

MPE Calculation for FCC Uncontrolled Environment



Formula from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density
 P = power input to the antenna
 G = power gain of the antenna in the direction of interest relative to an isotropic radiator
 R = distance to the center of radiation of the antenna

Source Based Time Averaged Duty Cycle is 100% in calculation below

All Power values are Average Power

		Cellular Technology							
Mobile Technology:		2G		3G		4G			
Mobile Band:		B02	B05	B02	B05	B02	B05	B25	B26
Prediction frequency (MHz):		1950	880	1950	880	1950	880	1950	880
Maximum peak output power (dBm):		41.00	38.00	44.00	44.00	43.00	42.00	42.00	41.00
Maximum peak output (W):		12.59	6.31	25.12	25.12	19.95	15.85	15.85	12.59
Prediction distance (cm):		100	100	100	100	100	100	100	100
MPE limit at prediction frequency (W/m ²):		10.00	5.87	10.00	5.87	10.00	5.87	10.00	5.87
Power density at prediction frequency (W/m ²):		1.002	0.502	1.999	1.999	1.588	1.261	1.261	1.002
Maximum allowable antenna gain (dBi):		9.99	10.68	6.99	4.68	7.99	6.68	8.99	7.68
Ratio of Compliance (PD/MPE Limit)		0.10	0.09	0.20	0.34	0.16	0.21	0.13	0.17

		WiFi Module 1				WiFi Module 2	
		FCC ID: PD98265NG				FCC ID: RYK-WUBR508N	
		Ref Intel Test Report No 160321-01.TR05				REF MRT Test Report No 2005RSU029-U3	
		WiFi 2.4	WiFi 5G	BT	BLE	WiFi 2.4	WiFi 5G
Prediction frequency (MHz):		2400	5500	2400	2400	2400	5500
Maximum output power (dBm):		20.30	20.30	10.40	3.61	19.00	18.50
Maximum output power (W):		0.11	0.107	0.011	0.002	0.079	0.071
Prediction distance (cm):		20	20	20	20	20	20
MPE limit at prediction frequency (W/m ²):		10.00	10.00	10.00	10.00	10.00	10.00
Power density at prediction frequency (W/m ²):		0.213	0.213	0.022	0.005	0.158	0.141
Maximum allowable antenna gain (dBi):		16.71	16.71	26.61	33.40	18.01	18.51
Ratio of Compliance (PD/MPE Limit)		0.021	0.021	0.002	0.000	0.016	0.014

Worst Case:

3G B05: 0.341
 Module 1 WiFi 2.4 or 5 GHz: 0.021
 Module 1 WiFi 2.4 GHz: 0.016
Total Ratio of Compliance: 0.378

Antenna must be kept at least 60 cm away from any persons

Antennas must be at least 20 cm away from any persons

Requirement: Total Ratio of Compliance must be Less than 1

Verdict: Pass