

Clenney Communications, Inc

RF Statement for RBS-CB

RF Exposure Requirements

General information:

Device category: Fixed

Environment: Uncontrolled Exposure

Mobile devices that operate under Part 95 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if they operate at frequencies of 1.5 GHz or below and their effective radiated power (ERP) is 1.5 watts or more. However, compliance with the power density limits of 1.1310 is not required.

Antenna:

The antenna typically used for this application is a Solarcon A-99 with 9.9 dBi of gain. The application is a fixed application with the antenna mounted approximately 42 feet above the ground and 36 feet from the highway. The value of 9.9 represents the most extreme case and will be used in the equations to follow.

Configuration: Fixed

Antenna: Solarcon or equivalent

Type: Omni

Duty Cycle: 50%

Maximum Gain: 9.9 dBi

Operating configuration and exposure conditions:

The conducted output power is 4. Watts. The maximum duty cycle is set as a function of talking versus listening and is taken at 50 %.

Part 2.1091 states that devices are excluded from routine evaluation if the EIRP is less than 2.46Watt (or 1.5WERP).

Fixed Operation: A typical fixed installation consists of an antenna system with a coaxial cable of the type RG 58/U which has a loss of 1.0 dB for a length of 60 feet.

MPE Calculation:

The minimum separation distance is calculated as follows:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

The limit for a uncontrolled/ general population exposure environment below 30 MHz is 180/f²

mW/cm².

Channel frequency: 27 MHz

The conducted power output is 4. Watts

The coax loss was taken as 1.0 dB.

Antenna gain was taken as 9.9 dBi

50% talk time in 30 minutes

W=4 power in watts D:=1 Duty factor in decimal (1 =100%) 1 for FM

Peak-antenna gain E:=exposure time in minutes, U=30 for uncontrolled

Wexp=W*D*(E/U) = 2 watts PC:=(E/U)*100; PC=50% on time

Po=2000mW f:=27 s:=180/(f*f)= .247mW/cm² Per 47 CFR1.1310

dBd=dBi-2.15=7.75

G1=dBd+2.15=9.9 dBi

CL (cable loss)=1.0db

G=G1-CL=8.9dBi

Gn=10^(G/10) power=10^{.89}= 7.76

$$R := \sqrt{\frac{(P_o \cdot G_n)}{(4 \cdot \pi \cdot S)}}$$

((2000*7.76)/(4*3.14*.247))^{1/2}

(15520/3.1)^{1/2}=70.75 cm required for compliance
minimum actual)

2.3 feet separation (42

Summary: The device complies with the MPE requirements by providing a safe separation distance of 42 feet between the antenna, including any radiating structure, and any persons when normally operated. This is based on a typical installation and an antenna with 9.9 dBi of gain. This device is approved with emissions having a source-based time-averaging duty factor not exceeding 50%.