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)	MPE Test Exclusion
			dBm	mW			
EDR	2402	20	5.331	3.4127	0.00077	1	Yes
2.4GWIFI	2437	20	14.25	26.6073	0.00499	1	Yes
5GWIFI BAND1	5210	20	12.16	16.4437	0.00801	1	Yes
5GWIFI BAND4	5775	20	9.374	8.6576	0.00422	1	Yes
UHF	469.95	20	30.418	1101.0321	0.08821	0.3133	Yes

Maximum Simultaneous transmission MPE Ratios for EDR+2.4GWIFI+UHF:

Max MPE ratio $_{EDR}$/Limit	Max MPE ratio $_{WIFI}$/Limit	Max MPE ratio $_{UHF}$/Limit	∑MPE ratios	Limit	Result
0.00077	0.00801	0.00801	0.29033	1	PASS

EDR Antenna Gain: 0.56dBi, 1.14(numeric)

2.4GWIFI Antenna Gain: -0.26dBi, 0.94(numeric)

5GWIFI Antenna Gain: 3.89dBi, 2.45(numeric)

UHF Antenna Gain: -3.95dBi, 0.40(numeric)

Meet MPE requirements, RF Exposure evaluation is not required.