Maximum Permissible Exposure

According to §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. According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	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

Remark: For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20cm, even if the calculation indicate that the MPE distance would be lesser.

Test Data Predication of MPE limit at a given distance

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

Where: S = power density (in appropriate units, e.g. mW/cm2)

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)

GSM 850

Maximum peak output power: 32.5 (dBm) and average output power: 31.06(dBm)

Prediction distance: >20 (cm)

Predication frequency: 848.8 (MHz)

Antenna Gain: 2.00 (numeric antenna gain）

The worst case is power density at predication frequency at 20 cm: 0.507 (mW/cm2)

MPE limit for at prediction frequency: 0.566 (mW/cm2)

PCS 1900

Maximum peak output power: 29.50 (dBm) and average output power: 27.38(dBm)

Prediction distance: >20 (cm)
Predication frequency: 848.8 (MHz)
Antenna Gain: 2.00 (numeric antenna gain）

The worst case is power density at predication frequency at 20 cm: 0.217 (mW/cm2)
MPE limit for at prediction frequency: 1.000 (mW/cm2)