RF Exposure

The CBHP1900 (1900 MHz) single band RF Compensator is operated as a signal booster as defined in 2.1091(b) based on its design and installation. The compensator is installed in such a way that it is physically secured and is generally located more than 20 cm from the end-user. This information is included in the user manual. It is suggested that the antenna be installed such that there is at least 20 cm of separation between user and the antenna.

RF Exposure – MPE Calculations

Input

Transmitter Power:	664mW	@ 1850-1910MHz	(Uplink)
	566mW	@ 1930-1990MHz	(Downlink)
Antenna Gain:	3 dBi all cases		
Cable loss:	2.5 dB @ 1850–1910 MHz and 1930-1990MHz		
Frequency range:	1850-1910MHz		(Uplink)
	1930-1990MHz		(Downlink)

Assumptions

1. A single ¼ wavelength radiating antenna is assumed.

2. Closest exposure distance is assumed to be 20 cm

RF Exposure – MPE Calculations

Calculations for Uplink

The following results shall be assumed to be accurate for the far-field only. These predictions will over-estimate power density in the near–field. Based on the use of a ¼ wavelength radiator, a distance of 20 cm is considered to be in the far-field for all cases.

$S = PG/4*PI*R^2$

1850 – 1910 MHz

P is 664 mW
G is 0.5 dBi (Antenna gain – loss) or $10^{(0.5/10)}$ or 1.12 Numerical
R is 20 cm

$S = 0.148292 mW/cm^2$

For Occupational/Controlled Exposure
From 1,500 to 100,000 MHz, power density limit is **5 mW/cm^2 for 6 minutes.**

For General Population/Uncontrolled Exposure
From 1,500 to 100,000 MHz, power density limit is **1 mW/cm^2 for 30 minutes.**

Conclusion: **Meets MPE limits**

RF Exposure – MPE Calculations

Calculations for Downlink

The following results shall be assumed to be accurate for the far-field only. These predictions will over-estimate power density in the near–field. Based on the use of a ¼ wavelength radiator, a distance of 20 cm is considered to be in the far-field for all cases.

$S = PG/4*PI*R^2$

1930 – 1990 MHz

P is 566 mW
G is 0.5 dBi (Antenna gain – loss) or $10^{(0.5/10)}$ or 1.12 Numerical
R is 20 cm

$S = 0.126406 mW/cm^2$

For Occupational/Controlled Exposure
From 1,500 to 100,000 MHz, power density limit is **5 mW/cm^2 for 6 minutes.**

For General Population/Uncontrolled Exposure
From 1,500 to 100,000 MHz, power density limit is **1 mW/cm^2 for 30 minutes.**

Conclusion: **Meets MPE limits**