

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

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			
2.4GWIFI	2437	20	14.966	31.376	0.011098	1	Yes

Mode	Frequency range	Maximum E-field strength (dB μ V/m)	Maximum E-field strength (V/m)	Limit (V/m)	Conclusion
NFC	13.56MHz	53.41	0.0005	61	PASS

Note 1: $V/m = 10^{((dB\mu V/m) - 120)/20}$

Maximum Simultaneous transmission MPE Ratios for 2.4G+NFC:

Max MPE ratio 2.4G/Limit	Max MPE ratio NFC/Limit	Σ MPE ratios	Limit	Result
0.011098	0.000008	0.011106	1	PASS

2.4G Antenna Gain: 2.499dBi, 1.78(numeric)

NFC Antenna Gain: 0dBi, 1(numeric)

Meet MPE requirements, then SAR evaluation is not required.