MPE Calculations

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure to 1mW/ cm^2 for systems operating in the 15.247 DTS. The distance, d(cm) from the antenna at which the power density, P_d (mW/cm^2) is below this limit is calculated from the maximum EIRP, P_t (mW) using the equation:

$$P_d = P_t/(4 \pi d^2)$$

Re-arranging for the distance at which the power density is $1mW/cm^2$ gives:

$$d = \sqrt{(P_t/(4 \pi))}$$

The device under test is designed to use antennas with maximum gains of 38.3dBi at an output power of 25.1 dBm (using output power listed on the original grant), giving an EIRP of 63.4 dBm (2188 W). Based on the highest EIRP for the system, the distance at which the power density meets the 1mW/ cm^2 limit for uncontrolled exposure is:

$$d = \sqrt{(2188 \times 10^3/(4 \pi))} = 417 \text{ cm}$$

The table below shows the separation distance required to meet the 1mW cm^2 limit for all antennas that are to be certified with this system.

Output Power dBm	Antenna Gain dBi	Antenna Type	EIRP dBm	MPE distance cm
25.1	38.3	6' dish	63.4	417
25.1	35.3	4' dish	60.4	295
25.1	31.2	3' dish	56.3	184
25.1	29.0	2' dish	54.1	143
25.1	25.3	1.5' dish	50.4	93
25.1	22.0	1' dish	47.1	64
25.1	23.0	Integral	48.1	72

Antenna gain is the highest gain for Radio Wave or Gabriel dish antennas of the diameter specified.

The user's manual contains an abbreviated version of this table to provide guidance as to the minimum separation distances required for the various antennas. The distances are equal to or greater than those in the table above.