



January 29th, 2002

FCC ID: **AFJIC-M2A**
FCC Application Processing Branch
Correspondence Reference Number: **21737**
731 Confirmation Number: **EA940445**

Attn: **Mr. Martin Perrine**

With respect to your recent queries concerning this application, please find following the information you have requested for clarification on certain items.

- 1. For the Brain Tissue, the tissue parameters are as follows;

Tissue Parameters	Conductivity	Dielectric Constant
Target Value	0.76	52.30
Measured Value	0.81	62.58

$$SAR \text{ is defined as } SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

where:

σ = Simulated tissue conductivity,

ρ = Tissue density

From the above equation, it can be seen that SAR is directly proportional to the conductivity in a linear relationship. As the conductivity of the tissue increases, so proportionally does the SAR so for the measured tissue, a higher SAR is expected to be obtained over the target parameter by 0.81/0.76 or 6.6% higher. The dielectric constant is not directly used by this system in the calculation of local or average SAR.

- 2. For the system validation, we have just obtained an 835MHz dipole validation kit from ETS-Lindgren and have performed the system validation at 835MHz since we do not have the phantom or dipole for 150MHz and tissue and phantom parameters we have for 835MHz are within the required specifications.

835MHz Dipole Validation using 1W RF power at 15mm distance to tissue surface are:

Tissue Parameters	Conductivity	Dielectric Constant
Target Value	41.5	0.90
Measured Value	43.5	0.95
Reference SAR (1g) W/Kg	9.5	
Measured SAR (1g) W/Kg	9.7	

Attached are the area and zoom scans on the 835MHz reference dipole.

The boundary effect compensation is being implemented in the post processing code as the original software engineer that worked with Mr. Oscar Garay is Mr. Jae Wook Choi who is now at Ultratech. We are changing the code to exclude from the extrapolation algorithm, the measurement points closer than 5mm to the liquid surface. The 1mm points for the first 4mm will be extrapolated values which are then used in the volume integration to obtain the 1gram average SAR value. Further work is being conducted to determine if the Kuster method of boundary effect compensation can be employed effectively in this system and if alternate polynomial extrapolations will give a closer curve fit to the measured points. These changes will be implemented before the next SAR submission takes place.

Should there be any further clarifications required, please do not hesitate to contact me at your earliest convenience.

Best Regards,
Victor H. Kee, P.Eng

Attached.



3000 Bristol Circle,
Oakville, Ontario, Canada
L6H 6G4

Telephone (905) 829-1570
Facsimile (905) 829-8050

Website: www.ultratech-labs.com
Email: vhk.ultratech@sympatico.ca

Test Information

Date : 11/01/2002

Time : 4:46:22 PM

Product : System Validation
Manufacturer :
Model Number :
Serial Number :
FCC ID Number :

Test : SAR
Frequency (MHz) : 835
Nominal Output Power (W) : 1.0
Antenna Type : Dipole
Signal : CW

Phantom : Flat Phantom
Simulated Tissue : Brain

Dielectric Constant : 43.54
Conductivity : 0.95

Probe : UT-ETR-0200-1
Probe Offset (mm) : 2.250
Sensor Factor (mV) : 10.8
Conversion Factor : 0.974
Calibrated Date : 21/12/2001

Antenna Position : Fixed
Measured Power (W) : 1.0
(conducted)
Cable Insertion Loss (dB) : 0.0
Compensated Power (W) : 1.000

Amplifier Setting :

Channel 1 : 0.0047 Channel 2 : 0.0044 Channel 3 : 0.0055

Location of Maximum Field :

X = 0 Y = -3

Measured Values (mV) :

143.523 131.891 115.325 104.819 95.942 88.665
81.809 75.484 70.327 64.714 60.384

Peak Voltage (mV) : 175.123 1 Cm Voltage (mV) : 74.779 SAR (W/Kg) : 9.696







