5th January 2004

Mr. Robert Paxman

Intel Corporation
San Diego CA

Re: FCC ID MSQM3000N
Applicant: ASUSTek Computer, Inc.
Correspondence Reference Number: 25665
731 Confirmation Number: EA938951

Dear Mr. Paxman,

Here are the responses to the questions set by the FCC in respect to the above named project.

1) In conjunction with your user instruction on page 68 of 76 "Do not touch or move antenna....". Please instruct the user of the location of the antenna.

This has been addressed in a separate response.

2) Details of procedures for Probe calibration. If thermal cal techniques are used please makes efforts to perform wave guide calibration in the future in accordance with Supplement C.

The probe was calibrated for sensitivity in air using a horn antenna, within an anechoic chamber (rated from 2 GHz to 28 GHz) using a predetermined automated process. The controlled environment was evaluated for reflections, and then set-up with the horn antenna transmitting at a specified amplitude at a frequency range of 5.2-5.8 GHz. The amplitude of the signal from the horn antenna was then normalized so that the probe was detecting a 1 mW field. At this point measurements were then taken at each 10 degree increment for each sensor and then logged so as to determine probe sensitivity along with isotropicity. The filed intensity was then changed so as to determine the DCP for the probe at the frequencies under investigation.

A thermal and wave guide calibration method was then employed to determine the probe response while located within tissue, and from this the tissue conversion factor was derived, for each appropriate frequency.

APREL Laboratories are currently working on a paper which will be released detailing the full calibration methodology utilized for probe calibrations above 2GHz.

3) Details of measurement for dipole verification target value.

The validation numbers have been established using a model of the tuned dipole, matched with the tissue, and APREL Universal phantom. The peak SAR number along with calculated SAR in a number of other points is then assessed and inserted into a post processing model. A sequence of experimental measurements were then executed using the APREL E020 probe (which has a radius of 4.5mm) where the peak SAR was assessed at the relative co-ordinates (physical locations) relating to the FDTD analysis. Comparisons were then made, between both the experimental assessment, and the FDTD assessment. A second set of experimental assessments was executed, using the same locations, to assess the decay in SAR while moving the probe up in the Z-Axis. The experimental data along with the FDTD data was then assessed, and plotted together. Uncertainties between the two processes were then taken into account and a routine devised for calculating the 1 and 10g SAR averages.

A further set of experimental measurements was then executed using specific measurement points within a cube grid above the dipole, where the data was matched against results from the FDTD assessment. The delta's from both sets of assessments were then re-assessed and the resulting 1 and 10g averages were scaled accordingly, so that a repeatable set of target numbers could be achieved experimentally.

Further research is ongoing at APREL Laboratories with a new set of derived target values being released in line with ALSAS-10U and E-020 type probes.

4) Justification for tissue parameters used. Target values are not compliant with Supplement C. Measurement values are outside target window for both Supplement C and Aprel developed targets. Please include an analysis of the expected variation on the SAR value. Alternatively please provide data using a probe calibrated in liquid with Supplement C target value. Please provide dielectric measurements for at least one preferably two reference liquids.

The ongoing research which APREL has been conducting in respect to tissue recipes has caused us to change certain parameters, along with the ingredients, and this is why it seems that the numbers documented may reflect those for head tissues. We have been experimenting continuously in respect to the values for epsilon and sigma at the higher frequencies, and this has led to modifications to both the head and body tissues. Recently APREL have run a series of numerical analysis comparing the FCC numbers for body against the APREL numbers. The APREL models utilized the dipoles which have been developed for system validation for both head and body, at frequencies of 5.24GHz and 5.8GHz. The results from this analysis have shown that the APREL methods utilized in the assessment for SAR provide a more conservative method for SAR assessment.

It has been found that the measured values presented in the SAR report meets with the mandate for conservative SAR assessment. Any retesting of the device using the target numbers would not result in a major deviation from the SAR values recorded and would be within 5%.

Dielectric measurements executed on tissues at higher frequencies, are susceptible to temperature change. The laboratory where the SAR system is located has a maintained temperature of 22°C in line with the international requirements for a calibration facility. When dielectric measurements are made on the tissue (within the tissue manufacturing facility after preparation) the target values are always met, with a deviation of around 9% for epsilon and 7% for sigma. The ambient temperature for the tissue manufacturing facility is around 20°C and the tissue temperature is normally around 19-20°C. This can account for why there is a slight deviation in respect to the target values being met, as the epsilon and sigma values used for the SAR assessment reflect those measured for tissue which have become acclimatized to the laboratory ambient temperatures. IEEE 1528 states that the temperature for SAR tissue should be within 18-25°C to avoid uncertainties during the SAR measurements, for the higher frequencies this tolerance will have to be re-evaluated.

5) Tissue liquid recipe.

The tissue recipe used for this assessment is.

Sugar = 58.8%
Di Water = 41.0%
Cellulose = 0.1%
Preventol = 0.1%

Epsilon = 45.0 Sigma= 5.85

I trust that the above information should be enough for the FCC to proceed. If you have any further questions please let me know.

Regards,

Stuart Nicol

Director Product Development,
Dosimetric R&D.

51 Spectrum Way
Nepean, Ontario
Canada K2R 1E6

Tel (613) 820-2730
Fax (613) 820-4161

Email: info@aprel.com
HTTP://www.aprel.com