FCC Part 24 Transmitter Certification Test Report

FCC ID: SO4YX500-PCS

FCC Rule Part: CFR 47 Part 24 Subpart E

ACS Report Number: 04-0364-24E

Manufacturer: Wireless Extenders
Equipment Type: PCS Band Bi-Directional Booster
Model: YX500-PCS

RF Exposure Information

General Information:

Applicant: Wireless Extenders
ACS Project: 04-0364
FCC ID: SO4YX500-PCS
Device Category: Mobile
Environment: General Population/Uncontrolled Exposure

Technical Information:

The uplink antenna is attached to the booster using the supplied 35 feet of RG-6 coaxial cable. This 75 ohm cable has an average measured cable loss of 3.4 dB at 1850 MHz. The most common supplied antenna for this product will be a custom designed omni-directional antenna with a maximum of 7 dBi of antenna gain, and 75 ohms impedance. Maximum EIRP for this antenna would be: 23.66 – 3.4 + 7 = 27.26 dBm.

An optional antenna will be a directional antenna with a maximum gain of 12.5 dBi, and 50 ohms impedance. This antenna will likely be supplied with an additional 15 dB of cable, which would add an additional 1.5 dB of cable loss. Further, the mismatch between the 75 ohm coaxial cable and the 50 ohm antenna would result in a minimum of .2 dB of additional loss. Maximum EIRP for this antenna would be: 23.66 – 3.4 –1.5 -.2 + 12.5 = 31.06 dBm.

Antenna Gain (omni-directional collinear): 7.0 dB
Antenna Gain (directional patch/yagi): 12.5 dB
Minimum Cable/System Attenuation: 3.6 dB @ 1850 MHz
Resulting Maximum Antenna Gain: 8.9 dBi
Maximum Transmitter Conducted Power: 23.66 dBm
Maximum System EIRP: 32.56 dBm / 1.80 W
Operating Configuration: Uplink (Outdoor Antenna Fixed), Downlink (Indoor Antenna Mobile)
Exposure Conditions: 20 centimeters

MPE Calculation

The minimum separation distance is calculated as follows:

$$E(V/m) = \frac{\sqrt{30xPxG}}{d} \qquad \text{Power Density: } P_d = (mW/cm^2) = \frac{E^2}{3770}$$

MPE Distance

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*					
Transmit Freq. (MHz)	**Radio Power (dBm)**	**Radio Power (W)**	**Antenna Gain (dBi)**	**Antenna Gain (mW eq.)**	**MPE Distance (cm)**
1850	23.66	0.232	8.9	7.76	11.98

Note: In order to provide maximum MPE, calculations were performed for the highest measured power output and antenna gain with the minimum cable/system attenuation.

Installation Guidelines

The installation manual contains the following text advising how to install the equipment to maintain compliance with the FCC RF exposure requirements:

"RF Exposure (Intentional Radiators Only)
In accordance with FCC requirements of human exposure to radiofrequency fields, the radiating element shall be installed such that a minimum separation distance of (20cm) is maintained between the radiating element and the general population."

Conclusion

This device complies with the MPE requirements by providing adequate separation between the device, any radiating structure and the general population.