

## 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	SAR Test Exclusion
			dBm	dBm	mW			
BT	2480	50	5.076	6	3.9811	0.0002	1	Yes
BLE	2480	50	4.255	6	3.9811	0.0002	1	Yes
WIFI	2412	50	16.57	17	50.1187	0.0028	1	Yes
GSM850	848.8	50	32.31	33	1995.2623	0.0800	0.566	Yes
PCS1900	1909.8	50	29.29	31	1258.9254	0.0504	1	Yes
3G B V	836.6	50	25.25	26	398.1072	0.0160	0.558	Yes
3G B II	1852.4	50	23.40	25	316.2278	0.0127	1	Yes
3G B IV	1752.6	50	23.56	25	316.2278	0.0127	1	Yes
LTE B2	1880	50	24.81	26	398.1072	0.0160	1	Yes
LTE B4	1720	50	25.04	25	316.2278	0.0127	1	Yes
LTE B5	829	50	24.96	25	316.2278	0.0127	0.553	Yes
LTE B7	2510	50	24.72	25	316.2278	0.0127	1	Yes
LTE B12	707.5	50	24.64	25	316.2278	0.0127	1	Yes
LTE B41	2565	50	24.70	25	316.2278	0.0127	1	Yes
UHF	456.125	50	30.68	33	1995.2623	0.1595	0.304	Yes

Maximum Simultaneous transmission MPE Ratios for BT4.1+WIFI +GSM+UHF:

Max MPE ratio <sub>BT</sub> /Limit	Max MPE ratio <sub>WIFI</sub> /Limit	Max MPE ratio <sub>GSM</sub> /Limit	Max MPE ratio <sub>UHF</sub> /Limit	∑MPE ratios	Limit	Result
0.0002	0.0028	0.0800	0.1595	0.2425	1	PASS

BT&WIFI Antenna Gain: 2.5dBi, 1.78(numeric)

GSM, WCDMA & LTE Antenna Gain: 1dBi, 1.26(numeric)

UHF Antenna Gain: 4dBi, 2.51(numeric)

Then SAR evaluation is not required.