

RF Exposure Statement

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
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

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

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

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

3. RESULTS

3-1. GSM 850 BAND

Average Max output Power at antenna input terminal(dBm)	33.5
Average Max output Power at antenna input terminal(mW)	2238.721
Prediction distance (cm)	20.000
Prediction frequency (MHz)	824.200
Antenna Gain(peak) (dBi)	-3.250
Antenna Gain(numeric)	0.473
Power density at prediction frequency (mW/cm ²)	0.211
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	0.549

3-2. GSM 1900 BAND

Average Max output Power at antenna input terminal(dBm)	30.500
Average Max output Power at antenna input terminal(mW)	1122.018
Prediction distance (cm)	20.000
Prediction frequency (MHz)	1930.200
Antenna Gain(peak) (dBi)	1.260
Antenna Gain(numeric)	1.337
Power density at prediction frequency (mW/cm ²)	0.298
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.0000

3-3. WCDMA 850 BAND

Average Max output Power at antenna input terminal(dBm)	25.500
Average Max output Power at antenna input terminal(mW)	354.813
Prediction distance (cm)	20.000
Prediction frequency (MHz)	826.400
Antenna Gain(peak) (dBi)	-3.250
Antenna Gain(numeric)	0.473
Power density at prediction frequency (mW/cm ²)	0.033
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	0.551

3-4. WCDMA 1900 BAND

Average Max output Power at antenna input terminal(dBm)	25.500
Average Max output Power at antenna input terminal(mW)	354.813
Prediction distance (cm)	20.000
Prediction frequency (MHz)	1852.400
Antenna Gain(peak) (dBi)	1.260
Antenna Gain(numeric)	1.337
Power density at prediction frequency (mW/cm ²)	0.094
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.0000

3-5. WCDMA 1700 BAND

Average Max output Power at antenna input terminal(dBm)	25.500
Average Max output Power at antenna input terminal(mW)	354.813
Prediction distance (cm)	20.000
Prediction frequency (MHz)	1712.4
Antenna Gain(peak) (dBi)	-0.130
Antenna Gain(numeric)	0.971
Power density at prediction frequency (mW/cm ²)	0.069
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.0000

3-6. LTE BAND 2

Average Max output Power at antenna input terminal(dBm)	26.200
Average Max output Power at antenna input terminal(mW)	416.869
Prediction distance (cm)	20.000
Prediction frequency (MHz)	1850.700
Antenna Gain(peak) (dBi)	1.260
Antenna Gain(numeric)	1.337
Power density at prediction frequency (mW/cm ²)	0.111
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.0000

3-7. LTE BAND 5

Average Max output Power at antenna input terminal(dBm)	26.200
Average Max output Power at antenna input terminal(mW)	416.869
Prediction distance (cm)	20.000
Prediction frequency (MHz)	824.700
Antenna Gain(peak) (dBi)	-3.250
Antenna Gain(numeric)	0.473
Power density at prediction frequency (mW/cm ²)	0.039
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	0.550

3-8. LTE BAND 4

Average Max output Power at antenna input terminal(dBm)	26.200
Average Max output Power at antenna input terminal(mW)	416.869
Prediction distance (cm)	20.000
Prediction frequency (MHz)	1710.700
Antenna Gain(peak) (dBi)	-0.130
Antenna Gain(numeric)	0.971
Power density at prediction frequency (mW/cm ²)	0.080
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.0000

3-9. LTE BAND 17

Average Max output Power at antenna input terminal(dBm)	26.200
Average Max output Power at antenna input terminal(mW)	416.869
Prediction distance (cm)	20.000
Prediction frequency (MHz)	706.500
Antenna Gain(peak) (dBi)	-3.030
Antenna Gain(numeric)	0.498
Power density at prediction frequency (mW/cm ²)	0.041
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	0.471

3-10. LTE BAND 7

Average Max output Power at antenna input terminal(dBm)	26.200
Average Max output Power at antenna input terminal(mW)	416.869
Prediction distance (cm)	20.000
Prediction frequency (MHz)	2502.500
Antenna Gain(peak) (dBi)	-0.220
Antenna Gain(numeric)	0.951
Power density at prediction frequency (mW/cm ²)	0.079
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.0000

3-11. LTE BAND 12

Average Max output Power at antenna input terminal(dBm)	26.200
Average Max output Power at antenna input terminal(mW)	416.869
Prediction distance (cm)	20.000
Prediction frequency (MHz)	699.700
Antenna Gain(peak) (dBi)	-3.030
Antenna Gain(numeric)	0.498
Power density at prediction frequency (mW/cm ²)	0.041
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	0.466

3-12. BT LE

Average Max output Power at antenna input terminal(dBm)	0.000
Average Max output Power at antenna input terminal(mW)	1.0000
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	2402.00000
Antenna Gain(peak) (dBi)	4.03
Antenna Gain(numeric)	2.52930
Power density at prediction frequency (mW/cm ²)	0.000503
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-13. DTS (2.4GHz) 802.11 b BAND

Average Max output Power at antenna input terminal(dBm)	16.0000
Average Max output Power at antenna input terminal(mW)	39.811
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	2402.00000
Antenna Gain(Peak) (dBi)	7.10000
Antenna Gain(numeric)	5.12861
Power density at prediction frequency (mW/cm ²)	0.040619
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-14. DTS (2.4GHz) 802.11 g BAND

Average Max output Power at antenna input terminal(dBm)	14.0000
Average Max output Power at antenna input terminal(mW)	25.119
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	2412.00000
Antenna Gain(Peak) (dBi)	7.10000
Antenna Gain(numeric)	5.12861
Power density at prediction frequency (mW/cm ²)	0.025629
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-15. DTS (2.4GHz) 802.11n_20MHz BAND

Average Max output Power at antenna input terminal(dBm)	13.0000
Average Max output Power at antenna input terminal(mW)	19.953
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	2412.00000
Antenna Gain(Peak) (dBi)	7.10000
Antenna Gain(numeric)	5.12861
Power density at prediction frequency (mW/cm ²)	0.020358
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-16. DTS (2.4GHz) 802.11n_40MHz BAND

Average Max output Power at antenna input terminal(dBm)	13.0000
Average Max output Power at antenna input terminal(mW)	19.953
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	2412.00000
Antenna Gain(Peak) (dBi)	7.10000
Antenna Gain(numeric)	5.12861
Power density at prediction frequency (mW/cm ²)	0.020358
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

(UNIT 1 BAND)
3-17 802.11a (5180 ~5240)

Average Max output Power at antenna input terminal(dBm)	8.0000
Average Max output Power at antenna input terminal(mW)	6.310
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5150.00000
Antenna Gain(peak) (dBi)	7.89000
Antenna Gain(numeric)	6.15177
Power density at prediction frequency (mW/cm ²)	0.007722
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-18 802.11n 20MHz BW(5180 ~ 5240)

Average Max output Power at antenna input terminal(dBm)	6.0000
Average Max output Power at antenna input terminal(mW)	3.981
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5150.00000
Antenna Gain(peak) (dBi)	7.89000
Antenna Gain(numeric)	6.15177
Power density at prediction frequency (mW/cm ²)	0.004872
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-19 802.11n 40MHz BW (5190 ~ 5230)

Average Max output Power at antenna input terminal(dBm)	5.0000
Average Max output Power at antenna input terminal(mW)	3.162
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5190.00000
Antenna Gain(peak) (dBi)	7.89000
Antenna Gain(numeric)	6.15177
Power density at prediction frequency (mW/cm ²)	0.003870
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-20 802.11ac 20 MHz BW (5180 ~ 5240)

Average Max output Power at antenna input terminal(dBm)	4.0000
Average Max output Power at antenna input terminal(mW)	2.512
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5180.00000
Antenna Gain(peak) (dBi)	7.89000
Antenna Gain(numeric)	6.15177
Power density at prediction frequency (mW/cm ²)	0.003074
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-21 802.11ac_40MHz BW (5190~5230)

Average Max output Power at antenna input terminal(dBm)	3.0000
Average Max output Power at antenna input terminal(mW)	1.995
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5190.00000
Antenna Gain(peak) (dBi)	7.89000
Antenna Gain(numeric)	6.15177
Power density at prediction frequency (mW/cm ²)	0.002442
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-22 802.11ac_80MHz BW (5210)

Average Max output Power at antenna input terminal(dBm)	2.0000
Average Max output Power at antenna input terminal(mW)	1.585
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5210.00000
Antenna Gain(peak) (dBi)	7.89000
Antenna Gain(numeric)	6.15177
Power density at prediction frequency (mW/cm ²)	0.001940
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

(UNII 2A,UNII 2C)
3-23 802.11a (5260~5320) UNII 2A

Average Max output Power at antenna input terminal(dBm)	8.0000
Average Max output Power at antenna input terminal(mW)	6.310
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5260.00000
Antenna Gain(peak) (dBi)	7.51000
Antenna Gain(numeric)	5.63638
Power density at prediction frequency (mW/cm ²)	0.007075
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-24 802.11a (5500~5720) UNII 2C

Average Max output Power at antenna input terminal(dBm)	8.0000
Average Max output Power at antenna input terminal(mW)	6.310
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5500.00000
Antenna Gain(peak) (dBi)	7.64000
Antenna Gain(numeric)	5.80764
Power density at prediction frequency (mW/cm ²)	0.007290
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-25 802.11n_20MHz BW(5260 ~5320) UNII 2A

Average Max output Power at antenna input terminal(dBm)	6.0000
Average Max output Power at antenna input terminal(mW)	3.981
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5260.00000
Antenna Gain(peak) (dBi)	7.51000
Antenna Gain(numeric)	5.63638
Power density at prediction frequency (mW/cm ²)	0.004464
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-26 802.11n_20MHz BW(5500~5270) UNII 2C

Average Max output Power at antenna input terminal(dBm)	6.0000
Average Max output Power at antenna input terminal(mW)	3.981
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5500.00000
Antenna Gain(peak) (dBi)	7.64000
Antenna Gain(numeric)	5.80764
Power density at prediction frequency (mW/cm ²)	0.004600
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-27 802.11ac_20MHz BW(5260~5320) UNII 2A

Average Max output Power at antenna input terminal(dBm)	4.0000
Average Max output Power at antenna input terminal(mW)	2.512
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5260.00000
Antenna Gain(peak) (dBi)	7.51000
Antenna Gain(numeric)	5.63638
Power density at prediction frequency (mW/cm ²)	0.002817
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-28 802.11ac_20MHz BW(5500~5720) UNII 2C

Average Max output Power at antenna input terminal(dBm)	4.0000
Average Max output Power at antenna input terminal(mW)	2.512
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5500.00000
Antenna Gain(peak) (dBi)	7.64000
Antenna Gain(numeric)	5.80764
Power density at prediction frequency (mW/cm ²)	0.002902
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-29 802.11n_40MHz BW(5270~5310) UNII 2A

Average Max output Power at antenna input terminal(dBm)	5.0000
Average Max output Power at antenna input terminal(mW)	3.162
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5270.00000
Antenna Gain(peak) (dBi)	7.51000
Antenna Gain(numeric)	5.63638
Power density at prediction frequency (mW/cm ²)	0.003546
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-30 802.11n_40MHz BW(5510~5710) UNII 2C

Average Max output Power at antenna input terminal(dBm)	5.0000
Average Max output Power at antenna input terminal(mW)	3.162
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5510.00000
Antenna Gain(peak) (dBi)	7.64000
Antenna Gain(numeric)	5.80764
Power density at prediction frequency (mW/cm ²)	0.003654
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-31 802.11ac 40MHz BW(5270~5310) UNII 2A

Average Max output Power at antenna input terminal(dBm)	3.0000
Average Max output Power at antenna input terminal(mW)	1.995
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5270.00000
Antenna Gain(peak) (dBi)	7.51000
Antenna Gain(numeric)	5.63638
Power density at prediction frequency (mW/cm ²)	0.002237
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-32 802.11ac 40MHz BW(5510~5710) UNII 2C

Average Max output Power at antenna input terminal(dBm)	3.0000
Average Max output Power at antenna input terminal(mW)	1.995
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5510.00000
Antenna Gain(peak) (dBi)	7.64000
Antenna Gain(numeric)	5.80764
Power density at prediction frequency (mW/cm ²)	0.002305
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-33 802.11ac_80MHz BW(5290) UNII 2A

Average Max output Power at antenna input terminal(dBm)	2.0000
Average Max output Power at antenna input terminal(mW)	1.585
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5290.00000
Antenna Gain(peak) (dBi)	7.51000
Antenna Gain(numeric)	5.63638
Power density at prediction frequency (mW/cm ²)	0.001777
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-34 802.11ac_80MHz BW(5530~5690) UNII 2C

Average Max output Power at antenna input terminal(dBm)	2.0000
Average Max output Power at antenna input terminal(mW)	1.585
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5530.00000
Antenna Gain(peak) (dBi)	7.64000
Antenna Gain(numeric)	5.80764
Power density at prediction frequency (mW/cm ²)	0.001831
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

(UNII 3 BAND)**3-35 802.11a (5745 ~5825)**

Average Max output Power at antenna input terminal(dBm)	8.0000
Average Max output Power at antenna input terminal(mW)	6.310
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5745.00000
Antenna Gain(peak) (dBi)	7.77000
Antenna Gain(numeric)	5.98412
Power density at prediction frequency (mW/cm ²)	0.007512
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-36 802.11n 20MHz BW(5745 ~ 5825)

Average Max output Power at antenna input terminal(dBm)	6.0000
Average Max output Power at antenna input terminal(mW)	3.981
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5745.00000
Antenna Gain(peak) (dBi)	7.77000
Antenna Gain(numeric)	5.98412
Power density at prediction frequency (mW/cm ²)	0.004739
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-37 802.11n 40MHz BW (5755 ~ 5795)

Average Max output Power at antenna input terminal(dBm)	5.0000
Average Max output Power at antenna input terminal(mW)	3.162
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5755.00000
Antenna Gain(peak) (dBi)	7.77000
Antenna Gain(numeric)	5.98412
Power density at prediction frequency (mW/cm ²)	0.003765
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-38 802.11ac 20 MHz BW (5745 ~ 5825)

Average Max output Power at antenna input terminal(dBm)	4.0000
Average Max output Power at antenna input terminal(mW)	2.512
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5745.00000
Antenna Gain(peak) (dBi)	7.77000
Antenna Gain(numeric)	5.98412
Power density at prediction frequency (mW/cm ²)	0.002990
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-39 802.11ac 40MHz BW (5755~5795)

Average Max output Power at antenna input terminal(dBm)	3.0000
Average Max output Power at antenna input terminal(mW)	1.995
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5755.00000
Antenna Gain(peak) (dBi)	7.77000
Antenna Gain(numeric)	5.98412
Power density at prediction frequency (mW/cm ²)	0.002375
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

3-40 802.11ac 80MHz BW (5775)

Average Max output Power at antenna input terminal(dBm)	2.0000
Average Max output Power at antenna input terminal(mW)	1.585
Prediction distance (cm)	20.00000
Prediction frequency (MHz)	5775.00000
Antenna Gain(peak) (dBi)	7.77000
Antenna Gain(numeric)	5.98412
Power density at prediction frequency (mW/cm ²)	0.001887
MPE limit for uncontrolled exposure at prediction frequency (mW/cm ²)	1.00000

1. The power density level at 20 cm is **0.298 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at GSM 1900**
2. The power density level at 20 cm is **0.040619mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at DTS (2.4GHz)802.11b Band**

->Simultaneous MPE 20cm is $(0.298 / 1.0) + (0.040619 / 1.0) < 1$

* The Worst case GSM 1900: 30.5 dBm , DTS (2.4GHz)802.11b Band: 16 dBm is Highest Power