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

WCDMA850

Maximum peak output power at antenna input terminal:23.54 (dBm)
Maximum peak output power at antenna input terminal: 225.94 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 100 (%)
Prediction frequency: 824.2 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0317 (mW /cm^2)
Power density at prediction frequency: 0.317 (W/m^2)

Power density at a given distance is 0.0317<1 mW/cm^2

WCDMA1900

Maximum peak output power at antenna input terminal:23.59 (dBm)
Maximum peak output power at antenna input terminal: 228.56 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 100 (%)
Prediction frequency: 1907.6 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0320 (mW /cm^2)
Power density at prediction frequency: 0.320 (W/m^2)

Power density at a given distance is 0.0320<1 mW/cm^2

GSM850/GPRS850

Maximum peak output power at antenna input terminal:33.24 (dBm)
Maximum peak output power at antenna input terminal: 2108.63 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 12.5 (%)
Prediction frequency: 848.8 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0369 (mW /cm^2)
Power density at prediction frequency: 0.369 (W/m^2)

Power density at a given distance is 0.0369<1 mW/cm^2

GPRS850 2 slots

Maximum peak output power at antenna input terminal:31.54 (dBm)
Maximum peak output power at antenna input terminal: 1425.61 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 25 (%)
Prediction frequency: 848.8 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0499 (mW /cm^2)
Power density at prediction frequency: 0.499 (W/m^2)

Power density at a given distance is 0.0499<1 mW/cm^2

GPRS850 3 slots

Maximum peak output power at antenna input terminal:29.71 (dBm)
Maximum peak output power at antenna input terminal: 935.41 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 37.5 (%)
Prediction frequency: 848.8 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0492 (mW /cm^2)
Power density at prediction frequency: 0.492(W/m^2)

Power density at a given distance is 0.0492<1 mW/cm^2

GPRS850 4 slots

Maximum peak output power at antenna input terminal:28.67 (dBm)
Maximum peak output power at antenna input terminal: 736.21 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 50 (%)
Prediction frequency: 824.2 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0515 (mW /cm^2)
Power density at prediction frequency:0.515 (W/m^2)

Power density at a given distance is 0.0515<1 mW/cm^2

GSM1900/GPRS1900

Maximum peak output power at antenna input terminal:29.92 (dBm)
Maximum peak output power at antenna input terminal: 981.75 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 12.5 (%)
Prediction frequency: 1880 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0172 (mW /cm^2)
Power density at prediction frequency: 0.172 (W/m^2)

Power density at a given distance is 0.0172<1 mW/cm^2

GPRS1900 2 slots

Maximum peak output power at antenna input terminal:28.43 (dBm)
Maximum peak output power at antenna input terminal: 696.63 (mW)
Antenna gain(typical): 1.47 (dBi)
Maximum antenna gain: 1.40 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 25 (%)
Prediction frequency: 1909.8 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0244 (mW /cm^2)
Power density at prediction frequency: 0.244 (W/m^2)

Power density at a given distance is 0.0244<1 mW/cm^2

GPRS1900 3 slots

Maximum peak output power at antenna input terminal:26.53 (dBm)
Maximum peak output power at antenna input terminal: 449.78 (mW)
Antenna gain(typical): 2 (dBi)
Maximum antenna gain: 1.58 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 37.5 (%)
Prediction frequency: 1909.8 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0236 (mW /cm^2)
Power density at prediction frequency: 0.236(W/m^2)

Power density at a given distance is 0.0236<1 mW/cm^2

GPRS1900 4 slots

Maximum peak output power at antenna input terminal:25.35 (dBm)
Maximum peak output power at antenna input terminal: 342.77 (mW)
Antenna gain(typical): 1.47 (dBi)
Maximum antenna gain: 1.40 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 50 (%)
Prediction frequency: 1909.8 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0240 (mW /cm^2)
Power density at prediction frequency: 0.240 (W/m^2)

Power density at a given distance is 0.0240<1 mW/cm^2

WIFI

Maximum peak output power at antenna input terminal:17.35 (dBm)
Maximum peak output power at antenna input terminal: 54.33 (mW)
Antenna gain(typical): 4.5 (dBi)
Maximum antenna gain: 2.82 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 100 (%)
Prediction frequency: 2412 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.0135 (mW /cm^2)
Power density at prediction frequency: 0.135 (W/m^2)

Power density at a given distance is 0.0135<1 mW/cm^2

BT

Maximum peak output power at antenna input terminal:6.35 (dBm)
Maximum peak output power at antenna input terminal: 4.32 (mW)
Antenna gain(typical): 4.5 (dBi)
Maximum antenna gain: 2.82 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 100 (%)
Prediction frequency: 2480 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.001 (mW /cm^2)
Power density at prediction frequency: 0.01 (W/m^2)

Power density at a given distance is 0.001<1 mW/cm^2

UHF

Maximum peak output power at antenna input terminal:30.68 (dBm)
Maximum peak output power at antenna input terminal: 1169.50 (mW)
Antenna gain(typical): 2.15 (dBi)
Maximum antenna gain: 1.64 (numeric)
Prediction distance: 30 (cm)
Sourse Based Time Average Duty Cycle: 100 (%)
Prediction frequency: 406.1 (MHz)
MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)
Power density at prediction frequency: 0.1696 (mW /cm^2)
Power density at prediction frequency: 1.696 (W/m^2)

Power density at a given distance is 0.1696<1 mW/cm^2

Note: for this product, all transmitters can not be in a mode of simultaneous transmission, therefore, it is deemed to fulfill with the requirement without further consideration of simultaneous transmission.