MPE Calculations

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure to 1mW/ cm^2 for systems operating in the 2400-2483.5MHz band. 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/cm2 gives:

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

The device tested is designed to use various antenna with a gains of between 2dBi and 18dBi. The maximum output power across all channels is 17.7dBm. The attached document shows the calculated distance from each antenna that can be used with the device at which the rf exposure requirements are met. As the device is intended for mobile applications the minimum separation distance is always 20cm. The high gain patch antennas may be used with other, higher EIRP systems and so have separation distances greater then those required for use with the ME103.

The installation guide for the individual antennas and for the system detailed the minimum cable lengths to be used with each antenna and the minimum separation distances to meet the FCC's and Industry Canada's rf exposure requirements.

ME103 Output Power (Max)	Minimum Cable Length, ME103 to antenna	Cable Loss	Input Power to Antenna	Antenna Part #	Antenna type	Antenna Gain	EIRP (dBm)	EIRP (Watts)	MPE Distance (cm)	Antenna Installation Manual Separation Distance
17.7	0.0	0.0	17.7	JOYMAX IW-144	Omni	2.0	19.7	0.1	2.73	20cm
17.7	0.0	0.0	17.7	ANTENNIQUES MCS-003A	Omni	3.0	20.7	0.1	3.06	20cm
17.7	0.0	0.0	17.7	JOYMAX IW-152RS	Omni	4.0	21.7	0.1	3.43	20cm
17.7	0.0	0.0	17.7	SENAO NAS-T0405(N)	Omni TriBand	4.0	21.7	0.1	3.43	20cm
17.7	0.0	0.0	17.7	ANTENNIQUES MCS-004	Omni	5.0	22.7	0.2	3.85	20cm
17.7	0.0	0.0	17.7	SENAO NAS-2405(N)	Omni Stand	5.0	22.7	0.2	3.85	20cm
17.7	0.0	0.0	17.7	ANTENNIQUES MCS-004A	Omni	7.0	24.7	0.3	4.85	20cm
17.7	0.0	0.0	17.7	SENAO SAG-T0909	Omni TriBand	9.0	26.7	0.5	6.10	20cm
17.7	0.0	0.0	17.7	SENAO SAG-2409	Omni	9.0	26.7	0.5	6.10	20cm
17.7	0.0	0.0	17.7	SENAO NAP-2405(N)	Ceiling	5.0	22.7	0.2	3.85	20cm
17.7	1.5	1.4	16.3	SENAO SAP-2412	Patch	12.0	28.3	0.7	7.33	20cm
17.7	1.5	1.4	16.3	SENAO NAP-2418(N)	Patch	18.0	34.3	2.7	14.64	20cm