ALPS ELECTRIC CO., LTD
HEAD OFFICE :1-7, YUKIGAYA OTSUKA-CHO, OTA-KU, TOKYO, 145-8501 JAPAN
PHONE:(03)3726-1211 FACSIMILE:(03)3728-1812

COMMUNICATION DEVICES DIVISION, SOMA PLANT
1-2-1, OKINOUCHI, SOMA-CITY, FUKUSHIMA-PREF., 976-8501, JAPAN
PHONE:+81-244-35-1207 FACSIMILE:+81-244-35-1602

Date: October 18, 2003

Federal Communications Commission
Authorization and Evaluation Division
Equipment Authorization Branch
7435 Oakland Mills Road
Columbia, MD 21046

Declaration concerning RF Radiation Exposure

This transceiver is designed for vehicular Telematics applications where the module is located within the application and an external antenna used in an alternative, connected to the module through a length of coaxial cable, is located elsewhere on the vehicle.

This module,UGEA3A is defined as a mobile device of FCC Part 2 section 2.1091 (b), which states that "mobile devices are defined as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between radiating antennas and the body of the user or nearby persons."

FCC Part 2 section 2.1091 (c) specifies that "Mobile devices that operate in the .....and the Specialized Mobile Radio Service authorized under Subpart H of Part 22 of this chapter, Part 24 of this chapter, ...are subject to routine environmental evaluation for RF exposure prior to equipment authorization".

RF exposure calculations:

The following minimum separation distance between the EUT's antenna and the human body is calculated in accordance with the limits of uncontrolled exposure of FCC OET bulletin 65C below.

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

This calculation is based on the highest EIRP possible from the systems, considering maximum power and antenna gain, and considering a power density uncontrolled exposure limits.
The Friis formula used was:

$$S=P*G/4\pi R^2$$

Where;

S=Max. permissible exposure level (mW/cm^2)
P=Max. conducted output power at antenna terminal (mW)
G=Max. antenna Gain (numeric gain)
R=Minimum safe distance (cm)

Accordingly, the maximum permissible exposure (MPE) level is calculated for each antenna as follows.

1. Antenna type 1 , Manufacturer is HOKO . (twin pole type)
   (1) AMPS mode at upper frequency of cellular band, 849MHz
   S=0.57mW/cm^2 for 894MHz (f: 849MHz, f/1500=0.57): Limit value
   P=398.0mW
   G=2.24 (numeric gain)=3.5 dBi (Max. antenna Gain)
   R=20cm

   $S=398*2.24/(4\pi 20^2)=0.1774 mW/cm^2$

   (2) CDMA mode at upper frequency of cellular band, 849MHz
   S=0.57mW/cm^2 for 849MHz: Limit value
   P=200.0mW
   G=2.24 (numeric gain)=3.5 dBi (Max. antenna Gain)
   R=20cm

   $S=200*2.24/(4\pi 20^2)=0.089 mW/ cm^2$

   (3) PCS mode in 1.9GHz band
   S=1.0mW/cm^2 for 1.9GHz : Limit value
   P=200.0mW
   G=2.81 (numeric gain)=4.5 dBi (Max. antenna Gain)
   R=20cm

   $S=200*2.81/(4\pi 20^2)=0.112 mW/ cm^2$

2. Antenna type 2, Manufacturer is YOKOWO (mono pole)
   (1) AMPS mode at upper frequency of cellular band, 849MHz
   S=0.57mW/cm^2 for 849MHz: Limit value
   P=398.0mW
   G=1.07 (numeric gain)=0.3 dBi (Max. antenna Gain)
   R=20cm

   $S=398*1.07/(4\pi 20^2)=0.0847mW/cm^2$

   (2) CDMA mode at upper frequency of cellular band, 849MHz
   S=0.57mW/cm^2 for 849MHz: Limit value
   P=200.0mW
   G=1.07 (numeric gain)=0.3 dBi (Max. antenna Gain)
   R=20cm

   $S=200*1.07/(4\pi 20^2)=0.0426mW/cm^2$

   (3)PCS mode in 1.9GHz band
   S=1.0mW/cm^2 for 1.9GHz : Limit value
   P=200.0mW
   G=0.81 (numeric gain)=-0.92 dBi (Max. antenna Gain)
   R=20cm

   $S=200*0.81/(4\pi 20^2)=0.0322mW/cm^2$

Summary:
The EUT complies with RF exposure requirement of the above regulation.

Notes in instruction manual:
3.2 RF exposure compliance
This module, UGEA3A will be applied as "mobile device".
Because the external antenna of the module is intended to be placed on the location like that persons body (excluding extremities: hands, wrists, feet and legs) be a faraway from the antenna.
For example of the location: a top of the roof of an automobile.

This equipment complies with FCC radiation exposure limits set forth for at uncontrolled equipment as "mobile device".
Therefore, this module should be installed and operated with minimum distance at least 20cm between the radiator and persons body (excluding extremities: hands, wrists, feet and legs) and must not be co-located or co-operated with any other antenna or transmitter.

Sincerely,

Signature: 

Name: Masaaki Ueki
Title: Compliance Team Leader
Company: Alps Electric Co., Ltd Communication Devices Division