

Prediction of MPE at a given distance

1. Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1310(e)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

2. Test Procedure

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

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

3. Result

Worse case is as below:

Mode	Frequency (MHz)	Prediction distance (cm)	RF output power		MPE (mW/cm ²)	Limit (mW/cm ²)	SAR Test Exclusion
			dBm	mW			
EDR	2441	50	8.783	7.5561	0.00024	1	Yes
2.4G WIFI	2437	50	17.544	56.8068	0.00181	1	Yes
5G WIFI B1	5210	50	16.395	43.6014	0.00139	1	Yes
5G WIFI B2	5775	50	15.78	37.8443	0.00120	1	Yes
UHF	410.050	50	30.677	1168.6918	0.05896	0.2733	Yes

Maximum Simultaneous transmission MPE Ratios for EDR+2.4G WIFI + UHF:

Max MPE ratio BT4.1/Limit	Max MPE ratio 2.4G WIFI/Limit	Max MPE ratio UHF/Limit	ΣMPE ratios	Limit	Result
0.00024	0.00181	0.2157	0.21775	1	PASS

BT&WIFI Antenna Gain: 0dBi, 1 (numeric)

UHF Antenna Gain: 2dBi, 1.58(numeric)

Then SAR evaluation is not required.