

## Compliance with 47 CFR 15.247(i)

*“Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.”*

In the following configurations, the radios will only be used with a separation distance of 20 centimeters or greater between the antenna and the body of the user or nearby persons and can therefore be considered a mobile transmitter per 47 CFR 2.1091 (b). The following MPE estimates are valid for a CK60 handheld computer docked in a 6820 printer. The 6820 printer includes a Bluetooth radio; the CK60 computer includes a Bluetooth radio and an 802.11 radio.

The radios can transmit simultaneously. Each radio transmits through its own antenna. The radios are subject to routine RF evaluation to the General Population/Uncontrolled Exposure limits of 1.1310.

The MPE estimates are as follows:

Table 1 in 47 CFR 1.1310 defines the maximum permissible exposure (MPE) for the general population. The exposure level at a 20 cm distance from the EUT's transmitting antenna is calculated using the general equation:

$$S = (PG)/4\pi R^2$$

Where: S = power density (mW/cm<sup>2</sup>)

P = power input to the antenna (mW)

G = numeric power gain relative to an isotropic radiator

R = distance to the center of the radiation of the antenna (20 cm = limit for MPE estimates)

PG = EIRP

Solving for S, the maximum power densities 20 cm from the transmitting antennas are summarized in the tables on the following pages:

**MPE Estimates for Self Co-located Device**

**FCC ID: EHABTS080-1**

Bluetooth Radio in 6820

Antenna Type	Antenna Part No.	Transmit Frequency (MHz)	Max Peak Conducted Output Power (mW)	Antenna Gain (dBi)	Minimum Antenna Cable Loss (dB)	Power Density @ 20 cm (mW/cm <sup>2</sup> )	General Population Exposure Limit from 1.1310 (mW/cm <sup>2</sup> )	Ratio of Power Density to the Exposure Limit
Integral	PCB Trace	2400	13.86	-1.23	0	0.00208	1.000	0.002

Worst Case Ratio of Power Density to the Exposure Limit = 0.002

**FCC ID: HN2-BTM311**

Bluetooth radio in CK60

Antenna Type	Antenna Part No.	Transmit (MHz)	Max Peak (mW)	Antenna Gain (dBi)	Minimum (dB)	Power (mW/cm <sup>2</sup> )	General (mW/cm <sup>2</sup> )	Ratio of Power
Inverted F Chip	AH104F245001-T	2400	8.69	2	0	0.00274	1.000	0.003

Worst Case Ratio of Power Density to the Exposure Limit = 0.003

**FCC ID: EHA802UIAG**

802.11 radio in CK60

Antenna Type	Antenna Part No.	Transmit (MHz)	Max Peak (mW)	Antenna Gain (dBi)	Minimum (dB)	Power (mW/cm <sup>2</sup> )	General (mW/cm <sup>2</sup> )	Ratio of Power
Flex Circuit	N/A	2400	45.2	2	0	0.01425	1.000	0.014
Flex Circuit	N/A	5250	17.24	4	0	0.00862	1.000	0.009

Worst Case Ratio of Power Density to the Exposure Limit = 0.014

**Worst Case Co-located Exposure Condition in of 6820 and CK60**

Per Note 24 shown below, the Sum of Worst Case Power Ratios cannot exceed 1.0

Bluetooth Radio Worst Case Ratio of Power Density to the Exposure Limit	Bluetooth Radio Worst Case Ratio of Power Density to the Exposure Limit	802.11 Radio Worst Case Ratio of Power Density to the Exposure Limit		Sum of Worst Case Ratios (Power Density to the Exposure Limit)	FCC Limit for Sum of Worst Case Ratios
0.002	0.003	0.014		0.019	1.0

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The results shown in the above table are equivalent to the Sum of the EIRP of the Two Co-located Transmitters (EIRP TX1 + EIRP TX2) compared to the exposure limit. The benefit of this method, is that accounts for transmitters operating at different frequencies against different exposure limits.

## Excerpts from TCB Training, April 3, 2002, “Mobile Transmitters”, Slide 6:

*“Devices operating in multiple frequency bands*

- *When RF exposure evaluation is required for TCB approval*
  - *Separate antennas – estimated minimum separation distances may be considered for the frequency bands that do not require evaluation or TCB approval, however, the estimated distance should take into account the effect of co-located transmitters. (Note 24)*

*Note 24 According to multiple frequency exposure criteria, the ratio of field strength or power density to the applicable exposure limit at the exposure location should be determined for each transmitter and the sum of these ratios must not exceed 1.0 for the location to be compliant.”*

The sum of the ratios (power density to the exposure limit) does not exceed 1.0; therefore, the exposure condition is compliant with FCC rules.