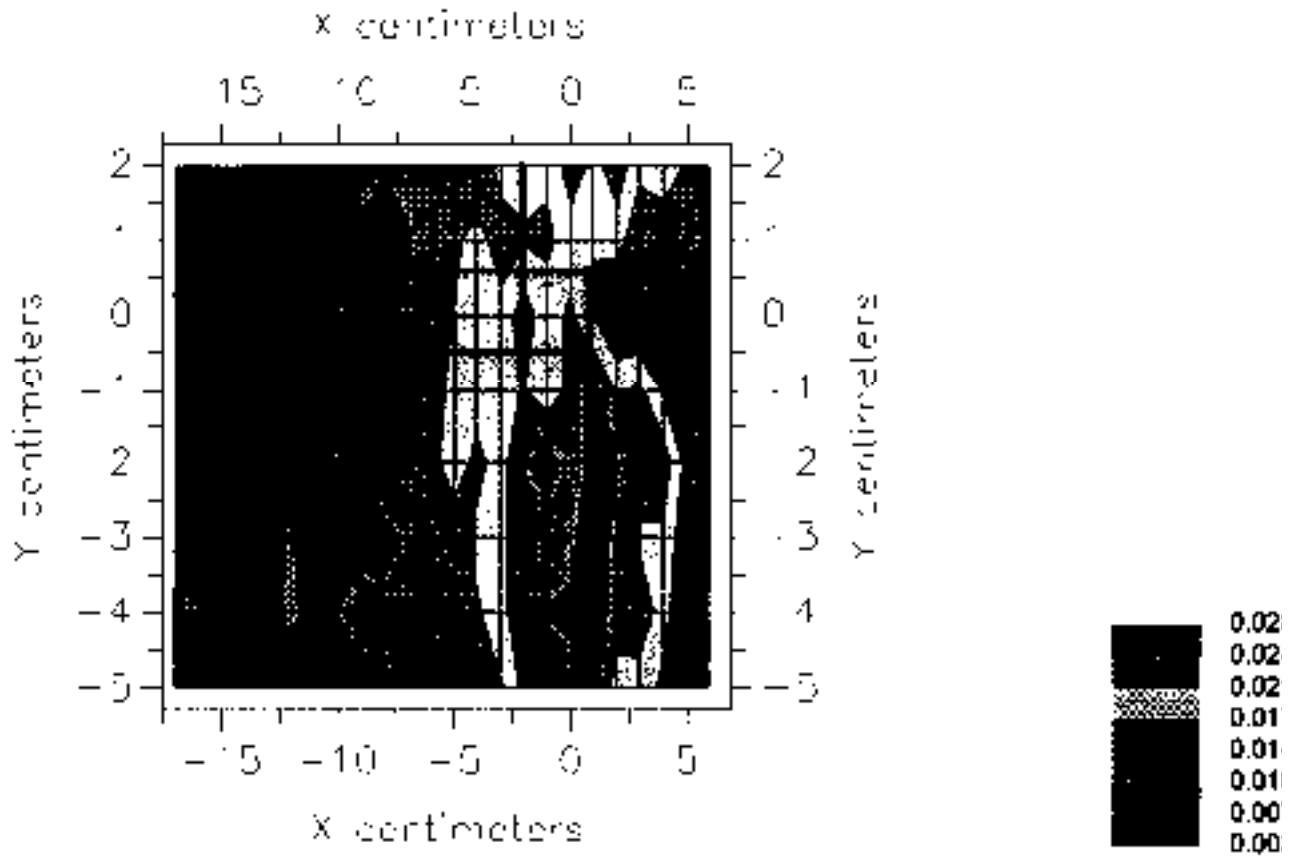
File : 99031603_AREA.VLT
Start : 16-Mar-99 09:55:46 am End : 16-Mar-99 10:21:36 am
Fixed Wireless Terminal (FWT)/ST1056A/634GZB54V5; 836.52MHz;W;Center Fed/Out;
Body/Abdomen;AREA;p041/E Field/0 DegreesMuscle/54.800/1.070
3.58



File : 99031603_AREA.VLT

Start : 16-Mar-99 09:55:46 am End : 16-Mar-99 10:21:36 am

Fixed Wireless Terminal (FWT)/ST1056A/634GZB54V5; 836.52MHz;W;Center Fed/Out;
Body/Abdomen;AREA;p041/E Field/0 DegreesMuscle/54.600/1.070
3.58





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SAR Measurement Report

For the compliance of Motorola Communications Devices with the American National Standard Institute, ANSI/IEEE C95.1, 1992. Standard for Safety level with respect to Human Exposure to Radiofrequency Electromagnetic Fields 3KHz to 300GHz.

Radio Type Fixed Wireless Terminal

Model # ST1050A

Serial # 103HG2B5HV5

Transmitter Freq. (MHz) 836.52

Transmitter Power (Watts) .2 continuous power

Antenna Type center fed

Battery Type AC adapter

Test Conditions full body; abdomen; muscle

Volume for Spatial Peak SAR Averaging (cm³) 1

Spatial Peak Measured SAR Average (mW/g) 1.1

Transmitter Power Start .2 Transmitter Power End .2

Transmitter Peak Power 1

Equation for max expected SAR value:

$$(\text{Peak Power/Power End}) \times \text{measured SAR} = \text{max expected SAR mW/g}$$

$$(\underline{1} / \underline{.2}) \times \underline{1.1} = \underline{5.5} \text{ mW/g}$$

If push to talk 50% duty cycle:

$$\text{max expected SAR}/2 = \text{time averaged SAR mW/g}$$

$$\underline{N/A} / 2 = \underline{N/A} \text{ mW/g}$$

Observations: Antenna is 2.5cm from body

Performed By: Narman Zuhairi Date: 3/23/99

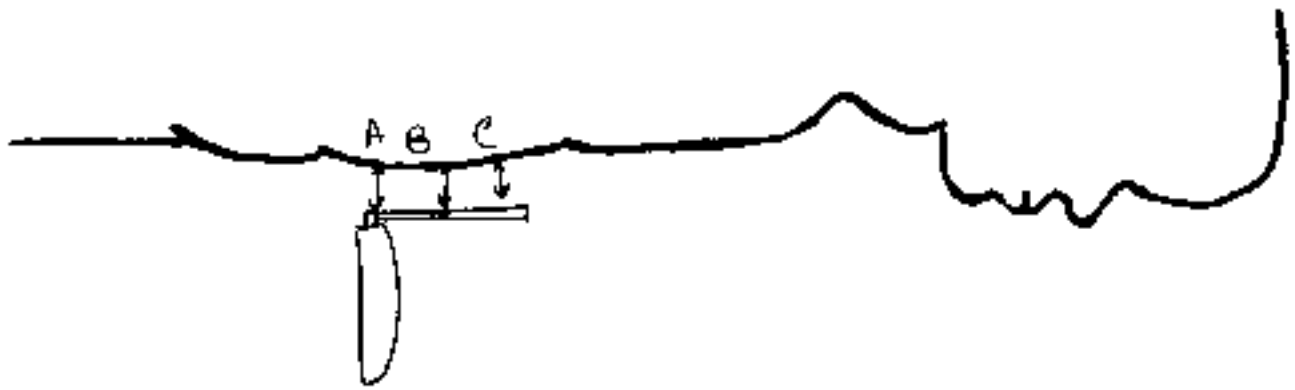
Approved By: [Signature] Date: 4/7/99

Fixed Wireless Terminal

3/23/99

Model # ST1056A (Am2)

Serial # 634G2B54V5



Backside of unit w/antenna facing
abdomen

Distances of antenna

A = 25 mm

B = 25 mm

C = 30 mm

Start : 23-Mar-99 02:14:02 pm End : 23-Mar-99 02:14:34 pm
Ver : 3.58

Radio Type : Fixed Wireless Terminal (FWT)
Model Number : ST1001B
Serial Number : 634DXW1045
Frequency : 836.52 MHz
Peak Trans. Pwr : 0.200 W
Start Trans. Pwr: 0.200 W
Antenna Type : Center Fed
Antenna Posn. : Out
Phantom Type : Body
Phantom Posn. : Abdomen
Scan Type : SAR
Probe Name : p041
Field Type : E Field
Orientation : 0 Degrees

Mixture Type = Muscle
Mixture Dielectric Constant = 54.600
Mixture Conductivity = 1.070

Comment :
Unit back edge w/antenna facing abdomen
Antenna is 2.5 cm away

Robot : MOBILE ROBOT

Probe Offset = 0.28 cm
Sensor Factor = 0.0108
Conversion Factor = 0.915

p041 Amplifier Channel Settings : 0.192 0.154 0.116

Max Location : X = -11.500, Y = -0.500, Z = 0.000 (cm) Value = 14.629

Measured Values (volts) =
1.423E-002 1.128E-002 9.568E-003 8.112E-003 6.877E-003 5.875E-003
5.103E-003 4.372E-003 3.692E-003 3.163E-003 2.747E-003 2.343E-003
2.019E-003

Calc. Voltage @ Surface (Vs) = 0.0178

Voltage @ 1.00 cm (Vt) = 0.0083

Ave. Voltage (Vs+Vt)/2 = 0.0130

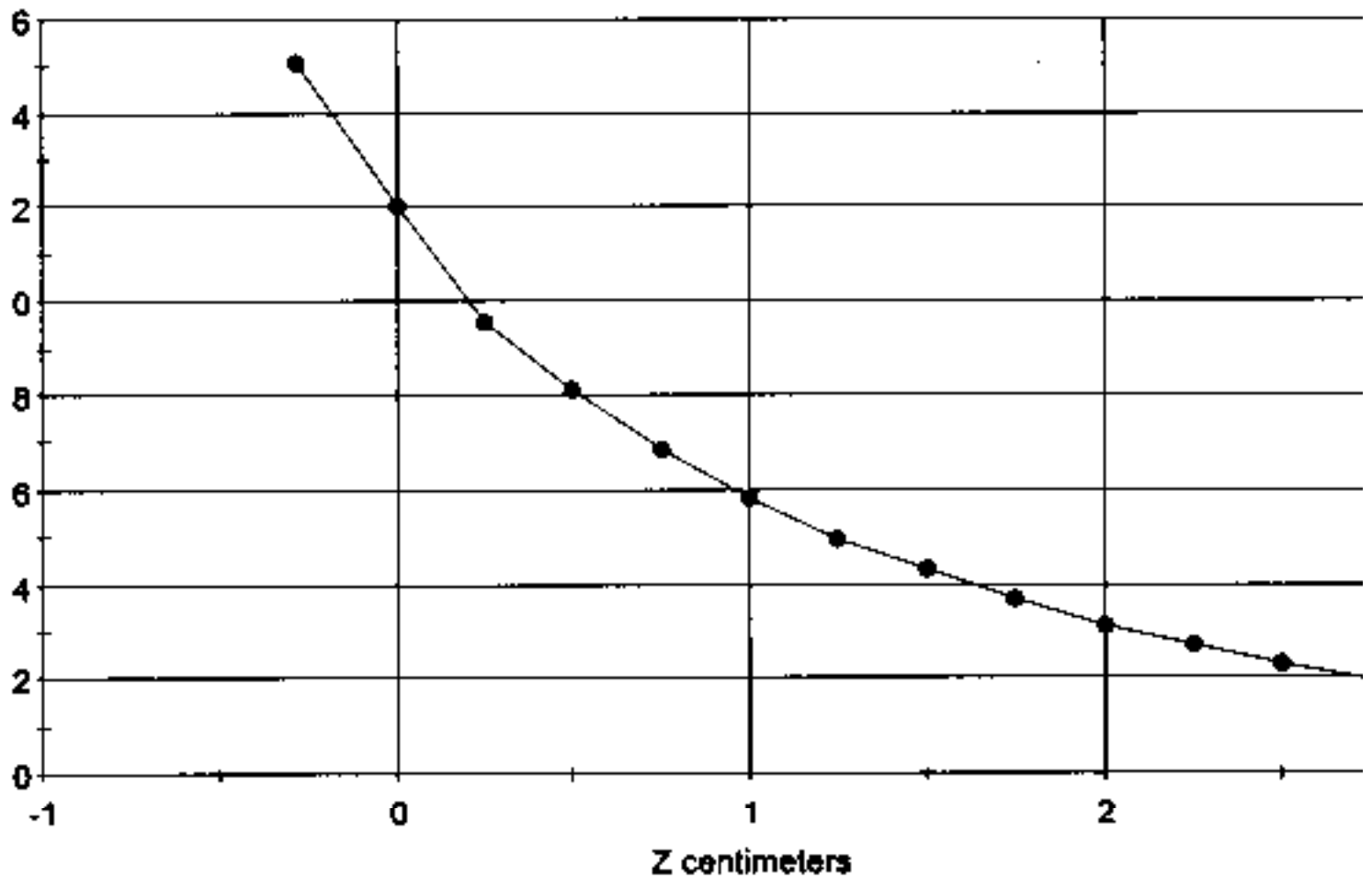
Ave. SAR over 1 g (mW/g) = 1.1040

SAR Scan

File : 99032306_ZOOM.VLT

Start : 23-Mar-99 02:14:02 pm End : 23-Mar-99 02:14:34 pm

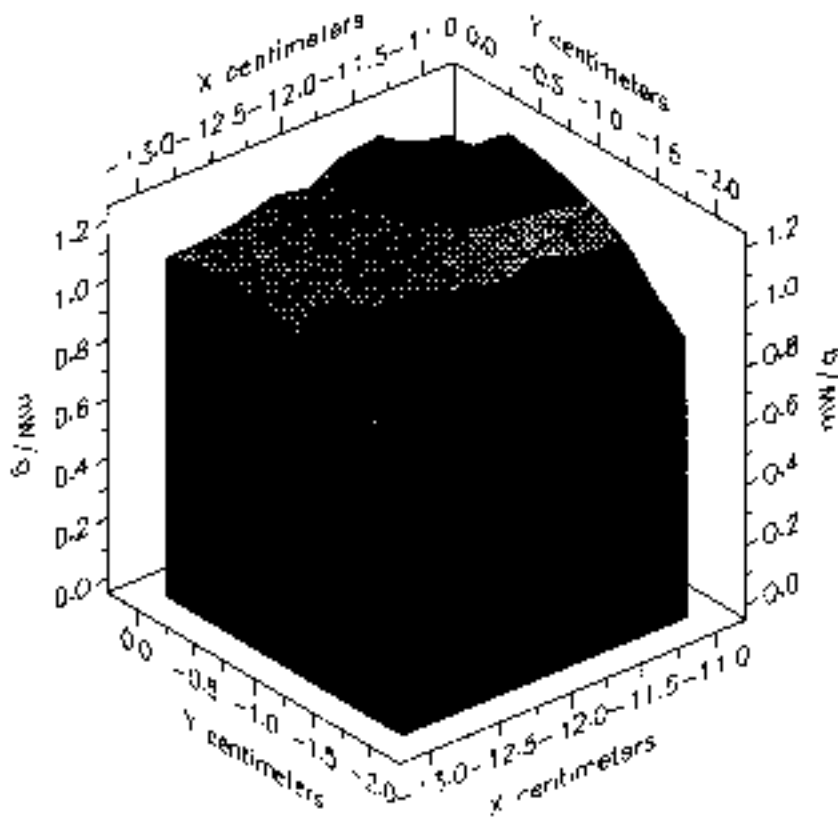
Fixed Wireless Terminal (FWT)/ST1001B/634DXW1045;836.52MHz;W;Center Fed/Ou
Body/Abdomen;SAR;p041/E Field/0 DegreesMuscle/54.600/1.070
3.58



File : 99032305_ZOOM.VLT

Start : 23-Mar-99 01:57:35 pm End : 23-Mar-99 02:06:12 pm

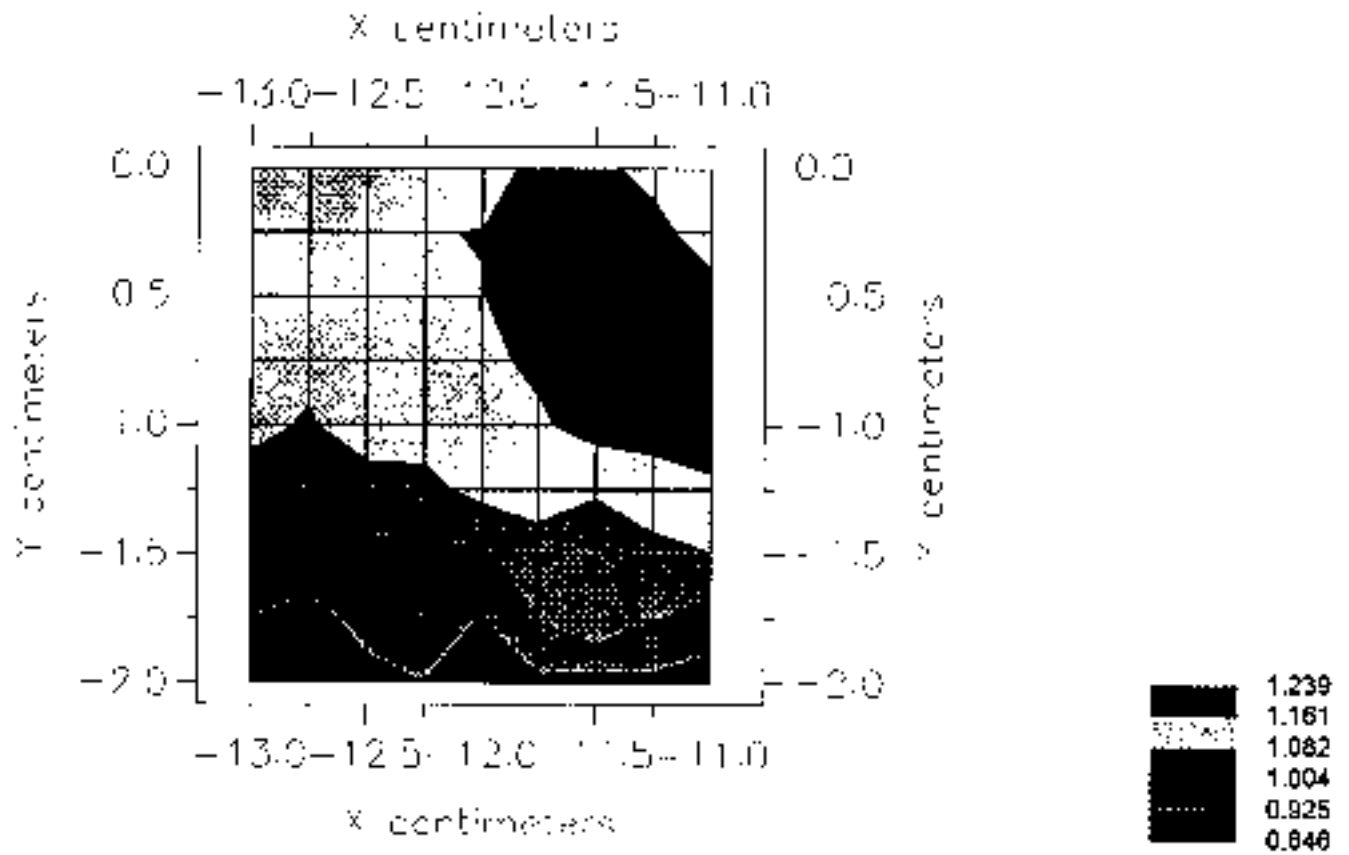
Fixed Wireless Terminal (FWT)/ST1056A/634GZB54V5;836.52MHz;W;Center Fed/Out;
Body/Abdomen;ZOOM/SAR;p041/E Field/0 Degree/Muscle/54.600/1.070
3.58



File : 99032305_ZOOM.VLT

Start : 23-Mar-99 01:57:35 pm End : 23-Mar-99 02:06:12 pm

Fixed Wireless Terminal (FWT)/ST1056A/834GZB54V5;836.52MHz;W;Center Fed/Out;
Body/Abdomen,ZOOM/SAR;p041/E Field/D DegreesMuscle/54.600/1.070
3.58



File : c:/idx3/SYSTEM/SARMEAS3/data/Normal/99032305 AREA.VLT
Start : 23-Mar-99 01:34:52 pm End : 23-Mar-99 01:57:35 pm
Ver : 3.58

Radio Type : Fixed Wireless Terminal (FWT)
Model Number : ST1056B
Serial Number : 634GZBS4V6
Frequency : 836.52 MHz
Peak Trans. Pwr : 0.200 W
Start Trans. Pwr: 0.200 W
Antenna Type : Center Fed
Antenna Posn. : Out
Phantom Type : Body
Phantom Posn. : Abdomen
Scan Type : AREA
Probe Name : p041
Field Type : E Field
Orientation : 0 Degrees

Mixture Type = Muscle
Mixture Dielectric Constant = 54.600
Mixture Conductivity = 1.070

Comment :
Unit back edge w/antenna facing abdomen
Antenna is 2.5 cm away

Robot : MOBILE ROBOT

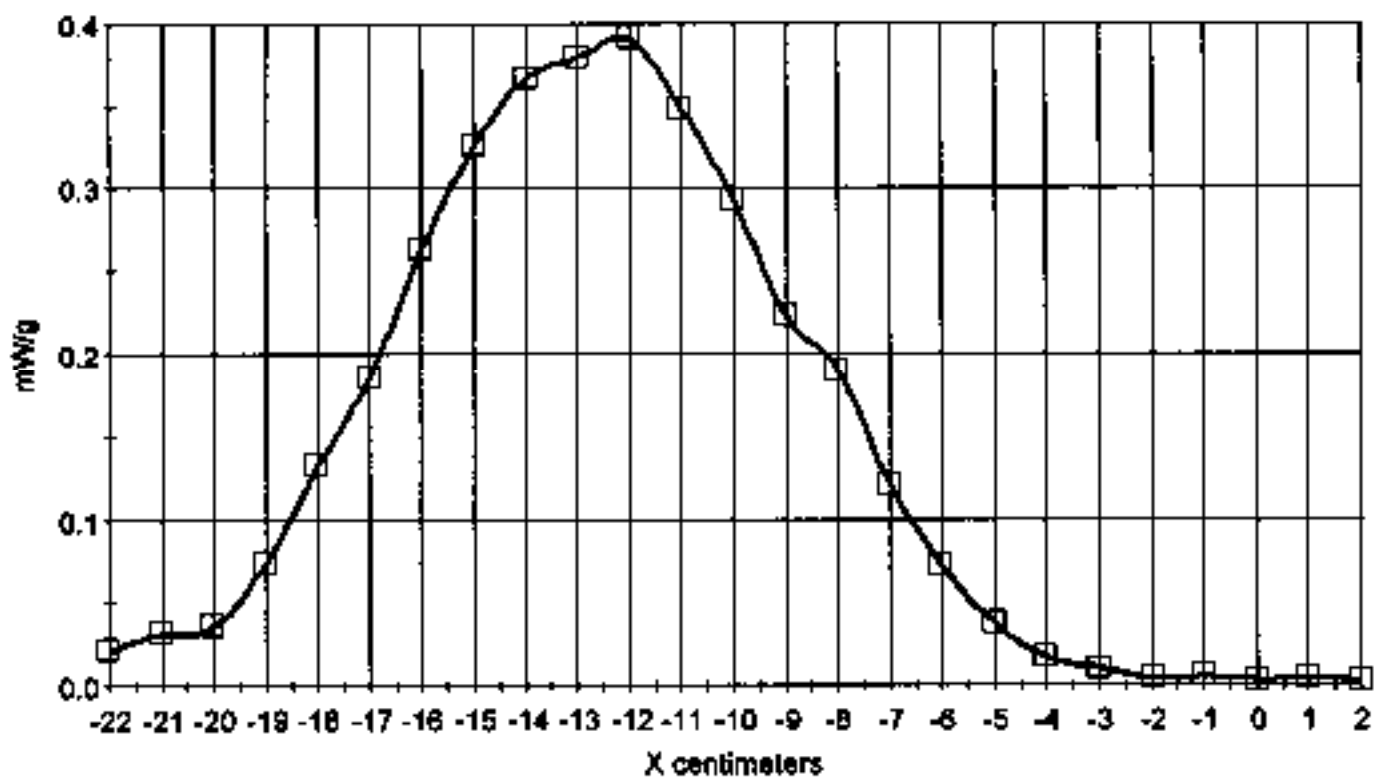
Probe Offset = 0.26 cm
Sensor Factor = 0.0109
Conversion Factor = 0.915

p041 Amplifier Channel Settings : 0.192 0.154 0.116

Max Location : X = -12.000, Y = -1.000, Z = 0.000 (cm) Value = 13.584

Area too wide. SAR value not calculated

X-Z Plane Slice Y=-4.000
File : 99032305_AREA.VLT
Start : 23-Mar-99 01:34:52 pm End : 23-Mar-99 01:57:35 pm
Fixed Wireless Terminal (FWT)/ST1056A/834GZB54V5;836.52MHz;W;Center Fed/Out;
Body/Abdomen;AREA;p041/E Field/0 DegreesMuscle/54.600/1.070
3.58



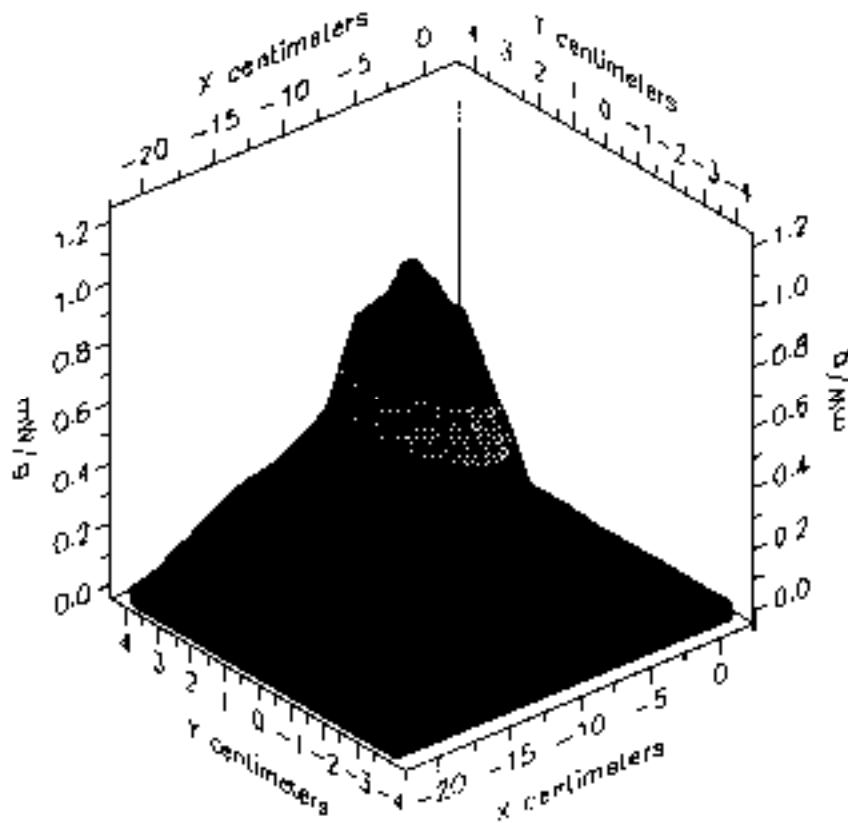
File : 99032305_AREA.VLT

Start : 23-Mar-99 01:34:52 pm End : 23-Mar-99 01:57:35 pm

Fixed Wireless Terminal (FWT)/ST1058A/834GZB54V5;836.52MHz;W;Center Fed/Out;

Body/Abdomen;AREA;p041/E Field/0 DegreesMuscle/54.600/1.070

3.58



File : 99032305_AREA.VLT

Start : 23-Mar-99 01:34:52 pm End : 23-Mar-99 01:57:35 pm

Fixed Wireless Terminal (FWT)/ST1056A/634GZB54V5;836.52MHz;W;Center Fed/Out;

Body/Abdomen;AREA;p041/E Field/0 DegreesMuscle/54.600/1.070

3.58

