

PocketBook 903 Collocated Mobile RF Safety Evaluation

1 RF Exposure Limits and Equations

According to FCC CFR 47 §1.1310, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

Table 1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits For Occupational / Control Exposures (f = frequency)				
30-300	61.4	0.163	1.0	6
300-1500	...	...	f/300	6
1500-100,000	...	...	5.0	6
(B) Limits For General Population / Uncontrolled Exposure (f = frequency)				
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

Friis transmission formula:

$$P_d = (P_{out} * G) / (4\pi R^2)$$

Where,

P_d = power density (mW/cm²)

P_{out} = output power to antenna (mW)

G = gain of antenna in linear scale

R = distance between observation point and center of the radiator (cm)

2 MPE Calculations

2.1 Stand Alone Transmitter Calculations

The MPE calculations for standalone transmitters at a separation distance of 20 cm are shown in Table 2.

For frequency dependent limits, the lowest transmitter frequency was used to represent the lowest MPE limit (e.g. 824MHz = 0.549 mW/cm²).

The WLAN power levels listed represent the worst-case values for the corresponding frequency ranges associated with the grants listed in Section 1.1.

Table 2 WWAN and WLAN Standalone MPE Calculations

Technology	Frequency (MHz)	Maximum Conducted Power (dBm)	Conducted Power (W)	Maximum Antenna Gain (dBi)	Duty Cycle	Average EIRP (dBm)	Average EIRP (W)	Power Density @ 20cm (mW/cm ²)	FCC MPE Limit (mW/cm ²)
CDMA2000	824	29.84	0.963	-3.36	1.00	25.42	0.348	0.088	0.549
CDMA2000	1850	29.33	0.857	2.27	1.00	24.88	0.307	0.287	1.000
WLAN	2400	21.5	0.307	3.13	1.00	24.63	0.620	0.057	1.000

2.2 Collocated MPE Calculations

When using a wireless connection the following priorities are used when content is required:

- (a) By WiFi, if a WLAN is available
- (b) By the cellular network if WiFi is not available.

Wi-Fi and 3G module can't work simultaneous, user must choose which type of connection use for access to internet, so no co-location issue aroused.

PocketBook903 Antenna location

