

**** MPE Calculations for GSM 850****

The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G	Where,
EIRP = 31.8 dBm + 2dBi	P = Power input to the antenna (mW)
EIRP = 33.8 dBm	G = Power gain of the antenna (dBi)

Power density at the specific separation:

$S = PG / (4R^2 \pi)$	Where,
$S = (1513.56 * 1.58) / (4 * 20^2 * \pi)$	S = Maximum power density (mW/cm ²)
$S = 0.4775 \text{ mW/cm}^2$	P = Power input to the antenna (mW)
	G = Numeric power gain of the antenna
	R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm².

The power density does not exceed the 1 mW/cm² limit.

Therefore, the exposure condition is compliant with FCC rules.

Estimated safe separation:

$R = \sqrt{PG / 4 \pi}$	Where,
$R = \sqrt{(1513.56 * 1.58 / 4 \pi)}$	P = Power input to the antenna (mW)
$R = 13.82 \text{ Cm}$	G = Numeric power gain of the antenna
	R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

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

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

$$G = \text{Log}^{-1} (2 / 10)$$

$$G = 1.58$$

**** MPE Calculations for GSM 1900 ****

The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G	Where,
EIRP = 29.3 dBm + 1dBi	P = Power input to the antenna (mW)
EIRP = 30.3 dBm	G = Power gain of the antenna (dBi)

Power density at the specific separation:

$S = PG / (4R^2 \pi)$	Where,
$S = (851.14 * 1.26) / (4 * 20^2 * \pi)$	S = Maximum power density (mW/cm ²)
$S = 0.2113 \text{ mW/cm}^2$	P = Power input to the antenna (mW)
	G = Numeric power gain of the antenna
	R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm².

The power density does not exceed the 1 mW/cm² limit.

Therefore, the exposure condition is compliant with FCC rules.

Estimated safe separation:

$R = \sqrt{PG / 4 \pi}$	Where,
$R = \sqrt{(851.14 * 1.26 / 4 \pi)}$	P = Power input to the antenna (mW)
$R = 9.24 \text{ Cm}$	G = Numeric power gain of the antenna
	R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

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

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

$$G = \text{Log}^{-1} (1 / 10)$$

$$G = 1.26$$