

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 1.1307(b)

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

RF output power	MAX.tune-uppower
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3. Result

Worse case is as below:

Mode	Frequency (MHz)	Prediction distance (cm)	RF output power	MAX tune-uppower		MPE (mW/cm ²)	Limit (mW/cm ²)	SAR Test Exclusion
			dBm	dBm	mW			
BT	2441	50	5.798	6	3.9811	0.0002	1	Yes
2.4G WiFi	2452	50	24.511	25	316.2278	0.0143	1	Yes
5G WIFI	5190	50	21.41	22	158.4893	0.0080	1	Yes
UHF	440	50	32.921	33	1995.2623	0.1595	0.304	Yes

Maximum Simultaneous transmission MPE Ratios for BT+WIFI + +UHF:

Max MPE ratio _{BT} /Limit	Max MPE ratio _{WIFI} /Limit	Max MPE ratio _{UHF} /Limit	ΣMPE ratios	Limit	Result
0.0002	0.0143	0.1595	0.174	1	PASS

BT&WIFI Antenna Gain: 1.51dBi, 1.42(numeric)

5G WIFI Antenna Gain: 2dBi, 1.58(numeric)

UHF Antenna Gain: 4dBi, 2.51(numeric)

Then SAR evaluation is not required.