

Author Data Muhammad Dajani Masud Attayi	Date 1998-10-26	Document No. 01731-CERT-FCC-SAR- Integrator's Guide
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Introduction:

A section explaining RF exposure requirements for integrating the RIM units into other products should be added to the Integrator's Guide. A draft of this section is included here.

Compliance

Based on FCC rules⁽¹⁾ 2.1091 and 2.1093 and FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields, OET Bulletin 65 and its Supplement C⁽²⁾, all integrations of the RIM OEM unit are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use.

For portable devices, defined in accordance with FCC rules as a transmitting device designed to be used within 20 cm of the user body under normal operating conditions, RF evaluation must be based on Specific Absorption Rate (SAR) limits in Watts/kg. SAR is a measurement of the rate of energy absorption per unit mass of body tissue.

For mobile devices, defined as a transmitting device designed to be generally used such that a separation distance of at least 20 cm is maintained between the body of the user and the transmitting radiated structure, the human exposure to RF radiation can be evaluated in terms of Maximum Permissible Exposure (MPE) limits for field strength or power density in mWatts/cm².

RIM will submit module specific information and test reports for a generic MPE compliance. For an end product not covered by RIM testing and submission, the integrator will submit for a separate FCC ID. The submission should include end product information, end product SAR/MPE test report and a reference to RIM module FCC ID for all other Part 90 requirements.

Limits

1) SAR limits for General Population/Uncontrolled exposure is 1.6 W/kg for partial body exposure, averaged over 1 g of tissue and 4 W/kg for hands, wrists and feet averaged over 10 g of tissue. The limits for Occupational/Controlled exposure are more relaxed, i.e., 8 W/kg for partial body and 20 W/kg for hands, wrists and feet. The 1.6 W/kg limit applies for most of RIM OEM integrators.

2) The limit for MPE is 0.6 mW/cm² at 900 MHz.

Guidelines

RF exposure distance is based on normal operating proximity to the user's body. This distance is measured from the feed point of the antenna to the closest body part. A test need to be performed to determine the passing distance that meets the exposure limits.

(1) FCC CFR 47 Part 90, 1996

(2) OET document 65, supplement C, December 1997

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Minimum Separation Distance

For mobile configurations the MPE requirements are met by the minimum passing distance of 28 cm for Larsen, 3 dB gain ground plane mounted antenna with minimum 6 feet cable length and for Austin, 0 dBd gain ground plane mounted antenna also with minimum 6 feet cable length, the required distance is 20 cm.

For portable configurations the SAR requirements are met by the passing distance of 8 cm for The Antenna Company, Eclipse II Magnet Mount, 3 dB gain antenna scaled to zero cable length.

Operating Manual Compliance Statement

The integrator should include a statement in their operation/user/installation manual making the user aware of RF exposure issues and insuring that the users keep a passing distance from the antenna while transmitting.

Also the integrator should provide instructions or diagrams in the manual for proper antenna mounting and position, when applicable, to ensure a safe exposure distance to the operator and nearby persons.

Label

If the final device configuration cannot be controlled so as to limit the user distance to the antenna then the device needs to have an RF radiation hazard label warning the user to keep away from the antenna by the specified distance.

If the product passes the MPE limit at 20 cm then there is no need for a label on the final product.

Installation

Any vehicular equipment that integrates R901M and uses a Larsen or Austin antenna will be required to have the antennas installed at least 28 cm for Larsen and 20 cm for Austin from any edge of a vehicle rooftop.

It is mandatory for the vehicular application integrators/distributors to add a warning in their user manual to instruct the installer to mount the antenna at the center of the vehicle rooftop. As well the instructions should tell the operator/user to maintain the minimum required distance of 20 cm for Austin and 28 cm for Larsen base mounted antennas at all times.

For the Antenna Company, Eclipse II Magnet Mount antenna with 3 dB gain, all users are required to maintain the minimum separation distance of 8 cm from the antenna at all times. If the final device configuration cannot be controlled so as to limit the user distance to the antenna by more than 8 cm then the device or the antenna, requires to have an RF radiation hazard label. This way the users are warned to maintain the minimum 8 cm distance from the antenna.