Date: March 29, 2004

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

Subject: Request for Grant Based on Alternative Measurement Procedure for Certification of Transmitter with FCC ID: ABZ99FT3048

Dear Sir or Madam:

This application respectfully requests a waiver of Sections 1.1310 and 2.1091(d) of the Commission's rules. The subject transmitter was evaluated for compliance with the RF exposure limits by using both experimental measurements of field strength and computational modeling of specific absorption rates (SAR), as described below. Motorola requests that these combined data be deemed acceptable for equipment authorization of this device.

As the Office of Engineering and Technology (OET) is aware, SAR is the fundamental measure of the rate of RF energy absorption and both the scientific basis and compliance metric for the Commission's RF exposure guidelines. The MPE limits adopted by FCC—and used for RF evaluation procedures and exposure limits for mobile devices—are based on criteria quantified in terms of SAR.

The scientific validity of using SAR computational modeling, either as a complement to or in lieu of MPE evaluations, should not be in question. The Commission has already concluded that computational modeling is a scientifically valid method to evaluate RF energy absorption in humans. The Commission's Report and Order in ET Docket 93-62, FCC 96-326, 11 FCC Rcd.15123 (1996) provided "guidelines on the application of the exposure criteria to portable and mobile devices in general" (at 68). The R&O also concluded (at 70) that there were a number of "appropriate methods and techniques for determining SAR for compliance purposes," that "the use of appropriate numerical and computational techniques, such as FDTD analysis, is acceptable for demonstrating compliance with SAR values" and that "such techniques offer valid means to determine energy absorption characteristics in exposed subjects."

Although the Report and Order's acceptance of computational modeling was not expressly applied to mobile devices, the Commission's Rules allow and its technical guidance encourages approval of acceptable, up-to-date measurement procedures. Section 2.947 (a)(3) of the Rules provides the Commission general discretion to accept data gathered by "[a]ny measurement procedure acceptable to the Commission." FCC's principal technical guidance, Supplement C to OET Bulletin 65 (*Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields)* encourages the use of "up-to-date test procedures" and makes clear that "other methods and procedures may be acceptable if based on sound engineering practice."

Simply making field strength measurements and calculating MPE values may result in data that overstate the actual RF energy absorption of persons nearby the device. In the case of the subject transmitter, for example, data for ten test conditions out of a total of fifty-two suggest that applicable MPE limits could be exceeded. Upon closer analysis, however, these conditions were demonstrated to be compliant. Appendix B describes how these ten test conditions were divided into two groups—bystander exposures and passenger exposures—and analyzed with a state of the art computational modeling method to determine compliance with the specific absorption rate (SAR) limits for general public exposure (1.6 W/kg averaged over 1 gram of tissue). This particular computational modeling technique is based on commercially available Finite-Difference-Time-Domain (FDTD) methodology. The data demonstrate that the SAR values for these ten test conditions are in fact compliant with the FCC limits for general public exposure.

In summary, SAR is the fundamental measure of RF energy absorption and the scientific basis for FCC's exposure evaluation guidelines. The Commission has concluded that computational modeling of SAR is a scientifically valid method to evaluate RF absorption. The attached data show that SAR modeling provides accurate exposure evaluations that can be used to demonstrate compliance for test conditions where field strength measurements suggest non-conformance. The Commission's acceptance of computational modeling data for this device would serve the public interest by furthering the use of newer and more accurate technologies for RF exposure evaluation and by permitting the authorization of public safety radio equipment.

Sincerely,

/s/ Mike Ramnath (signed)
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