



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)

KDB Test Methodology: KDB 447498 D01 v06.

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

Mode	Frequency (MHz)	Prediction distance (cm)	RF output power(Max) (dBm)	Tune-up power (Max)		MPE (mW/cm ²)	Limit (mW/cm ²)	SAR Test Exclusion
				dBm	mW			
RF ID	905-920	20	29.89	30	1000.0000	0.2370	0.6033	Yes
BT LE	2402-2480	20	4.76	5	3.1623	0.0007	1.0000	Yes
2.4G WIFI	2412-2462	20	15.73	16	39.8107	0.0088	1.0000	Yes
GSM 850	824.2-848.8	20	30.98	31	1258.9254	0.2593	0.5494	Yes
PCS 1900	1850.2-1909.8	20	28.96	29	794.3282	0.1878	1.0000	Yes
WCDMA Band II	1852.4-1907.6	20	23.89	24	251.1886	0.0584	1.0000	Yes
WCDMA Band V	826.4-846.6	20	23.79	24	251.1886	0.0517	0.5509	Yes
LTE B2	1850~1910	20	23.92	24	251.1886	0.0584	1.0000	Yes
LTE B4	1710~1755	20	23.87	24	251.1886	0.0572	1.0000	Yes
LTE B5	824~849	20	23.86	24	251.1886	0.0517	0.5493	Yes
LTE B7	2500~2570	20	23.96	24	251.1886	0.0626	1.0000	Yes

BT:

Internal antenna 1, Maximum Gain is 0.45dBi.

Internal antenna 2, Maximum Gain is 0.45dBi.

2.4G WiFi:

Internal antenna, Maximum Gain is 0.45dBi.

RFID antenna:

Internal antenna, Maximum Gain is 0.76dBi.

GSM:

Internal antenna, Maximum Gain is 0.15dBi for GSM 850.

Internal antenna, Maximum Gain is 0.75dBi for PCS1900.

WCDMA:

Internal antenna, Maximum Gain is 0.68dBi for WCDMA Band II.

Internal antenna, Maximum Gain is 0.15dBi for WCDMA Band V.

LTE:

Internal antenna, Maximum Gain is 0.68dBi for LTE Band 2.

Internal antenna, Maximum Gain is 0.59dBi for LTE Band 4.

Internal antenna, Maximum Gain is 0.15dBi for LTE Band 5.

Internal antenna, Maximum Gain is 0.98dBi for LTE Band 7.



Maximum Simultaneous transmission MPE Ratios for BT+WIFI+RFID+WWAN

Max MPE Ratio BT/Limit	Max MPE ratio WIFI/Limit	Max MPE ratio RFID/Limit	Max MPE ratio WWAN/Limit	ΣMPE ratios	Limit	Result
0.0007/1	0.0088/1	0.2370/0.6033	0.2593/0.5494	BT+ WIFI+ RFID+WWAN	1	PASS
0.0007	0.0088	0.3928	0.4720	0.8743	1	PASS

Then SAR evaluation is not required.

