FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to FCC 15.247(i) and subpart §1.1307(b)(1), 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 level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled 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)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

MPE Calculation

Predication of MPE limit at a given distance

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

S = power density (in appropriate units, e.g. mW/cm2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Radio	Freq. (MHz)	MPE Limit (mW/cm^2)	Output Power (mW)	Duty Cycle	Antenna Gain (dBi)	Antenna Gain (Number)	Power Density at 20 cm	% of MPE at 20 cm
Bluetooth	2402	1.0	1.14	100%	2.6	1.8	0.0004	0.04%
GPRS 8	824	0.549	1749.85	12.5%	0	1	0.04	7.29%
	1850	1.0	1205.04	12.5%	-1.0	0.79	0.06	6%
GPRS 10	824	0.549	572.80	25%	0	1	0.06	10.93%
	1850	1.0	1099.01	25%	-1.0	0.79	0.02	2%
GPRS 12	824	0.549	990.83	50%	0	1	0.04	7.29%
	1850	1.0	690.24	50%	-1.0	0.79	0.05	5%
WCDMA (Band V)	824	0.549	185.35	100%	0	1	0.04	7.29%
WCDMA (Band II)	1850	1.0	183.65	100%	-1.0	0.79	0.03	3%

The MPE calculations in the spreadsheet above demonstrates that the combination of the Bluetooth with the GPRS/WCDMA radio defined meets the MPE requirement stated in FCC Part 1.1310 at the 20 cm distance required for mobile exposure conditions.