

MPE Calculations

The device is not a portable device (i.e. intended to be worn on the body or be hand-held), so it is classified as being either a mobile device or a fixed mounted device. The user's manual specifies a minimum separation distance of at least 20cm, consistent with this classification.

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure. The power density, P_d (mW/cm²) calculated from the maximum EIRP, P_t (mW) and the distance, d (m), between the transmitting antenna and the closest person, can be calculated using:

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

Frequency	MPE Limit (mW/cm ²)	Output Power (mW)	Max. Antenna Gain (dBi)	EIRP (mW)	Pd at 20cm (mW/cm ²)	Distance where Pd = limit (cm)
902 to 928 MHz	0.60	895.4	5.0	2831.4	0.56	19.4

The above table does not take into account the transmissions from Bluetooth device. The MPE¹ calculation for the Bluetooth device is shown below:

Frequency	MPE Limit (mW/cm ²)	Output Power (mW)	Max. Antenna Gain (dBi)	EIRP (mW)	Pd at 20cm (mW/cm ²)	Distance where Pd = limit (cm)
2402 to 2480 MHz	1.00	2.5	4.1	6.5	0.001	0.7

At 20cm from the device the contribution from the Bluetooth device is 0.1% of the limit for a 2.4 GHz device. The contribution from the 900 MHz transceiver is 93.3 % of its limit.

Therefore, at 20cm from the device the total contribution from both transceivers is 93.4% of the weighted limit and below the maximum permitted level for uncontrolled exposure.

¹ The calculation of the MPE from the Bluetooth device assumes a maximum output power from the module of 4dBm (manufacturer's specification) and the antenna gain of 4dBi. The actual gain of the antenna assembly, when positioned on the circuit board, is less than the antenna free-space measurements and so the calculation represents a conservative value.