

## MPE Calculation

### Prediction of MPE limit at a given distance

For purposes of these requirements mobile devices are defined by the FCC as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between radiating structures and the body of the user or nearby persons. These devices are normally evaluated for exposure potential with relation to the MPE limits. As the 20 cm separation specified under FCC rules may not be achievable under normal operation of the EUT, an RF exposure calculation is needed to show the minimum distance required to be less than the power density limit, as required under FCC rules.

Equation from IEEE C95.1

$$S = \frac{EIRP}{4\pi R^2} \text{ re - arranged } R = \sqrt{\frac{EIRP}{S4\pi}}$$

Where:

S = power density

R = distance to the centre of radiation of the antenna

EIRP = EUT Maximum power

Result

Radio interface	Channel Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP		Power density limit (S) (mW/cm <sup>2</sup> )	Distance (R) cm required to be less than the power density limit
				dBm	W		
2.4 GHz BLE	2402	5.2	5	10.2	0.010	1.0	0.9
2.4 GHz Wi-Fi	2452	25.6	5	30.6	1.148	1.0	9.6
5.15-5.25 GHz Wi-Fi	5190	15.6	7.1	22.7	0.186	1.0	3.8
5.25-5.35 GHz Wi-Fi	5260	18.6	7.1	25.7	0.372	1.0	5.4
5.47-5.725 GHz Wi-Fi	5580	19.4	6.9	26.3	0.427	1.0	5.8
5.725-5.85 GHz Wi-Fi	5745	18.9	6.9	25.8	0.380	1.0	5.5