COMPATIBLE ELECTRONICS

MAXIMUM PERMISSIBLE EXPOSURE FOR SUBPART C 2.4 GHz BAND
802.11 b/g portion

Calculations

Power density at the specific separation:

$$S = PG/(4R^2\pi)$$
$$S = (135.52 * 1.585) / (4 * 20^2 * \pi)$$
$$S = 0.04273 \text{ mW/cm}^2 \text{ (at 20 cm)}$$
$$\text{Limit} = 1 \text{ mW/cm}^2$$

where

S = Maximum power density (mW/cm^2)
P = Power input to the antenna (mW) – 21.32 dBm
G = Numeric power gain of the antenna
R = distance to the center of the radiation of the antenna (20 cm = limit for MPE)

The maximum permissible exposure (MPE) for the general population is 1 mW/cm^2.

The power density at 20 cm does not exceed the 1 mW/cm^2. Therefore, the exposure condition is compliant with FCC rules.

The numeric gain (G) of the antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} \text{ (dB antenna gain/10)}$$
$$G = \text{Log}^{-1} \text{ (2 dBi/10)}$$
$$G = 1.585$$

MAXIMUM PERMISSIBLE EXPOSURE FOR SUBPART C 2.4 GHz BAND
Bluetooth Portion

Calculations

Power density at the specific separation:

$$S = PG/(4R^2\pi)$$
$$S = (3.155 * 1.585) / (4 * 20^2 * \pi)$$
$$S = 0.00099485 \text{ mW/cm}^2 \text{ (at 20 cm)}$$
$$\text{Limit} = 1 \text{ mW/cm}^2$$

where

S = Maximum power density (mW/cm^2)
P = Power input to the antenna (mW) – 4.99 dBm
G = Numeric power gain of the antenna
R = distance to the center of the radiation of the antenna (20 cm = limit for MPE)

The maximum permissible exposure (MPE) for the general population is 1 mW/cm^2.

The power density at 20 cm does not exceed the 1 mW/cm^2. Therefore, the exposure condition is compliant with FCC rules.

The numeric gain (G) of the antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} \text{ (dB antenna gain/10)}$$
$$G = \text{Log}^{-1} \text{ (2 dBi/10)}$$
$$G = 1.585$$

COMPATIBLE ELECTRONICS

MAXIMUM PERMISSIBLE EXPOSURE FOR SUBPART C 2.4 GHz BAND
Adding of the 802.11 b/g and Bluetooth when both are operating

The worst case Maximum Power Density is: 0.04372485 mW/cm^2 (0.04273 mW/cm^2 + 0.00099485 mW/cm^2). This is based on assuming both the 802.11 b/g and Bluetooth transmitters are on at the same frequency and all of the signal is going in the same direction.