FCC §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for Occupational/Controlled Exposure

Limits for occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	6
1.34-30	1842/f	4.89/f	*($900/f^2$)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5.0	6

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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
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, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency Range (MHz)	Antenna Gain		Conducted Power	Evaluation Distance (cm)	Power Density (mW/cm^2)	Strictest MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(mW)			
400-470	5.5	3.55	26240.375	80	1.16	1.33

Note: The rated max tune-up output power is 47.2dBm(52480.75mW), 50% duty cycle was used in evaluation, so the power is 26240.375mW

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Simultaneous transmitting consideration: (referring to the bluetooth report, the highest MPE is 0.0001mW/cm^2)

The ratio=MPE/limit$_{TNB}$+MPE/limit$_{DSS}$=1.16/1.33+0.0001/1=0.8723＜1.0

Result: Compliance. The device meets MPE requirement for Occupational/Controlled use at 80cm distance.