MOTOROLA

## *Florida Corporate*
## *Electromagnetics Research Laboratory*

## *SAR Measurement Report*

For the compliance of Motorola Portable 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 Boomerang

Model # ACLGFS985CAA

Serial # 000C870BC

Transmitter Freq. ( MHz) 901.5

Transmitter Power (Watts) 1.242

Antenna Type internal loop

Battery Type 3V lithium & 1.5V Alkaline

Test Conditions full body; abdomen; muscle

Volume for Spatial Peak SAR Averaging ($cm^3$) 1

Spatial Peak Measured SAR Average (mW/g) 20.1

Transmitter Power Start 1.242 Transmitter Power End .940

Transmitter Peak Power .965 (time averaged over 30 min.)

Equation for max expected SAR value:

(Peak Power/Power End) x measured SAR = max expected SAR mW/g

( / ) x = mW/g

If push to talk 50% duty cycle:

max expected SAR/2 = time averaged SAR mW/g

/2 = mW/g

* See attachment for time

Observations: Unit back against phantom

Performed By : M. Kamali Date : 12/14/98

Approved By : Kamal Zakhariа Date : 12/14/98

Form Revised: July 1998

Unit back against phantom; no holster.

Calculated estimated time averaged SAR for continuous transmission using following equation:

(Upper Limit of Average Power over 30 minutes/End of test power) x Measured SAR

(.965/.940) x 20.1 = 20.6 mW/g

20.6 represents the upper limit of the estimated time averaged SAR for continuous transmision

The Boomerang signalling is system imposed, so the following steps are taken to estimate the true volume and time averaged SAR:

Unit is setup for 160ms maximum transmit length. The worst case system imposed scenario is that the Boomerang would transmit once every other frame, or once every 3.75 seconds. (1 protocol frame equals 1.875 seconds). Therefore we take 160ms and divide by 3.75 seconds.

.160/3.75= .043 derating factor due to system imposed time transmission limitations

This factor is then multiplied by the estimated time average SAR for continuous transmission to give the volume and time averaged SAR

.043 x 20.6 = .88 mW/g volume and time averaged SAR

File : c:/idx3/SYSTEM/SARMEAS3/data/Normal/98111912_ZOOM.VLT
Start : 19-Nov-98 12:26:15 pm End : 19-Nov-98 12:40:45 pm

Radio Type : Boomerang
Model Number : A06GFS9850AA
Serial Number : 00000870BC
Frequency : 901.5 MHz
Peak Trans. Pwr : .965 W (time averaged over 30 minutes)
Start Trans. Pwr: 1.242 W
Antenna Type :
Antenna Posn. : Internal
Phantom Type : Body
Phantom Posn. : Abdomen
Scan Type : ZOOM/SAR
Probe Name : 040
Field Type : E Field
Orientation : 0 Degrees

Mixture Type = Muscle
Mixture Dielectric Constant = 49.600
Mixture Conductivity = 1.180

Comment :
Unit back against abdomen; aligned parallel to the body

Robot : ROBOT

Probe Offset = 0.27 cm
Sensor Factor = 0.0108
Conversion Factor = 1.140

040 Amplifier Channel Settings : 0.183 0.166 0.123

Max Location : X = -0.500, Y = -1.750, Z = 0.000 (cm) Value = 258.187

Measured Values (volts) =
2.084E-001 9.740E-002 5.131E-002 3.077E-002 1.870E-002 1.188E-002
7.662E-003 5.068E-003 3.466E-003 2.348E-003 1.664E-003

Calc. Voltage @ Surface (Vs) = 0.3045

Voltage @ 1.00 cm (Vt) = 0.0762

Ave. Voltage (Vs+Vt)/2 = 0.1904

Ave. SAR over 1 g (mW/g) = 20.0946

SAR Scan
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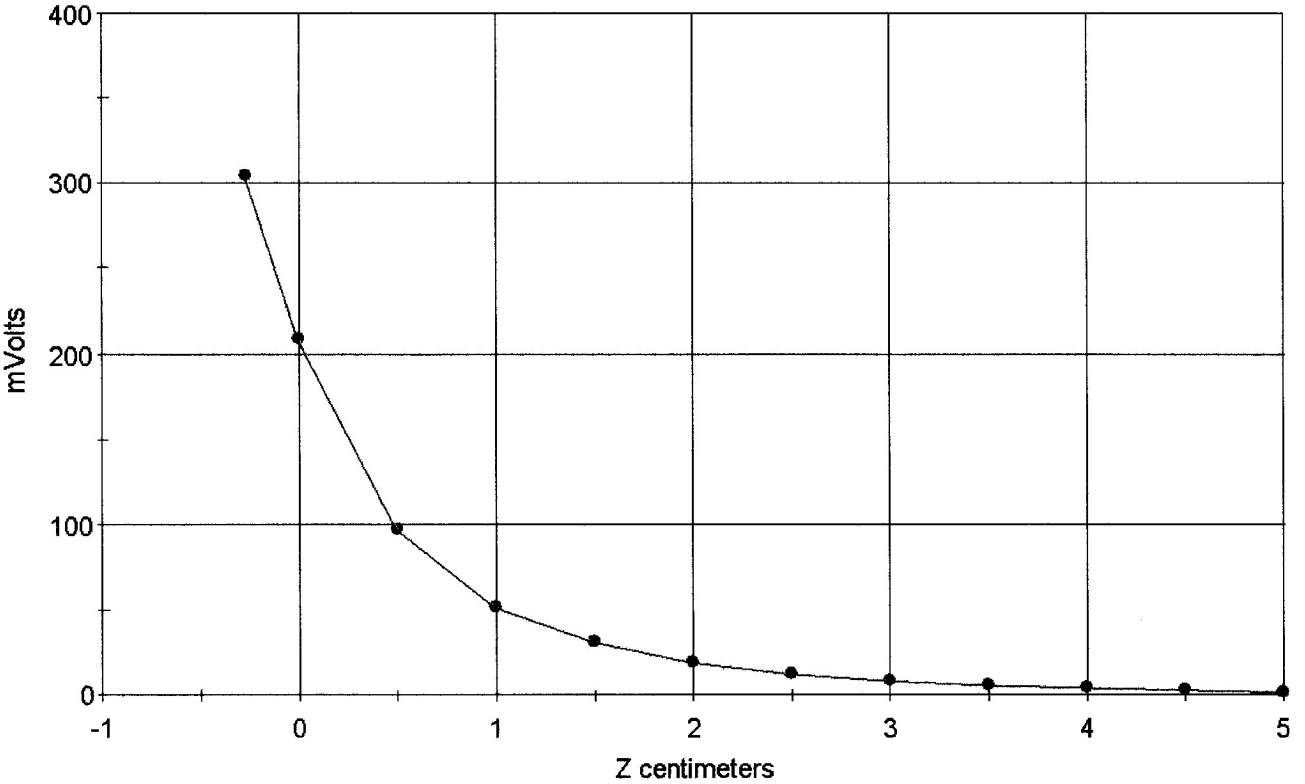
Start : 19-Nov-98 12:26:15 pm End : 19-Nov-98 12:40:45 pm
Boomerang/A06GFS9850AA/00000870BC;901.5MHz;1.242W;/Internal;
Body/Abdomen;ZOOM/SAR;040/E Field/0 DegreesMuscle/49.600/1.180



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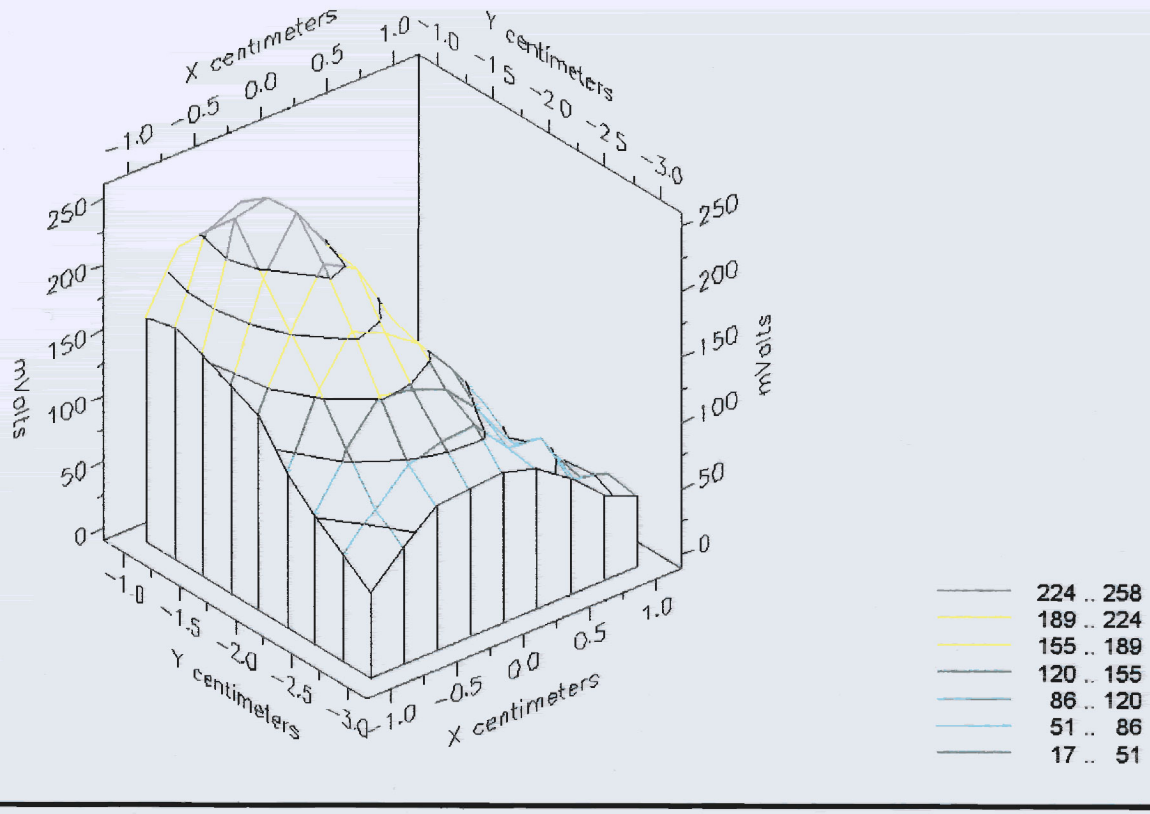

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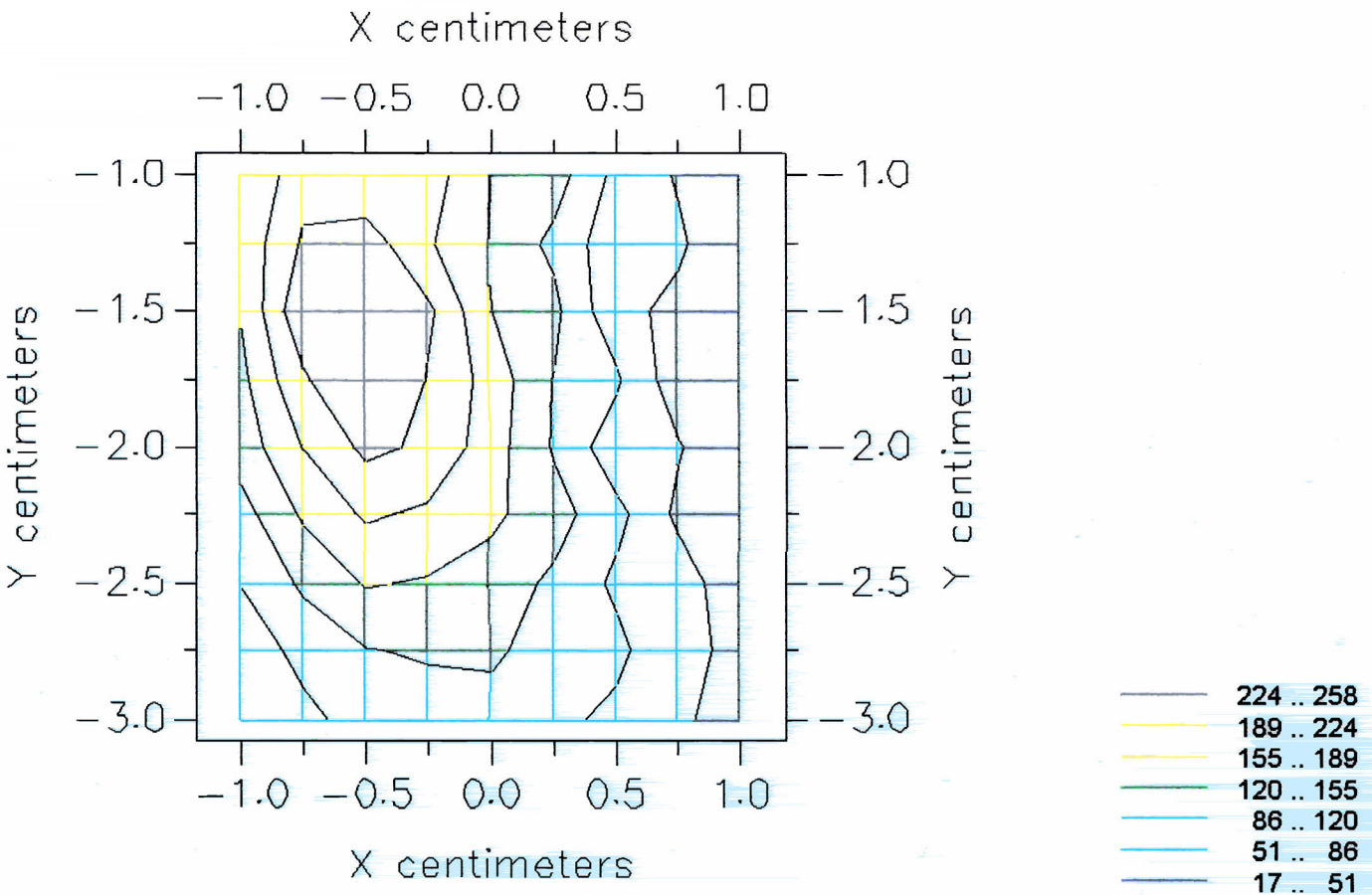

File : C:/idx3/SYSTEM/SARMEAS3/data/Normal/98111912_AREA.VLT
Start : 19-Nov-98 12:22:35 pm End : 19-Nov-98 12:26:15 pm

Radio Type : Boomerang
Model Number : A06GFS9850AA
Serial Number : 00000870BC
Frequency : 901.5 MHz
Peak Trans. Pwr : .965 W (time averaged over 30 minutes)
Start Trans. Pwr: 1.242 W
Antenna Type :
Antenna Posn. : Internal
Phantom Type : Body
Phantom Posn. : Abdomen
Scan Type : AREA
Probe Name : 040
Field Type : E Field
Orientation : 0 Degrees

Mixture Type = Muscle
Mixture Dielectric Constant = 49.600
Mixture Conductivity = 1.180

Comment :
Unit back against abdomen; aligned parallel to the body

Robot : ROBOT

Probe Offset = 0.27 cm
Sensor Factor = 0.0108
Conversion Factor = 1.140

040 Amplifier Channel Settings : 0.183 0.166 0.123

Max Location : X = 0.000, Y = -2.000, Z = 0.000 (cm) Value = 196.19

Area too wide. SAR value not calculated

X-Z Plane Slice Y=-3.000
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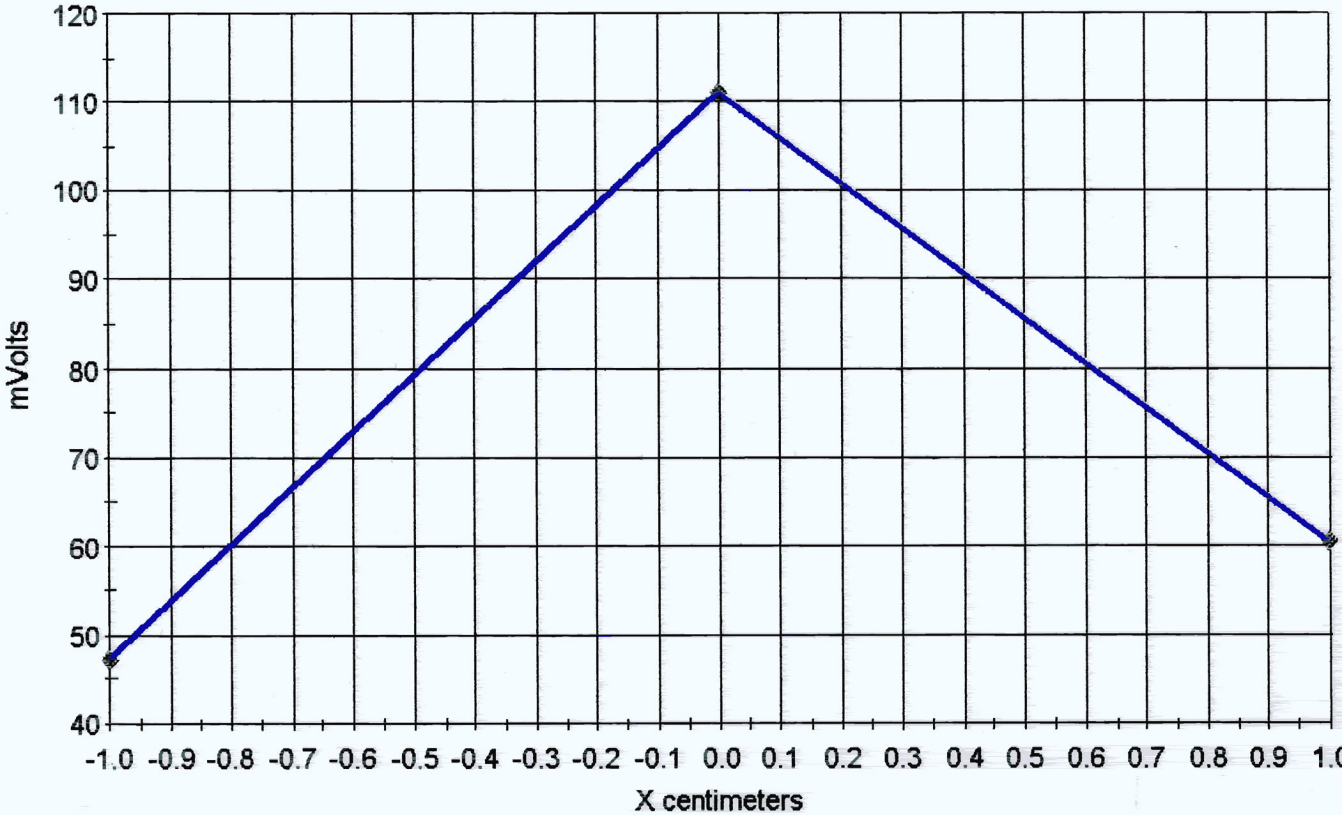

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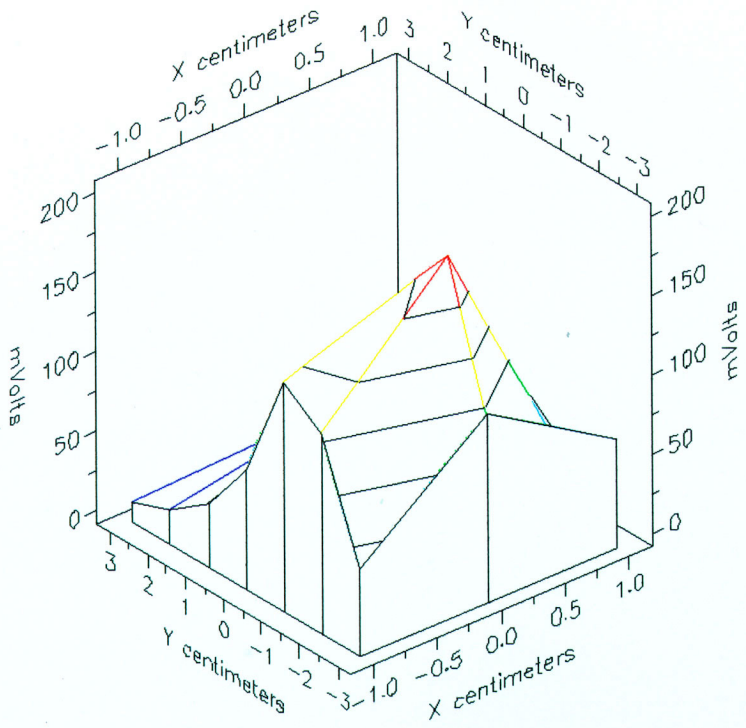

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