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Maximum Permissable Exposure Calculations.

The following calculations are based on guidelines published in OET Bulletin 65, Edition 97-01, August 1997: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.

	Frequency (GHz)	Wavelength (m)	Near to Far Field Transition (cm)
Lower	2.4000	0.125	~2.0
Upper	2.4835	0.121	~1.9

For a simple case, discounting reflections, equation 3, page 19 gives:

Power Density, $S = PG / 4\pi R^2$

Worst case power input to antenna : 7.45 mW.

Antenna gain : 0 dBi.

Numeric antenna gain : 1.

General population/ uncontrolled limit: 1mW/cm².

Distance from antenna, R, where power density limit is reached is:

$R = \sqrt{(PG / 4\pi S)}$

$R = 0.77$ cm

Notes.

1. The maximum transmitter output power is that measured for FCC Part 15.247(b3).
2. The distance from the antenna, 20 cm, is taken from the minimum working distance quoted in the user manual, required by the FCC.
3. The general population/ uncontrolled limit is taken from OET 65, Appendix A Table 1B page 67.

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For a truly worst case prediction of power density, including reflections from nearby surfaces, OET 65 recommends using equation 6, page 20.

$$\text{Power Density } S = PG/\pi R^2$$

Using the same figures as above the distance from antenna, R, where power density limit is reached is:

$$R = \sqrt{PG/\pi S}$$

$$R = 1.54 \text{ cm.}$$

Mark Bailey

20/03/01

Red-M Ltd.