

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.

The antenna gains are provided in the table below, with the highest gain in each band highlighted.

Antenna Name and model	Chain	Type	Antenna Gain			
			2.4GHz	5.2GHz	5.5GHz	5.7GHz
Universe Antenna						
	A	PIFA	3.24	3.73	4.77	4.97
	B	PIFA	3.24	3.73	4.77	4.97
	C	PIFA	3.24	3.73	4.77	4.97
Smart Approach Antenna						
SE-07200-EQQU8	A	PIFA	-0.88	1.58	0.21	-0.8
SE-07200-EQQU8	B	PIFA	1.06	1.26	0.23	-0.01
SE-07200-EQQU8	C	PIFA	-0.28	4.66	3.9	3.53

From the original test report, these are the maximum average powers on each chain in each band. Only the single chain cases are provided as, in multi-chain modes, the power per chains are lower therefore the total eirp is the same or lower than the worst-case single-chain mode. The highlighted values are the values that, when combined with the highest gain antenna from the previous table, result in the highest eirp value.

Chain	Operating Band				
	2400 MHz	5150 MHz	5250 MHz	5470 MHz	5725 MHz
A	16.5 dBm	16.7 dBm	16.6 dBm	16.7 dBm	16.6 dBm
B	16.6 dBm	16.7 dBm	16.5 dBm	16.6 dBm	16.6 dBm
C	16.6 dBm	16.7 dBm	16.7 dBm	16.8 dBm	16.6 dBm

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure. The power density, P_d (mW/cm^2) 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:

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

The power density at 20cm from the device has been calculated using the formula above for each operating band based on the highest eirp. The results are provided in the table on the following page, and all clearly demonstrate that the power density at a distance of 20cm from the device is below the limit for uncontrolled exposure.

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)
2400 to 2484 MHz	1.00	45.7	3.2	96.4	0.02	2.8
5150 to 5250 MHz	1.00	46.8	4.7	136.8	0.03	3.3
5250 to 5350 MHz	1.00	46.8	4.7	136.8	0.03	3.3
5470 to 5725 MHz	1.00	46.8	4.8	140.3	0.03	3.3
5725 to 5850 MHz	1.00	45.7	5.0	143.5	0.03	3.4