



Intertek Testing Services ETL SEMKO

August 16, 2000

Federal Communications Commission
Equipment Authorization Division
Application Processing Branch
7435 Oakland Mills Road
Columbia, MD 21046

Attention: Mr. Errol Chang

Reference: Communication Network Interface, FCC ID: N79CNI-930M
Confirmation # EA97737, Reference #15324

Dear Mr. Chang:

Enclosed please find our answers to Items 1 & 2 of the information request letter received on 7/31/00 for Communication Network Interface, Inc., FCC ID: N79CNI-930M, Confirmation #EA97737, Reference #15324.

We also have noted FYI on additional operating instructions that may need to be included in the user manual as part of the RF Exposure requirements. Thank you.

Regards,


Gaspara Lim

gcl/

Enclosures

Intertek Testing Services NA, Inc.

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ITS Intertek Testing Services

ETL SEMKO

From: Ollie Moyrong, Intertek Testing Services
omoyrong@itsqs.com

To: Errol Chang
Echang@fcc.gov
FCC Application Processing Branch

Subject: Further request for Information

Re: FCC ID N79CNI-930M
Applicant: Communication Network Interface Inc.
731 Confirmation Number: EA97737
Date of Original E-Mail: 7/31/2000

Dear Mr. Errol Chang,

Below are our responses to your concerns regarding the above mentioned application:

1. Antenna gain is 0 dBi. Please see attached page titled "Antenna Again" for details.
2. The actual duty factor of the unit is 8.13%. Please see the attached page titled "Duty Factor" for details.

In the report where it states "50ms on and 64ms off", it should state "50ms on and 64ms off" as this was the actual operating mode of the unit during tests. The test report page has been corrected and is attached. Referring to the Duty Factor details as stated in the "Duty Factor" exhibit, the system has 8.13% duty cycle (26 seconds on and 320 seconds off). Our SAR measurement system is not capable of performing an accurate measurement with the unit operating at 8.13% duty cycle (26 seconds on and 320 seconds off). The SAR measurement system (model Daisy3 by SPEAG) requires the test sample to be "transmitting" approximately every 1.5 seconds for an accurate measurement. This is the reason the unit was configured for "50ms on and 64ms off" operation, for testing purposes only.

From the Data Sheets, the worst case measured SAR was 0.472 mW/g with the unit operating in the condition "50ms on and 64ms off". This data can be considered worst case because the actual duty cycle of the unit is 8.13%.

The test report pages that lists the operating mode as "7.8% unmodulated" have been corrected to reflect the actual mode of operation used. Corrected test report pages are attached.

Please notify us if you require additional clarification. Thank you.

Best regards,

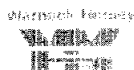
Ollie Moyrong



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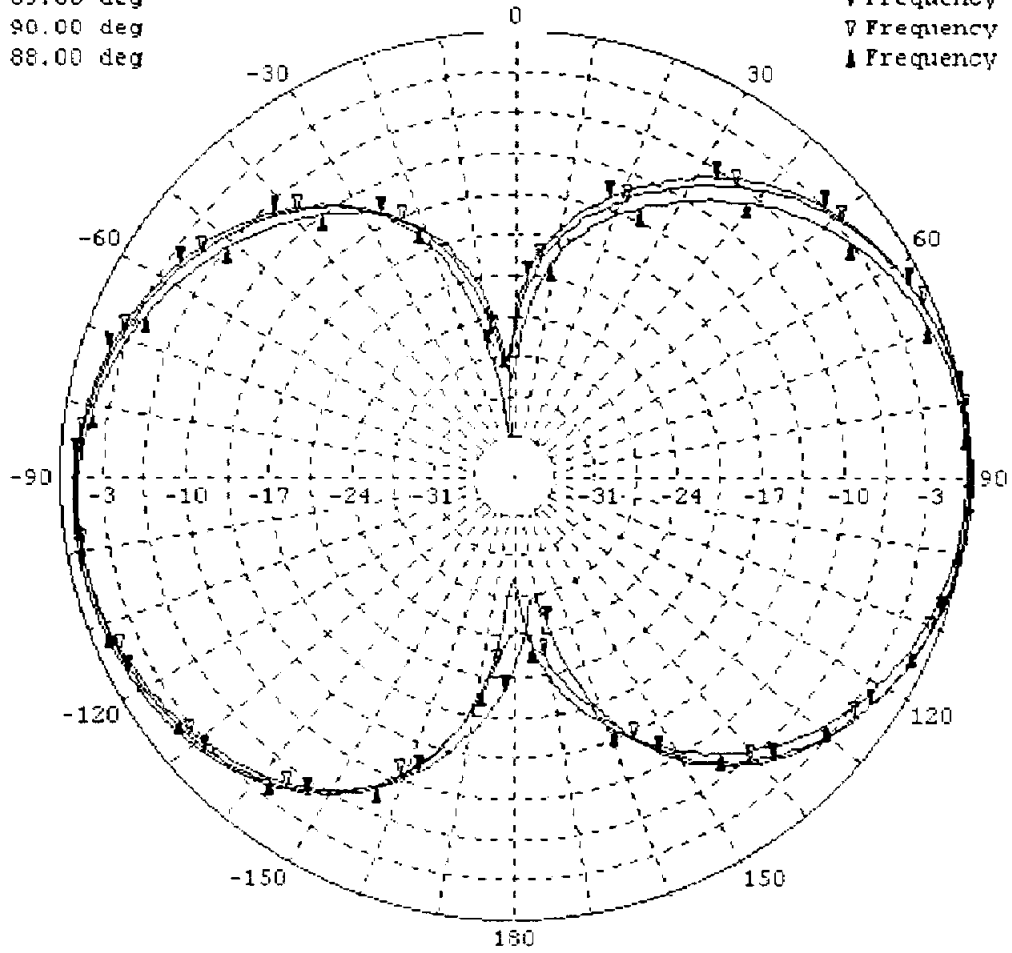


Antenna Gain

Beam Peak = 0.35 dB, 89.00 deg
Beam Peak = 0.52 dB, 90.00 deg
Beam Peak = 0.10 dB, 88.00 deg

UnClassified

V Frequency = 0.910 (Ghz)
V Frequency = 0.912 (Ghz)
▲ Frequency = 0.914 (Ghz)

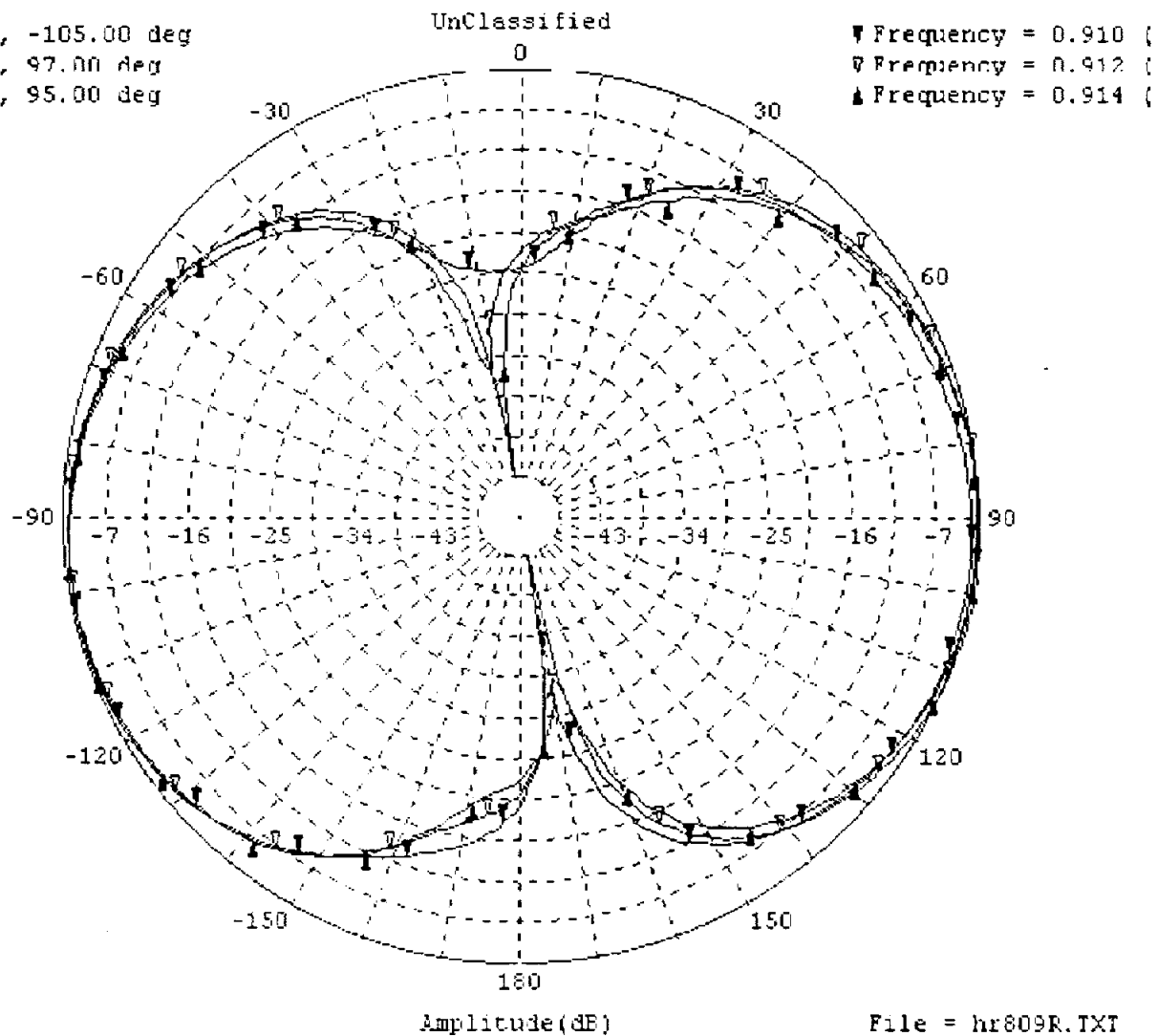


Amplitude(dB)

File = hr809E.TXT

Antenna Gain

Beam Peak = -2.37 dB, -105.00 deg
Beam Peak = -2.09 dB, 97.00 deg
Beam Peak = -2.37 dB, 95.00 deg



Duty Factor

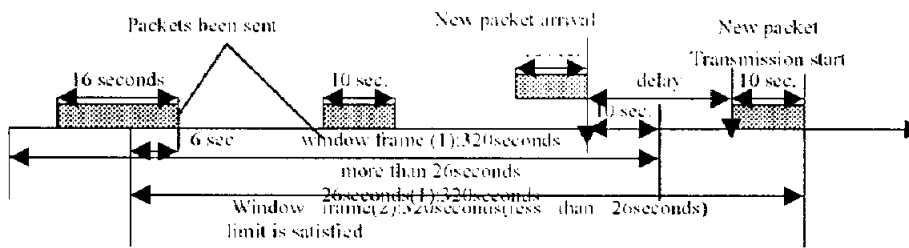
Subject: Transmission duty factor limiting for the two-way messenger model CNI-930M

The operating duty factor implemented in our two-way messenger will be limited to 8.13% to meet maximum allowable SAR requirement.

The limiting algorithm's basic idea is as follows

The basic window frame is 320 seconds. Within this window frame period, the actual transmission time will be restricted to duty factor 8.13%(26seconds). To ensure that the duty factor is limited to the maximum allowable over all network transaction, we use calculation based window averaging, not fixed duration windowed time averaging.

The following figure will detail our duty factor limiting algorithm.



As above figure details, whenever new packet transmission is required, new window frame including predefined new packet transmission time has to be determined and the duty factor for this new window frame is calculated. If the calculated duty factor is less than 8.13%(26sec.), then the packet transmission will be confirmed and transmitted immediately. But if the duty factor is more than limit, the packet transmission will be delayed until confirmation. In the figure, the duty factor calculated within window frame(1) is more than 26seconds so that the packet cannot be transmitted immediately. The packet will be delayed until new window frame is calculated and the calculated duty factor is evaluated to be less than 8.13% which is like the case of window frame(2).

As convenience, above explanation doesn't include the time for confirmation to actual transmission which is like sync search time, channel search time etc.,

Every time factors that affect duty factor calculation will be considered in the device to be marketed.

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1.4.3 Test Condition

During tests, the worst case data (max. RF coupling) was determined with following conditions:

EUT Antenna	Fixed	Orientation	N/A
Usage	Body-worn and hand-held	Distance between base of EUT and the liquid surface:	2 mm
Simulating human hand	Not Used	EUT Battery	Fully Charged
Power output	2W Conducted		

The spatial peak SAR values were accessed for lowest, middle and highest operating channels defined by the manufacturer. Tests were performed at CW mode (2W conducted). Care was taken to ensure that performance of the EUT power amplifier would not be degrade using CW test mode. A peak radiated field strength test was performed with both CW and modulated signals with the unit operating in 8.13 % duty cycle mode and special test mode of 50ms on / 64ms off. Data show that peak power output in both operation modes were the same.

Radiated emission measurement was performed, before and after the SAR tests to ensure that the EUT operated at the highest power level.

1.5 Modifications required for compliance

No modifications were implemented by Intertek Testing Services.

1.6 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standard.

2 SAR EVALUATION

2.1 SAR Limits

The following FCC limits for SAR apply to devices operate in General Population/Uncontrolled Exposure environment:

EXPOSURE (General Population/Uncontrolled Exposure environment)	SAR (W/kg)
Average over the whole body	0.08
Spatial Peak (1g)	1.60
Spatial Peak for hands, wrists, feet and ankles (10g)	4.00

2.5 Test Results

The results on the following page(s) were obtained when the device was tested in the condition described in this report. Detail measurement data and plots which reveal information about the location of the maximum SAR with respect to the device, are reported in Appendix A.

The maximum spatial peak SAR values average over 1g assessed in “touch” position was 0.472 mW/g with the EUT operating in the condition 50ms on / 64ms off. In actual usage, the average transmission is only 8.13% (please refer to the manufacturer justification in section 8 of this report). In considering the 8.13% duty cycle to the measured SAR data, the unit is in compliance with the requirements of the FCC for body requirements.

The maximum spatial peak SAR values average over 10g assessed in “touch” position was 0.288 mW/g with the EUT operating in the condition: 50ms on / 64ms off. The unit is in compliance with the requirements of the FCC for hands and feet requirements.

Trade Name: CNI	Model No.: CNI-930M
Serial No.: Unit # 1	Test Engineer: XM Yang

TEST CONDITIONS			
Ambient Temperature	23.8 °C	Relative Humidity	48 %
Test Signal Source	Test Mode	Signal Modulation	Unmodulated
Output Power Before SAR Test	2.0 W	Output Power After SAR Test	2.0 W
Test Duration	25 Min.	Number of Battery Change	Every Scan

Usage (Touch position)						
Plots Number	Channel (MHz)	Operating Mode	Position	Antenna	Measured SAR _{1g} (mW/g)	Measured SAR _{10g} (mW/g)
1	896	50ms on / 64ms off CW mode	Face up	Extended	0.308	0.159
2	896	50ms on / 64ms off CW mode	Face up	Retracted	0.194	0.0964
3	901	50ms on / 64ms off CW mode	Face up	Extended	0.360	0.148
4	901	50ms on / 64ms off CW mode	Face up	Retracted	0.190	0.0682
5	896	50ms on / 64ms off CW mode	Face down	Extended	0.472	0.288
6	896	50ms on / 64ms off CW mode	Face down	Retracted	0.353	0.137
7	901	50ms on / 64ms off CW mode	Face down	Extended	0.451	0.275
8	901	50ms on / 64ms off CW mode	Face down	Retracted	0.324	0.119

Note: a) Worst case data were reported
b) Duty cycle factor included in the measured SAR data
c) Uncertainty of the system is not included
d) Transmission duty cycle not included.