

**MOTOROLA**

Date: June 7, 1999.

Mr. George Tannahill
Federal Communications Commission Laboratory
Authorization & Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

Dear Mr. Tannahill:

Motorola Inc., 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322, is sending the following information in response to your email correspondence of June 03, 1999 for Certification application with FCC ID: AZ489FT5792 (Confirmation Number: EA93655 and Correspondence Reference Number 8066):

1. The 600 mW shown on form 731 is conducted power. The information on the Form 731 was amended via Cover Letter, dated May 20, 1999, to show that the rated power was changed and reported as Effective Radiated Power (ERP). The Form 731 should now read variable power of 0.166 to 744 milliWatt ERP.
2. The graphics for the 1-g SAR results have been shifted up, to prevent clipping during printing. The entire document will be uploaded again.
3. The 2 mm dimension in Figure 2 is the correct dimension. The 1.6 cm stated in section 1.10 is a typographical error that is related to earlier testing without the leather carry case. That error has been corrected to match Figure 2. Section 1.10. Please see this change in the uploaded document.
4. The SAR values in Table 2 for abdominal position with plastic carry holder, and facial position, represent scaled measured values. The scaled values are based on the measured values adjusted for the operational duty cycle and mode. The abdominal position with plastic carry holder data point shown in Table 2 was initially omitted from Table 1 because of it being a comparatively low measured SAR value due to the comparatively large antenna to body spacing provided by the plastic carry holder. To provide better linkage between Table 1 and Table 2, the re-submitted EME package now contains an amended Table 1 that includes the measured SAR value for the abdominal position with plastic carry holder.

The scaled 1-gram Averaged SAR is based on the following relation:

Operational Maximum Calculated 1 gram Averaged SAR = $[(A / B) \times (C \times D)]$

A = Maximum pulse average power delivered to the antenna connector under any

conditions of permissible tuning, frequency, voltage and temperature.

B = Lowest pulse average power measured at end of SAR.

C = Measured 1 gram averaged peak SAR at a duty cycle equal 16.67%.

D = Duty cycle for particular operating mode.

$D1 = D1 \times D2$.

D1 is the transmission mode duty cycle, i.e., the ratio of the user requested transmission and the tested mode.

D2 is the Push to Talk duty cycle. For 2-way radio (dispatch) = 0.5 for data and telephony = 1.

Abdomen with plastic carry holder in data mode at 67.5% duty cycle:

Operational Max. Calc. 1-gram Avg SAR = $[(0.72W/0.67W) \times 0.06 \text{ mW/g} \times (67.5\%/16.67\%) \times 1]$
= 0.26 mW/g.

Face in 16.67% duty cycle PTT dispatch mode:

Operational Max. Calc. 1-gram Avg SAR = $[(0.72W/0.67W) \times 0.11 \text{ mW/g} \times (16.67\%/16.67\%) \times 0.5]$ = 0.06mW/g.

5. The dimensions shown in Figures 1A and 1B are independent of battery thickness because the display/keypad and not the battery is in contact with the head/cheek when the radio is used in phone mode in the head position. The dimensional difference shown in figures 1A and 1B are due to the resultant location of the radio antenna base with respect to the curvature of the head, per the left and right side head alignment of the axis of the radio with a line from the center of the ear to the corner of the phantom's lips.
6. Simulated muscle equivalent tissue was used for the front of face SAR evaluation and not brain tissue because of a matter of convenience. This approach is deemed acceptable due to overstating the SAR exposure, because of the higher conductivity of the muscle tissue results in a higher measured SAR.
7. The lab's standard procedure is to measure the electrical characteristics, conductivity and dielectric constant of simulated tissue on a weekly basis to ensure that the tissue is within specification, as well as make any adjustments required. Routine simulated tissue adjustments occurred between the dates that the SAR measurements were performed which accounts for the different values observed in simulated muscle tissue conductivity and dielectric constant (as depicted on the IDX plots) for both runs.
8. The product usage information in the i500 User's Manual provides clear instructions to prevent unusual or inappropriate use of the radio that could result in exposure levels above SAR guidelines. In general, these precautions address all body-worn operating positions and include specific instructional information when the radio is used in data feature mode. These precautions are

virtually identical to precatory language previously approved by FCC.

The user is advised in the Safety and General Information section of the i500 User Manual to maintain at least a one-inch separation between the antenna and the user when the radio is being operated. This separation was found in SAR testing using the iDEN TDM protocol to be a conservative measure for ensuring compliant SAR levels for the ERP levels at which this radio product operates. This "one inch rule" thus ensures compliance with the FCC limits in 47 CFR 2.1093(d)(2). This "one inch rule" is used because it is an easily understandable and broadly applicable guide that provides clear information to the user on how to position the phone in a myriad of operational configurations, such as data transmission with a laptop computer on a table top, or body worn in holders, holsters, and carry cases.

It also clearly indicates to the user that positioning the radio so that the antenna does not maintain the one-inch separation (such as putting it in a pocket) may result in non-compliant operation.

Thus we believe that the positioning information contained in the user manual makes all users fully aware of what separation they should maintain from the radio and enables them to assess whether any planned positioning of the radio is compliant or non-compliant.

We trust that the above response meets your requirements. Please contact me at (954) 723-5793 if you require any additional information.

Regards,

Mike Ramnath
FCC Liaison
Email address: emr003@email.mot.com