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Our Ref: 01947-CERT-FCC-CORRESP_8298

June 29, 1999

Mr. Frank Coperich
Federal Communications Commission,
Equipment Authorization Division
Application Processing Branch
7435 Oakland Mills Road
Columbia, MD 21045

Subject : Response to the FCC Correspondence Reference # 8298, dated June 17, 1999 for Additional Information on RIM radio modem FCC ID: L6AR902M-2-O, 731 Confirmation # EA93744

ITEM 1: Information.

ITEM 2: Section, Gain and ERP, pp. 46-47, of the Integrator's Guide now reads ¹

Gain and ERP

Antennas produce gain by concentrating radiated energy in certain areas, and radiating less energy in other directions. The amount of gain depends on the radiation pattern, antenna match, and antenna efficiency. Antenna gain is given as a rating of the maximum increase in radiated field energy density relative to "a dipole antenna" expressed in decibels "(dBd)" of power gain.

"A dipole is a balanced antenna consisting of two radiators that are each a quarter-wavelength, making a total of a half-wavelength. The widespread use of half-wave dipole antennas at VHF and UHF has led to the use of a half-wave dipole as the reference element."

The power output of the RIM 902M is 62 mW to 2.0 W at the antenna port, and the antenna gain (or loss) will result in an increase (or decrease) in this value. The actual output is called the Effective Radiated Power, or ERP. For example, if the RIM 902M is putting out 2.0 W of power to a 2.3 "dBd" gain antenna, the ERP is $2.0 \times 10^{(2.3+10)} = 3.4$ W, the actual power radiated by the antenna in the direction of maximum gain and polarization.

¹ changes are between the "...".

ITEMS 3 & 6: Paragraph 4 of FCC Radio Frequency Exposure Rules, pp. 5-6, of the Integrator's Guide is modified and it now reads ¹

"Warning": For an end product not covered by RIM MPE testing and submission, the integrator will submit for a separate FCC ID. "It is mandatory for portable end products such as hand-held and body-worn devices to comply with FCC RF radiation requirements with respect to SAR limit." 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. RIM will submit module specific information and test reports for a generic MPE compliance.

"The three specific antennas tested with the RIM 902M radio modem for generic MPE compliance are Larsen NMO 3E 900B with 3 dBd gain, Austin 200160 500C with 0 dBd gain and Eclipse II Magnet Mount 3 dBd gain antenna. The MPE passing distance for the Larsen ground plane bolted antenna adjusted to 6 foot cable length, is 23 cm. And the passing distance for both Austin ground plane bolted and Eclipse II ground magnet mount scaled to 6 ft cable is 20 cm. The vehicular integrators of RIM 902M who use the Larsen, Austin or Eclipse II antennas, will be in compliance with MPE limit, provided that the antennas are installed at least 23 cm for Larsen and 20 cm for

Austin or Eclipse II antennas from any edge of a vehicle rooftop.

The vehicular device integrators using these antennas would be required to add a prominent warning in their user manuals to instruct the installer/end user on proper antenna mounting and antenna centering on the vehicle rooftop in compliance with MPE separation distance. Also the operator/user should be warned to maintain the minimum required distance from antenna at all times.

Integrators using the above antennas in the vehicular configurations, do not require separate FCC approval for RF exposure compliance with respect to MPE limits. However, the integrators of vehicular devices who use antennas other than the three tested by RIM or integrators of portable devices, would then be required to do separate MPE testing for vehicular/mobile applications and SAR testing for handheld/portable devices. This would require submitting for a separate FCC ID and going through the appropriate process.”

¹ changes are between the “...”.

The antenna gains are all in dBd. For Austin the original spec sheet at the end of the MPE report did indicate it as 0 dBd. For Larsen and Eclipse II antennas, confirmation from manufacturers / vendors were obtained and included at the end of this reply for your reference.

ITEM 4: Section, Guidelines, pp. 7, of the Integrator’s Guide now reads ¹

Guidelines

RF exposure distance is based on normal operating proximity to the user’s “or nearby persons” bodies. This distance is measured from “any part of a radiating structure, which is generally the antenna to the” closest body part. A set of test needs to be performed to determine the passing distance that meets the exposure limits “with respect to SAR for handheld/body worn/portable devices or MPE for vehicular/mobile devices if antennas other than the three tested by RIM are used.”

¹ changes are between the “...”.

ITEM 5: Sections, Operating Manual Compliance Statement and Label, pp. 7-8, of the Integrator’s Guide now read ¹

Operating manual compliance statement

“For the mobile/vehicular transmitter”, the integrators 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. “The integrators of mobile end products”, should provide instructions or diagrams in the manual for proper antenna mounting and positioning, when applicable, to ensure a safe exposure distance to the operator and nearby persons.

“For portable transmitters, separate FCC approval is required to be in compliance with FCC RF exposure guidelines in respect to the SAR limits.”

Label

If “the minimum separation distance of” the final device configuration “can not be met due to occasional non-essential operating conditions or requirements,” then the device needs to have an RF radiation hazard label warning the user “or nearby persons” to keep away from the antenna by the specified distance. “Compliance with respect to SAR limits which satisfy MPE limits, would not require warning labels, however, an RF radiation warning label can be used to alert the user or nearby persons about abnormal usage conditions.”

“Warning to Integrators and Users

To meet the FCC RF exposure requirement for mobile transmitter end products using the Larsen NMO 3E 900B, 3 dBd antenna, ensure that the antenna is at least 23 cm away from the user or nearby persons when transmitting.

This statement should be added by all integrators to their user manual along with proper installation instructions. The installation instructions should include, but are not limited to, the correct mounting procedures on a ground plane, and positioning the antenna such that the minimum 23 cm is kept from any edge of the vehicle rooftop.”

In the vehicular configuration, having warning labels visible to all persons as was requested by Mr. Chan’s email, is not feasible because the final device is usually not mounted in a visible location. Having the warning label in our manual and recommending integrators to add the statements to their instruction/user manuals should fulfil the FCC RF exposure compliance requirements.

¹ changes are between the “...”.

Should you have any questions please do not hesitate to call.

Sincerely yours,

A handwritten signature in black ink that reads "M. Attay". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

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Date: 6/25/99

To: RESEARCH IN MOTION
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From: Microcel Technical Services
Rick Henry
Phone: 905-853-2568
Fax: 905-853-4363

Pages: 1

Subject: Specifications for the Eclipse II Magnet Mount 9123 antenna

Masud,

The 9123 antenna is based on a European model. It is a 3dBd gain antenna with a 6 foot cable and SMA connector.

Thanks

Rick



FAX MEMORANDUM

Date/Time: Thursday, October 22, 1998/2:45 PM

To: Muhammad Dajani

Company: RIM

Fax Number: (519) 888-6906

From: Kee Hoo

Subject: VSWR plots

Total Pages: 4 (Including cover sheet)

Mr. Dajani,

Enclosed are VSWR plots for NMO 900 and NMO 3E 900. As you can see the VSWR is 1.5:1 across the entire 890-960 MHz band. The gain on these 2 antennas are 3dBd.

I am also enclosing a copy of a Reflected Power vs. Standing Wave Ratio chart for your reference. At 1.5:1, there is only 4 % reflected power from the antenna, i.e. the antenna is well matched.

Please let me know if you need any other information.

Thanks.

-Kee-

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OCT 22 '98 02:43PM LARSEN ELECTRONICS INC