Test Report

ATMPE000006

RF EXPOSURE INFORMATION

Applicant

ARRISTA TECHNOLOGIES INCORPORATED

5-55 HENLOW BAY

WINNIPEG, MB, R3Y 1G4

EQUIPMENT UNDER TEST (EUT):

IDEN

BI-DIRECTIONAL SIGNAL AMPLIFIER

MODEL:

CR300

FCC ID:

P35SH2U64GG

In Accordance with

FCC PART 1

OET BULLETIN 65

1.1.1. RF EXPOSURE

Test Type:	Maximum Permissible Exposure
FCC Para No.:	1.1310, 2.1093
Tested By:	Paul Eberling
Date:	January 13, 2004

1.1.2. SPECIFICATION REQUIREMENT:

As per FCC 47CFR§1.1301; FCC OET Bulletin 65, 97-01 "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" and FCC OET Bulletin 65, Supplement C, 01-01, "Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", for transmitters operating in the 806/824 MHz range, Paragraph 1.1310 Table 1 limits maximum permissible exposure (MPE) to f/1500 mW/cm^2 for uncontrolled environments and f/300 mW/cm^2 for controlled environments.

The far field on-axis power flux density (W/m^2) is calculated using the following formula:

$$S = G\ P_T / 4\pi R^2 \qquad [6]$$

Where:

S	=	Power density (in appropriate units, e.g. mW/cm^2)
G	=	Power gain of the antenna in the direction of interest relative to an isotropic radiator
P_T	=	Power input to the antenna (in appropriate units, e.g., mW)
R	=	Distance to the center of radiation of the antenna (appropriate units, e.g., cm)

It is important to note that the power gain factor, ***G***, in Equation (1) is normally ***numeric*** gain. Therefore, when power gain is expressed in logarithmic terms, i.e., dB, a conversion is required using the relation:

$$G=10\text{^}(dB/10) \qquad [7]$$

For example, a logarithmic power gain of 14 dB is equal to a numeric gain of 25.12.

1.2. IDEN BAND (806-824MHZ) UPLINK

Article 01- Table: MPE Calculations

Output Power of the amplifier:	0.200 W maximum	
Antenna Gain: Maximum antenna gain allowed as described in user/install manual.	18dBi	
Operational Frequency:	806-824MHz	
Minimum distance (Controlled): For personnel aware of radiofrequency equipment and who are able to limit their exposure time. (Installation Technicians)	50cm Antenna mounted outdoors.	
Minimum distance (Uncontrolled): For personnel unaware of radiofrequency equipment and who are not able to limit their exposure time. (General Public)	50cm Antenna mounted outdoors	
Maximum Permissible Exposure (MPE):	**Controlled** 6 min avg 2.68 mW/cm^2	**Uncontrolled** 30 min avg 0.53 mW/cm^2
Calculated Power Density	**0.393** mW/cm^2	**0.393** mW/cm^2
Complies with MPE Limits	**Yes**	**Yes**

1.2.1. CALCULATIONS

The power density calculations follow the formula below. It is noted that the antenna used incorporates a forward gain of 18 dBi expressed as a numerical gain of 63.1 and a 3 meter cable with an attenuation factor of 1.5 dB and expressed as a numeric attenuation of 1.41. This is shown as a corrected power output value.

$$S = P_T G / 4\pi R^2 \quad (1)$$

where:
S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

S= 200 * # / (4*pi*50^2)
S= 12338 / 31415.927
S= 0.392731 mW/cm^2

1.3. iDEN BAND (851-869MHz) DNLINK

Article 02- Table: MPE Calculations

Output Power of the amplifier:	0.030W (30mW) maximum	
Antenna Gain: Maximum antenna gain allowed as described in user/install manual.	9dBi	
Operational Frequency:	851-869MHz	
Minimum distance (Controlled): For personnel aware of radiofrequency equipment and who are able to limit their exposure time. (Installation Technicians)	20cm Antenna mounted indoors.	
Minimum distance (Uncontrolled): For personnel unaware of radiofrequency equipment and who are not able to limit their exposure time. (General Public)	20cm Antenna mounted indoors	
Maximum Permissible Exposure (MPE):	**Controlled** 6 min avg 2.83mW/cm^2	**Uncontrolled** 30 min avg 0.56mW/ cm^2
Calculated Power Density	**0.040** mW/cm^2	**0.040** mW/cm^2
Complies with MPE Limits	**Yes**	**Yes**

1.3.1. CALCULATIONS

The power density calculations follow the formula below. It is noted that the antenna used incorporates a forward gain of 9 dBi expressed as a numerical gain of 7.95 and a 3 meter cable with an attenuation factor of 1.5 dB and expressed as a numeric attenuation of 1.41. This is shown as a corrected power output value.

$$S = P_T G / 4\pi R^2 \qquad (1)$$

where:
S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

S= 30 * 7 / (4*pi*20^2)
S= 196.2 / 5026.548
S= 0.039033 mW/cm^2