

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	B02	B04	B02	B04	B10	B13	B14	B25	B30	B66	B71
Prediction frequency (MHz):	1950	1950	2130	1950	2130	2150	750	760	1950	2350	2140	635
Maximum peak output power (dBm):	42.00	42.00	43.00	41.00	41.00	43.00	38.00	30.00	42.00	27.00	42.00	42.00
Maximum peak output (W):	15.85	15.85	19.95	12.59	12.59	19.95	6.31	1.00	15.85	0.50	15.85	15.85
Prediction distance (cm):	100	100	100	100	100	100	100	100	100	100	100	100
MPE limit at prediction frequency (W/m^2):	10.00	10.00	10.00	10.00	10.00	10.00	5.00	5.07	10.00	10.00	10.00	4.23
Power density at prediction frequency (W/m^2):	1.261	1.261	1.588	1.002	1.002	1.588	0.502	0.080	1.261	0.040	1.261	1.261
Ratio of Compliance (PD/MPE Limit)	0.13	0.13	0.16	0.10	0.10	0.16	0.10	0.02	0.13	0.00	0.13	0.30

	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	
Ratio of Compliance (PD/MPE Limit)	0.021	0.021	0.002	0.000	0.016	0.014	

Worst Case:

LTE B71: 0.298

Module 1 WiFi 2.4 or 5 GHz: 0.021

Module 2 WiFi 2.4 GHz: 0.016

Total Ratio of Compliance: 0.335**Requirement: Total Ratio of Compliance must be Less than 1****Verdict: Pass**

Calculation assumes antenna is kept at least 100 cm away from any persons

Calculation assumes antenna is kept at least 20 cm away from any persons