

1.1 Applicable Standard

According to §1.1310 and §2.1091 (Mobile Devices) RF exposure calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Note: f= frequency in MHz

*= Plane-wave equivalent power density

1.2 MPE Prediction

Prediction of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

700 MHz Downlink (763 – 775 MHz)

Maximum peak output power at antenna input terminal (dBm): 29.84

Maximum peak output power at antenna input terminal (mW): 964

Prediction distance (cm):50

Prediction frequency (MHz):769

Antenna Gain, typical (dBi):11

Power density at predication frequency and distance (mW/cm²):0.386

MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.513

700 MHz Uplink (793 – 805 MHz)

Maximum peak output power at antenna input terminal (dBm): 29.34

Maximum peak output power at antenna input terminal (mW): 859

Prediction distance (cm):50

Prediction frequency (MHz):799

Antenna Gain, typical (dBi):2

Power density at predication frequency and distance (mW/cm²):0.043
MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.533

800 MHz Downlink (851 – 869 MHz)

Maximum peak output power at antenna input terminal (dBm): 28.42
Maximum peak output power at antenna input terminal (mW): 695
Prediction distance (cm):50
Prediction frequency (MHz):860
Antenna Gain, typical (dBi):11
Power density at predication frequency and distance (mW/cm²):0.279
MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.573

800 MHz Uplink (806 – 824 MHz)

Maximum peak output power at antenna input terminal (dBm): 28.03
Maximum peak output power at antenna input terminal (mW): 635
Prediction distance (cm):50
Prediction frequency (MHz):815
Antenna Gain, typical (dBi):2
Power density at predication frequency and distance (mW/cm²):0.03
MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.543

Test Result

For downlink, the outdoor antenna with 11dBi gain should have at least 50 cm prediction distance to meet the MPE limit, the highest power density level at 50 cm is 0.338 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm².

For uplink, the indoor antenna with 2dBi gain should have at least 50 cm prediction distance to meet the MPE limit, the highest power density level at 50 cm is 0.055 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm².