

CC Maximum Permissible Exposure (MPE) limits for equipment operating in the frequency range 1500 – 100,000 MHz is 1.0 mW/cm<sup>2</sup>.

Following installation and commissioning, the safe distance from the antenna is the greater of:

20cm

Or

r cm, where  $r = \sqrt{(PG/4\pi S)}$

P: power input to antenna(s) in mW

G: numeric gain of antenna relative to isotropic radiator

S: power density in mW/cm<sup>2</sup> = 0.5577 mW/cm<sup>2</sup> (from module calculation)

The safe distance from the antenna shall be the greater of:

20 cm or  $\sqrt{(PG/4\pi S)}$

### **FM3Gateway - simultaneous operation of GPRS and 802.15 radios**

The device is designed to be used at a distance of at least 20cm.

Worst case operation would be simultaneous transmission, and summing the powers gives the following equation:

$$r = \sqrt{((P_1 * G_1 + P_2 * G_2) / 4 * \pi * S)}$$

Where:

P<sub>1</sub> and G<sub>1</sub> are for GPRS modem and worst case is the 850 MHz:

- 850 MHz band, P\*G= 3177, using:
  - 2588 mW
  - 1.23 linear antenna gain (0.89 dBi)
- 1850 MHz band, P\*G = 2208 using
  - 1380 mW
  - 1.45 linear gain (1.6 dBi)

P<sub>2</sub> and G<sub>2</sub> are for the 802.15 modem: 6mW and 2.51 linear (4dBi)

So, safe distance

$$r = \sqrt{(((2286 * 1.23) + (6 * 2.51)) / (4 * 3.142 * 0.5577))}$$

$$r = 20.08 \text{ cm}$$

**So, 20.1 cm is a suitable safe distance**